THE UNIVERSITY
OF ILLINOIS
LIBRARY

696.05
ME
V.43'

remote storage

Digitized by the Internet Archive
in 2018 with funding from
University of Illinois Urbana-Champaign Alternates

https://archive.org/details/metalworkerweekl431unse

THE METAL WORKER

VOLUME XLIII.

JANUARY TO JUNE, 1895.

NEW YORK:
DAVID WILLIAMS, PUBLISHER, 96-102 READE STREET.

1895.

69 610 5
11 E
V1 431 revolv
Storage

INDEX TO VOLUME XLIII.

Acetylene in domestic use, Exhibition of June 22, p 35
is made, How, Feb. 16, p 29
Accuracy, Jan. 19, p 33
Adams coffee pot, Juue 29, p 43
Aero water still, Juue 29, p 39
Air blast apparatus, Mar. 30, p 39
oven and broiler burner, Patent, Feb. 23, p 42
bound service, Mar. 23, p 33
supply, Iusufficient, Feb. 9, p 35
tight waste trap, Mar. 16, p 44
Weight of, Jan. 19, p 34
Alaska stove door haudles, New, Jan. 12, p 50
Alleutown, Pa., plumbers, Feb. 23, p 32
Allowance for iron pipe, Mar. 23, p 32
Alphabetical list brands American tin and terne plates, Jan. 5, p 43
Aluminum alloys, Resistance to corrosion of some light, Jan. 19, p 54
coffee pot, Erie cast, May 25, p 41
egg cookers, Pure, Juue 29, p 40
Experiments with, May 11, p 33
Hardening of, Mar. 23, p 42
Soldering, June 15, p 31; 22, p 29
Some new uses of, June 15, p 56
Amendments to constitution, May 18, p 31
American industrial union, May 4, p 27
kitchens, Some, Mar. 9, p 29
tin plate lists, Our, Jan. 5, p 29
Angle lamp, June 8, p 40
Anti-freezing mortar, Feb. 16, p 31; Mar. 2, p 33
Apartment house fires, Apr 20, p 33
Apparatus, Air-blast, Mar. 30, p 39
Applicatiou of Acetylene, Feb. 16, p 29
Apportioning radiation, June 1, p 36
Apprenticeship, Feb. 9, p 48
code, Chicago, Mar. 9, p 45
Aqua retort heater, June 29, p 48
Arcade mop holder, May 4, p 41
Are gravel roofs durable? Feb. 16, p 31; Mar. 2, p 32; 23, p 35; 30, p 32
Argon, May 18, p 49
Armstrong pipe threading and cutting-off machine No. 2½, Jan. 12, p 36
Arrangement of hardware store, Mar. 9, p 32
Art for the artisan, June 1, p 23
of display, Feb. 9, p 39
Artesian well pressure, Utilizing, Feb. 16, p 30
Artist-artisan institute, May 11, p 25
Asbestos paper, Paste for, Mar. 2, p 32; 16, p 37; Apr. 6, p 32; 20, p 36
torch, June 1, p 39
Ash bag system in New York city, Apr. 27, p 33
Asphalt floors, June 29, p 33
Association news, Feb. 23, p 33; Mar. 2, p 41
Associations, New, Jan. 5, p 39
Atlanta Exposition, June 1, p 35
Australia, Manual iustruction in, May 4, p 39
Automatic damper regulator, Mar. 16, p 35
expansion tank, Jan. 12, p 37
B. & W. skate sharpener, Jan. 12, p 48
Babette seat, Feb. 9, p 48
Badge, New York trade school, Apr. 13, p 38
Baird snow guard, Feb. 23, p 39
tilting tumbliug barrel, Feb. 2, p 43
Baking pan, Round loaf, Jan. 12, p 47
Ball cock, Bostou safety, Jan. 26, p 47
Barker's chimney top aud ventilator, Feb. 9, p 35
Barn, Ventilating, Mar. 16, p 34
Barrel, Baird, tilting tumbling, Feb. 2, p 43
Bartlett's thermograph, Apr. 27, p 54
Base burning stoves, Jan. 12, p 40
Basin Clamp, Sherman's, Mar. 16, p 50
waste and plug, Hale, Feb. 9, p 50
Bath and lavatory, Golden crowu combination, May 25, p 32
fixture, Morrison's, June 22, p 33
heater, Little wonder gas, Apr. 13, p 43
Universal, Apr. 13, p 44
Puritau, Jan. 26, p 46
Bathroom, Pompeiian, Jan. 19, p 33
Bathtub, Copper. Feb. 16, p 34
Hardwood, Mar. 16, p 49
Battery for electric door opener, May 4, p 28
Bell trouble, Electric, Feb. 16, p 30
Belmont water closet with seat attachment, June 22, p 30
Benefits from organization, Jan. 19, p 37
Bennett's hardware shelf box, Apr. 20, p 47
Berger Bros., Mar. 23, p 48
gutter hangers, June 1, p 30
Mfg. Company, May 18, p 34
Best way to calk joints, Apr. 13, p 43
Beveling elbow, Pattern for, Apr. 6, p 45
Bids on heating, Feb. 2, p 33
Bigley's patent hot water heater, Apr. 13, p 37
Bind *The Metal Worker*, How to, Mar. 16, p 35
Bishop's ceiling plate, Apr. 6, p 41
Black iron tinning, June 29, p 32
plate mills, Mar. 9, p 42
sheet imports, Tin plate and, Apr. 6, p 37
Bliss deep throat power press, Mar. 16, p 53
Blow at eight-hour laws, Mar. 23, p 27
Blower specificatious, Mar. 2, p 36
Blue prints, Making, May 11, p 26
Boat builder's steam box, Jan. 26, p 35
Boiler, How to make, Apr. 6, p 33
Ideal steam, Apr. 20, p 44
Invincible, Apr. 6, p 40
Mahony vertical sectiou steam or water, Mar. 2, p 36
maker's bending rolls, June 8, p 36
Mending, Mar. 30, p 32
Pompeiian, Feb. 9, p 43
siphons, Mar. 30, p 34
United States, Feb. 23, p 36
Boilers, New Englaud aud excelsior coil, May 25, p 31
Boomerang, June 1, p 37
Born Steel & Range Mfg. Company, May 11, p 50
Boston safety ball cock, Jan. 26, p 47
Bottom tuyere, Feb. 2, p 52
Boxing and cartage, Charge for, Apr. 13, p 36
Brake, Range and safe makers open end hand, May 25, p 40
Bramhall Deane Company, June 29, p 49
Brand Stove Company, June 29, p 48
Brand's catalogues, Mar. 16, p 55
Brass, Brazing cast, Jan. 26, p 34
Coloring, Feb. 23, p 31
lists, Recent revisions in, Jan. 5, p 57
Bray pipe hanger, May 11, p 31
Braziug, May 25, p 26
cast brass, Jan. 26, p 34
Bread knife, Christy, model No. 16, May 4, p 41
Brightening future, Jau. 12, p 31
British tiu plate exports in 1894, Jau. 26, p 50
plates in 1894, Jan. 19, p 48
Brown's tea and coffee urn, Feb. 9, p 38
water still, Feb. 16, p 42
Bryant's lightning mixer and egg beater, June 29, p 42
Building contracts, Sub-letting in, Mar. 16, p 45
Evolution of an old, Feb. 9, p 36
operations in 1894, Feb. 2, p 48
trades exhibitiou, Feb. 2, p 33
Burner for cook stove or range, Gasoliue, Feb. 23, p 31
Improved B. & H., June 22, p 47
King Grip, May 4, p 41
New oil, Feb. 23, p 46
Patent air blast oven and broiler, Feb. 23, p 42
Business mortality iu 1894, Jan. 5, p 29
Buyer, Educate the, Apr. 6, p 31
Buzzacott's camp cooking outfit, June 22, p 45
California ordinance, May 25, p 32
stoves, Jan. 19, p 50
Calk joints, Best way to, Apr. 13, p 43; May 4, p 39
Camp cooking outfit, Buzzacott's, June 22, p 45
equipments, Folding, Apr. 20, p 35; 27, p 34
Can boss to fit around faucet, Patterns for, June 8, p 30
opener and cover, Eclipse, Jan. 12, p 47
carpet tacks, Apr. 13, p 47
openers, New, Feb. 2, p 50
top wanted, Feb 16, p 31
Canadiau customs decisions, May 4, p 49
nickel mines, June 22, p 50
steam heating, Apr. 6, p 42
Canners and tinners, Feb. 2, p 46
Capital and confideuce, Mar. 23, p 51
Carpet tacks, Can opener, Apr. 13, p 47
Carton boilers, Mar. 16, p 38
Cast iron, Soldering with, May 25, p 33
or vitrified pipe, May 4, p 34
Casting statuettes, June 8, p 29; 22, p 28
Ceiliug panel plate with enriched ceuter, Jan. 19, p 46
plate, Bishop's, Apr. 6, p 41
Columbia, Jau. 12, p 37
Sheet metal, Apr. 13, p 41
Ceilings, Sheet metal, Apr. 20, p 48
Cement for marble and basins, Wauts, Mar. 9, p 30; 23, p 32; Apr. 13, p 33
Central Stamping Company, May 18, p 42
supply association, Mar. 16, p 49
Cesspool, Well and, Apr. 13, p 33
Champion roaster or oven, Mar. 23, p 43
steel range, June 8, p 41
tin scrap, bailing press, May 4, p 30
water heater, Apr. 27, p 38

Changes in list prices granite ironware, Jan. 12, p 54
Charge for boxing and cartage, Apr. 13, p 38
Chautauqua eave trough hanger, Apr. 6, p 48
Check valve on boiler supply, June 1, p 24
Chicago apprenticeship code, Mar. 9, p 45
drainage canal, Feb. 9, p 52
stove trade, Feb. 16, p 47; May 25, p 43
Chimney heat, Economizing, June 29, p 32
top and ventilator, Barker's, Feb. 9, p 35
sweats, Feb. 9, p 35
Chimneys, Feb. 23, p 29
of large buildings, Sweeping, May 25, p 28
Choked water backs, Jan. 12, p 40
Christy model No. 16, bread knife, May 4, p 41
Church heating plants, Mar. 30, p 31
Cider press, Davidson's electric, Jan. 12, p 48
Circle, Squaring the, Jan. 19, p 34; Feb. 2 p 34
Circuit hot water job, Mar. 16, p 40
system of hot water heating, Jan. 12, p 36, Mar. 23, p 37; Apr. 13, p 36
Circulate? Will it, Jan. 26, p 34; Feb. 23, p 31; Mar. 16, p 34
Circulation, Pressure and, Feb. 2, p 35
Cistern or wells, Iron platforms for, Mar. 23. p 43
water, Purifying, Feb. 2, p 34; 16, p 31
City farming, May 4, p 27; 11, p 26
Clamp and testing cover, S. & G., Jan. 26, p 46
Clark Stove Company, Feb. 2, p 53
Clarke's instantaneous water heater, Mar. 2, p 41
Class, Lead burning, Jan. 12, p 33
Cleaning solder, Mar. 30, p 36
zinc, Feb. 16, p 31
Cleats for tin roof, Apr. 20, p 36
Cleveland Co-operative Stove Company, June 22, p 48
Close trade school season, Apr. 6, p 31
Closet connection, Salvage, Mar. 9, p 46
Defender ventilating siphon, May 25, p 34
fixtures, High grade, Mar. 2, p 42
Maelstrom siphon, Jan. 12, p 34
Sanitas crown, Apr. 13, p 43
with hidden tank, Wash down, Apr. 20, p 37
Cloth holder, Barker's, June 22, p 43
Clothes horse, Eureka, Apr. 13, p 48
Coal mining situation, Jan. 5, p 45
tongs, Perfection, June 22, p 47
Coffee mill, Griswold, May 4, p 41
pot, Adams, June 29, p 43
Coil, Heating from, Feb. 9, p 40
Cold air box and filter, Mar. 9, p 30
Patterns for, June 8, p 30
duct, Feb. 3, p 34; 16, p 30; Mar. 2, p 33
Inside, Mar. 16, p 36; 30, p 33; Apr. 20, p 34
Cold water Oil Stove Company, Jan. 12, p 49
Cold weather casualties, Mar. 16, p 33
Collapse? Why did it, Mar. 9, p 30
Collapsed, with vacuum valve, Mar. 16, p 37; 30, p 33; Apr. 13, p 32
Collars in furnace, How to put, Apr. 6, p 33; 27, p 36
Coloring brass, Feb. 23, p 31
Columbia ceiling plate, Jan. 12, p 37
pipe hanger, Jan. 19, p 41
wiping cloth, Jan. 19, p 36
Columbus soap cup, Mar. 16, p 50
Combination heating, May 25, p 29
III, Feb. 9, p 40; IV, Mar. 9, p 34
pipe vise, Jan. 19, p 35
system, Unusual, Mar. 30, p 40
Combined flour bin and sifter, Apr. 13, p 49
scoop and scale, Feb 2, p 49
Combined tin plate shear and doubler, Feb. 23, p 43
Comet lawn sprinkler, Mar. 2, p 35
Common sense dust inhibitor, Apr. 27, p 35
Competition, May 25, p 25
Way to meet, Apr. 6, p 31
Computing heating surface, April 13, p 32
Condensation under iron roof, Jan. 19, p 34
Conductor heads, II, Feb. 2, p 42; III, Mar. 9, p 39; IV, June 1, p 28
pipe manufacturers, Eave trough and, Jan. 12, p 43
Connecticut State plumbers, Feb 9, p 47
Connecticut's proposed plumbing law, Jan. 19, p 39
Connecting fixtures, May 25, p 33
Connection? Who should make the, June 22, p 28; 29, p 33
Consolidation, Vapor stove, Jan. 5, p 51
Construction, Detail of, Mar. 30, p 33
Consumption of gas for heating, Feb. 23, p 46
Contract, Uniform, Feb. 23, p 37
Convention, After the, Feb. 2, p 41
aftermath, June 22. p 42
gossip, Apr. 27, p 39; May 4, p 34; June 8, p 44
hotel and railroad rates, May 11, p 30
master fitters, June 15, p 46
Next, Jan. 26, p 46
of heating engineers, Jan. 26, p 33
master fitters, June 22, p 40
steam and hot water fitters' association, May 11, p 39
Conventions, June, June 8, p 27
Conveyor, Pattern for, Mar. 23, p 33
Cooker, Wolff, Mar. 30, p 49
Cooking, Electric, Mar. 30, p 52
Gas for, Feb. 23, p 46
Co-operative trading in Great Britain, Mar. 2, p 31
Copper bathtub, Feb. 16, p 34
tank lining, Holes in, Apr. 6, p 32; 20, p 36
Tower work in, Mar. 30, p 44
work, Specimen of fine, Jan. 19, p 47
Corn popper, Quincy, June 22, p 45
Cornell steam heater, Apr. 27 p 42
Cornice trade, Roofing and, Jan. 5, p 31
Correction, A, Feb. 2, p 47
Corrosion of some light aluminum alloys, Resistance to, Jan. 19, p 54
Corrugated iron tables, June 8, p 38
Cost formula, May 11, p 43
Couplers on supply pipes, Star, Mar. 9, p 46
Covers for coffee pots, Rimmed, Mar. 9, p 32
Covert snaps, Mar. 9, p 33
Crazy water whip, Apr. 13 p 48
Cream city mug, May 18, p 28
Crescent automatic spray and force pumps, Mar. 16, p 43
Crosby gang slitting machine, June 8, p 49
Cross lock seamer, Niagara, May 11, p 36
Cupola tuyeres, III, Jan. 26, p 52; IV, Feb. 2, p 52; V, 16, p 48; VI, Mar. 23, p 53
Curling iron heater, Spirit stove and, June 22, p 46
Curved molding machine, Foot-power, May 11, p 34
Customs decisions, Canadian, May 4, p 49
Cut prices on stoves, Feb. 23, p 45
Daisy mincing knives, Jan. 26, p 44
Damper and damper clip, American, June 1, p 42
Devore's, June 1, p 42
regulator, Automatic, Mar. 16, p 35
U. S. A. stove pipe, June 1, p 41
Davidson's electric cider press, Jan. 12, p 48
Day classes at New York trade school, Feb. 9, p 46
Dealers along Hudson River, Stove and hardware, Mar. 23, p 44
Death of secretary Thomas, Feb. 23, p 54
Debs decision, June 8, p 27
Decimal sheet metal gauge, Jan. 5, p 53
Defender ventilating siphon closet, May 25, p 34
Defense Association meeting, May 4, p 43
Delaware basins, Wade's, Apr. 20, p 38
plug basin, Apr. 13, p 45
Denver plumbers, Apr. 20, p 37
Detail of construction, Mar. 30, p 33
Determining heating power of heating systems, Jan. 26, p 40; Feb. 16, p 37
Detroit florin washer, Apr. 20, p 46
Diagonal raking bracket under hipped roof, Pattern for, Apr. 27, p 48
Die stock, Oster adjustable ratcher, Apr. 20, p 45
Dietz crystal lantern, Jan. 19, p 44
tubular mill lantern, Jan. 12, p 47
Dimensions of small treadle lathe, Feb. 9, p 50
of ventilators, June 29, p 33
Dining room refrigerator, Jan. 12, p 47
Dinners, Ten-cent, Apr. 27, p 33
Direct hot water connection, Feb. 23, p 31
Disease germs, June 29, p 31
Dish drainer, Magic, Apr. 13, p 47
Displacing planished iron for locomotive jackets, Mar. 23, p 27
Display, Art of, Feb. 9, p 39
Dispute as to sizes, Apr. 20, p 36
Dissatisfied ones, Some, June 15, p 29
Distribution of tin plate imports, Feb. 16, p 44
Dominion master plumbers, Apr. 20, p 38
Door opener, Battery for electric, May 4, p 28
Quick meal balanced, Mar. 30, p 38
Double furnaces, Jan. 12, p 40
seaming machine, May 11, p 41
Douglas rubber elbow, Mar. 16, p 48
Dowagiac restores wages, Apr. 20, p 52
Wage question at, Apr. 27, p 56
Drain pipe, Connecting, June 1. p 26
Drainage canal, Chicago, Feb. 9, p 52
inspection, House, Feb. 2, p 44
Draining plumbing systems, Mar. 16, p 48; Apr. 6, p 34
Drawing board with profile slate, Hang up, June 29, p 34
tables, Designs for, May 11, p 27
Drift cityward, Feb. 23, p 27
Drilling attachment, S. & W., Mar. 16, p 52
Dripping pan corners, Apr. 27, p 36; May 18, p 25; 25, p 27
Driven wells, Feb. 9, p 34
Duct. Cold air, Feb. 2, p 34; 16, p 30; Mar 2, p 33
Duffy-Trowbridge Stove Mfg. Company, June 1, p 43
Dump cart, Odorless steel sanitary, Jan. 19, p 35
Dust inhibitor, Common sense, April 27, p 35
pan, West's, Mar. 23, p 43
East side chat, More, May 4, p 46
New York, Mar. 2, p 49
East Indian trade school, June 1, p 27
Eastern Supply Association, Mar. 16, p 49
Eastwood valve, Feb. 23, p 37
Eave trough and conductor pipe manufacturers, Jan. 12, p 43
hanger, Chautauqua, Apr. 6, p 48
troughs and conductors, Sheet zinc for, June 8, p 28; 22, p 29; 29, p 33
Echoes of stove convention, May 11, p 46
Eclipse can opener and cover, Jan. 12, p 47
gas stove, Mar. 9, p 33
lawn sprinkler, Jan. 26, p 44
refrigerator, June 1, p 39
Economizing chimney heat, June 8, p 28
Economy in division of labor, June 15, p 29
Editorials, Jan. 5, p 29; 12, p 31; 19, p 33; 26, p 33; Feb. 2, p 33; 9, p 33; 16 p 29; 23 p 29; Mar. 2, p 31; 9, p 29; 16, p 33; 23, p 27; 30, p 31; Apr. 6, p 31; 13, p 31; 20, p 33; 27, p 33; May 4, p 27; 11, p 25; 18, p 23; 25, p 25; June 1, p 23; 8, p 27; 15, p 29; 22, p 27; 29, p 31
Educate the buyer, Apr. 6, 31
Egg cookers, Pure aluminum, June 29, p 40
Eight-hour laws, Blow at, Mar. 23, p 27

Ejector, Niagara, Mar. 30, p 35
Elbow in tapering pipe, Apr. 20, p 36
pattern, Mar 23, p 32
Electric bell trouble, Feb. 16, p 30
cooking, Mar. 30, p 52
fans for heating purposes, Feb. 2, p 41
heating at vandeville theatre, Apr. 6, p 41
Electrically caused fires, June 15, p 31
Electricity, Heating water by, Feb. 16, p 31
Thawing frozen pipes with, Mar. 30, p 36
Empire spraying pumps, Feb. 16, p 41
Employment of labor, Jan. 12, p 31
Enameled ware, New, Feb. 16, p 42
well points, May 25, p 28
Enameling gasoline stoves, Feb. 16, p. 31; Mar. 2, p 33
End of strike, Mar. 30, p 31
Engineer, The heating and ventilating—a commercial view, Jan. 26, p 42
Problem for, Mar. 9, p 36
Engineer's education wanted, Mar. 30, p 33
Heating and ventilating, Jan. 12, p 38
English and American labor contrasted, June 1, p 31
Enriched center, Ceiling panel plate with, Jan. 19, p 46
Enterprise raisin seeder, Mar. 16, p 43
Equivalent balance, May 18, p 27
Erie cast aluminum coffee pot, May 25, p 41
Essay committee, Report of, Mar. 30, p 37
Essays at plumbers' conventions, Apr. 6, p 34
Estimating labor on pipe fitting contracts, Feb. 9, p 35
Eureka clothes horse, Apr. 13, p 48
self-measuring oil tank, June 8, p 42
Evans hot air furnace, Jan. 5, p 30; 26, p 34
protective milk can, Mar. 16, p 44
Evolution of an old building, Feb. 9, p 36
Example of faulty plumbing, Feb. 16, p 32
Excursion on Delaware, June 15, p 44
Exhaust steam and live steam reduced to low pressure, either separately or in combination, Heating and drying by use of, Feb. 2, p 36
heating, Apr. 27, p 44
Exhibition of appliances, June 29, p 43
Expansion bolt, Cook's, June 22, p 36
of metals, May 18, p 24
tank, Anti-waste, June 8, p 33
Automatic, Jan. 12, p 37
Vauderman's, Apr. 13, p 37
Experiments with sheet aluminum, May 11, p 33
Explosions, Kitchen boiler, Apr. 13, p 44
Extending heating system, May 25, p 26
Extra heavy gap shear, Jan. 12, p 42
Ezy raisin seeder, June 29, p 43
Fan and furnace, June 22, p 28
Fans for heating purposes, Electric, Feb 2, p 41
Faulty arrangement of piping, Feb. 9, p 34
Ferris, Out-ferrising, May 25, p 37
Few hopeful indications, Apr. 6, p 36
Fiber ware pails, Truss boom for, May 4, p 40
Standard, Mar. 2, p 35
Field triumph filters, Apr. 27, p 53
Filling tank, June 1, p 26
Filter, Cold air box and, Mar. 9, p 30
Gate City drip stone faucet, Apr. 13, p 47
Ideal water, Mar. 16, p 44
Filters, Field Triumph, Apr. 27, p 53
Finance and other matters, Jan. 5, p 29
Finish for slate roof at ridge and hip, Mar. 16, p 46; 23, p 34
Fire caused by radiator, Feb. 9, p 43
extinguisher, Guardian, Mar. 30, p 48
lighter, New, June 15, p 56
losses in Indiana gas belt, Apr. 13, p 40
place, Popular hot water, Mar. 2, p 37
pot coil, Making, Apr. 20, p 36; May, 4, p 28
Fire pot No. 4, Apr. 13, p 46
proof material, Test of, Jan. 12, p 32
First annual convention American society heating and ventilating engineers, Jan. 26, p 36
Fitters' association, National, Jan. 5, p 39
Convention Master, June 15, p 46
Fittings, June 15, p 50
Fixtures, Open work, Mar. 30, p 35
Flashings, Jan.5, p 32; 12, p 44; 19, p 46; Feb. 2, p 43; 9, p 37; 16, p 39; 23 p 39; Mar. 2, p 51; 9, p 41; 16, p 47; 23, p 48; 30, p 46; Apr. 6, p 48; 13, p 41; 20, p 48; 27, p 50; May 4, p 38; 11, p 36; 18, p 34; 25, p 48; June 1, p 30; 8, p 39; 22, p 36; 29, p 35
Floor tile setting, June 15, p 31
Flooring, Wood block, Jan. 26, p 55
Florida as market for heating stoves, Mar. 16, p 55
steam boiler, New surface, May 18, p 41
Flour bin and sifter, Combined, Apr. 13, p 49
Flueless stoves in confined rooms, Use of, June 1, p 44
Fluted cone, Pattern for, Jan. 19, p 34
Flux for soldering zinc, Jan. 19, p 35; 26, p 34
Fly killer and display stand, Wire broom, May 18, p 28
Folding camp equipments, Apr. 20, p 35; 27, p 34
Folsom's new model roof snow guard, Mar. 9, p 40
Foot bath, Stephenson's portable, June 22, p 32
Foreman plumber, May 18, p 31
Formula for hot water piping, Mar. 23, p 38
Foundry cost, May 11, p 47
Cupolas, Natural gas in, Mar. 16, p 33
mixtures for stove castings, Mar. 16, p 55; 30, p 50
Fount, Rochester, Mammoth, Feb. 16, p 41
Four-wheel pipe cutter, Mar. 2, p 44
Freight rates, Southern, Feb. 16, p 37
French schemes, Some wonderful, Jan. 26, p 43
Frozen windmill tanks, Mar. 2, p 32; 9, p 30
Frustum of cone intersecting cylinder, Pattern of, Jan. 19, p 53
Furnace and range association,. May 18, p 46
association acceded, Mar. 30, p 51
Balky, Apr. 20, p 36; 27, p 36; May 4, p 28; 11, p 26; 18, p 24
Canners and tinners, Feb. 2, p 46; 23, p 30; Mar. 16, p 37
Evans hot air, Jan. 5, p 30; 26, p 34
experience, Peculiar, Mar. 9, p 31; 16, p 37; 23, p 34; 30, p 34; Apr. 13, p 32; 27, p 36
Few remarks on ventilating and cold air supply for hot air, Mar. 9, p 30
fittings, Mar. 23, p 51
Gas soldering iron, Mar. 2, p 52
Gasoline melting, Apr. 13, p 40
Globe soldering, Feb. 23, p 41
heating with fan, May 25, p 44; June 1, p 25
Henric improved plumbers' and tinners' soldering, Mar. 16, p 48
Hot blast braziers', Jan. 26, p 44
How to put collars in, Apr. 6, p 33; 27, p 36
Improved hot air, May 18, p 30
Jupiter hot air, June 29, p 47
makers', Suggestions to, Apr. 20, p 51
Mammoth tubular, May 4, p 39
Trouble with, Mar. 2, p 33; 23, p 32; 30, p 34
Mismanaged. Apr. 6, p 32
New roofers' and tinners', Jan. 5, p 32
pipe rule, Feb. 2, p 35; Mar. 23, p 35
pipe? Will it pay to cover, May 4, p 29
text-book, May 4, p 45
Furnace tops? Which is best for, Mar. 2, p 33; 16, p 37; 23, p 34; 30, p 34; Apr. 6, p 33
trade, Apr. 6, p 51
Furnaces, Double, Jan. 12, p 40
from New York State and its effects on heating stove trade, Manufacture and sale of warm air, Mar. 9, p 48
in Syracuse, Manufacture of, Mar. 23, p 33
Future tinners, Jan. 26, p 33
Gallon, Size of, Feb. 9, p 34
Galvanized iron, Stained, Mar. 23, p 33
Trouble with, June 8, p 29
pump curb and tubing, Apr. 13, p 49
castings, Jan. 5, p 30
Garbage can, Sanitary, June 8, p 41
Carbonizer. Household, May 25, p 42
Gas burners, New regulator for welsbach lamp and other, June 22, p 34
fitters' wrench, Trimo, Feb. 23, p 33
fixture, Unique, Mar. 30, p 36
for cooking, Feb. 23, p 46
generator and burner, Peerless, June 29, p 46
heater, Novel, May 25, p 41
Heating of greenhouses by,Jan. 19, p 41
hot plates, Apr. 6, p 53
iron, Self-heating, June 22, p 46
lamp and stove, Zimer, Apr. 13, p 48
leak, Wants to stop, Mar. 16, p 37
meters, Proper location of, Feb. 23, p 34
Municipal control of, Apr. 13, p 31
pressure, Question of, Feb. 2, p 35; Mar. 16, p 36
range, New process, Apr. 20, p 46
soldering iron furnace, Mar. 2, p 52
stove, Eclipse, Mar 9, p 33
stoves and appliances, Jan 5, p 51
Heating power of petroleum and, Mar 23, p 37
New jewel, Mar 30, p 48
water heater, Jan 12, p 34
Phillips circulating, Apr 27, p 39
Gasoline burner for cook stove or range, Feb 23, p 31
field, Another, Jan 19, p 33
goods, Jan 19, p 44
insurance, May 18, p 25
melting furnace, Apr 13, p 40
stove, Quick meal, Mar 2, p 34
stoves, Mar 16, p 55
and insurance companies, May 11, p 42
Enameling, Feb 16, p 31; Mar 2, p 33
Insurance rates on, Feb 2, p 35; 16, p 31; Mar 2, p 32
Repairing, Apr 13, p 33; 20, p 35
Gate city rip stone faucet filter, Apr 13, p 47
German stove trade, Feb 16, p 29
Gilmour atomizer, June 8, p 42
Globe soldering furnace, Feb 23, p 41; Mar 23, p 39
Gold plentiful, How to make, Feb 2, p 35
Golden crown butchers' meat tray, May 4, p 41
combination bath and lavatory, May 25, p 32
Good advice, Feb 2, p 41
Goulds' electric triplex pump and belt tightener, May 25, p 37
Granite ironware, Changes in list prices, Jan 12, p 54.
Grate, Phillips Sanitary, Apr 6, p 52
Rockford, Mar 16, p 56
Grates, Marks on fireplace, Jan 26, p 53
Gravel roofs durable? Arc, Feb 16, p 31; Mar 2, p 32; 23, p 35; 30, p 32; Apr 27, p 36
Gravity return system for utilizing water condensation, Holly, May 18, p 38
Grease trap, Nelson siphon, May 11, p 30
Great Britain, Co-operative trading in, Mar 2, p 31
Greenhouse heating, June 8, p 29; 15, p 30
piping, Joints in, Apr 6, p 32; 20, p 35; May 4, p 29; 11, p 26
by gas, Heating of, Jan 19, p 41; May 11, p 39

Griswold coffee mill, May 4, p 41
Growth national association of master plumbers, Mar 16, p 48
Guardian fire extinguisher, Mar 30, p 48
Gumption, Jan 26, p 33
Gurney bright idea water tube heater, June 8, p 32
Gutter outlets, Rusting of, Feb 9, p 35
Gutters, Tin *vs.* galvanized iron for, June 22, p 28
Hale basin waste and plug, Feb 9, p 50
Hall's improved pipe wrench, Apr 20, p 40
Handbook of practical mechanics, Feb 2, p 46
Handle, Oven door, Apr 6, p 53
Handy pipe holder, Feb 2, p 44
pocket torch, Jan 19, p 37
Hang up drawing board with profile slate, June 29, p 34
Hardening of aluminum, Mar 23, p 42
Harlem ship canal, June 22, p 27
Harvard radiator, Apr 20, p 41
Hardware shelf box, Bennett's, Apr 20, p 47
store, Arrangement of, Mar 9, p 32
Hardwood bathtub, Mar 16, p 49
Haste and waste, Jan 19, p 33
Hasty strikes, Apr 13, p 31
Health and morals, Feb 2, p 33
Healthfulness of stone-cutting, May 4, p 28
Heat and radiation, Loss of, Feb 9, p 42; Mar 23, p 36
Heater, Aqua retort, June 29, p 48
Bigley's hot water, Apr 13, p 37
Lily steel hot water, Mar 30, p 42
Mosely circulating water, Mar 23, p 46
Richmond No. 336 sectional, Apr 20, p 42
Rivet, Mar 9, p 41
Smith's little giant water, Mar 23, p 38
Tabasco water, Feb 2, p 36
Universal, Apr 27, p 46
Heaters, Lindemuth new sun steam and hot water, Apr 20, p 43
Heating and drying by use of exhaust steam and live steam reduced to low pressure, either separately or in combination, Feb 2, p 36
Heating and plumbing, Jan 5, p 53; 12, p 46; 19, p 40; 26, p 51; Feb 2, p 51; 9, p 37; 16, p 38; 23, p 35; Mar 2, p 44; 9, p 38; 16, p 41; 23, p 39; 30, p 47; Apr 6, p 41; 13, p 52; 20, p 50; 27, p 41; May 4, p 35; 11, p 33; 18, p 49; June 1, p 26; 8, p 48; 15, p 53; 22, p 37; 29, p 51
ventilating engineer—A commercial view, Jan 26, p 42
engineers, Jan 12, p 38
American society of, June 22, p 40
First annual convention American society, Jan 26, p 36
Programme American society, Jan 19, p 41
Literature, Feb 2, p 37
ventilation, Feb 23, p 40
of school buildings, Feb 2, p 39
at vaudeville theater, Electric, Apr 6, p 41
bids on, Feb 2, p 33
contracts, Apr 20, p 33
country schoolhouse, May 4, p 29
engineers, Convention of, Jan 26, p 33
from ranges, Mar 9, p 30
from stove coil, Feb 2, p 34; 9, p 40
German theater, June 1, p 36
High pressure water, Mar 16, p 35
Hot water, Mar 2, p 38
Kitchen boiler, Apr 20, p 34
notes, Jan 5, p 39; 12, p 38; 19, p 43; 26, p 40; Feb 2, p 41; 9, p 44; 16, p 37; 23, p 38; Mar 2, p 40; 9, p 37; 16, p 40; 23, p 38; 30, p 43; Apr 6, p 41; 13, p 37; 20, p 44; 27, p 47; May 4, p 37; 11, p 39; 18, p 42; 25, p 31; June 1, p 38; 8, p 33; 15, p 51; 22, p 42; 29, p 46
Heating of greenhouses by gas, Jan 19, p 41
tin roofs, Mar 2, p 32
plants, Church, Mar 30, p 31
power of heating systems, Determining, Jan 26, p 40; Feb 16, p 37
petroleum and gas stoves, Mar 23, p 37
problem, Jan 12, p 37; Feb 9, p 43
stoves, Florida, as market for, Mar 16, p 55
surface, Computing, 13, p 32
surface, Radiating and, Mar 16, p 35
systems, Introducing, Feb 23, p 36
water by electricity, Feb 16, p 31
incandescent lamps, Mar 2, p 32
Method of, Feb 16, p 30; Mar 23, p 35
Pipe for, Jan 5, p 30
Heedlessness, Feb 23, p 29
Henrie improved plumbers' and tinners' soldering furnace, Mar 16, p 48
Hercules seamless copper ball float, June 8, p 32
Hersey heating boilers, June 8, p 35
High grade closet fixtures, Mar 2, p 42
pressure job, Apr 6, p 41
water heating, Mar 16, p 35
Hints in regard to window display, Feb 16, p 50
Hobbies, Feb 9, p 33
Hodgdon's brass pipe hanger, Apr 13, p 45
Holes in copper tank lining, Apr 6, p 32; 20, p 36
Holly gravity return system for utilizing water of condensation, May 18, p 38
Home made tinware, Apr 20, p 34
Hopeful indications, Few, Apr 6, p 36
Hornless water closet, Mar 2, p 44
Horse sense, Jan 26, p 33
Hose mender, Ideal, June 22, p 44
Hot blast brazier's furnace, Jan 26, p 44
plates, Gas, Apr 6, p 53
water connection, Direct, Feb 23, p 31
heating, Mar 2, p 38
and ventilating system, May 4, p 36
Circuit system of, Jan 12, p 36; Mar 23, p 37; Apr 13, p 36
plant at Oregon State Reform School, Apr 13, p 34
job, Circuit, Mar 16, p 40
piping, Formula for, Mar 23, p 38
Hotter water, Wants, Feb 23, p 31
House drainage inspection, Feb 2, p 44
heating boiler question, How to regulate, June 22, p 44
How to bind *The Metal Worker*, Mar 16, p 35
make boiler, Apr 6, p 33
gold plentiful, Feb 2, p 35
put collars in furnace, Apr 6, p 33; 27, p 36
Hudson Co., N. J., Plumbers, May 11, p 32
river, Stove and hardware dealers along, Mar 23, p 44
Humboldt lavatory basin, Feb 16, p 33
I X L vent cap, Mar 30, p 35
Ice pick, Polar, May 18, p 29
Ideal steam boiler, Apr 20, p 44
water filter, Mar 16, p 44
Ideals, Apr 13, p 31
Illinois plumbers, May 4, p 33
Illness in Secretary Thomas, Feb 16, p 50
Illuminant, New, Feb 16, p 29
Improperly arranged plumbing, Feb 16, p 34
Improvement, Some signs of, Mar 30, p 31
Incandescent lamps, Heating water by, Mar 2, p 32
Incendiarism made easy, Apr 20, p 33
Index notice, Feb 9, p 33
India, Trade education in, Apr 13, p 31
Indiana gas belt, Fire losses in, Apr 13, p 40
stove trade, Ohio and, Jan 12, p 49
Inside cold air duct, Mar 16, p 36; 30, p 33; Apr 20, p 34
Insufficient air supply, Feb 9, p 35
Insurance companies, Gasoline stoves and, May 11, p 42
Insurance rates on gasoline stoves, Feb 2, p 35; 16, p 31; Mar 2, p 32
Integrity, May 4, p 27
Introduciug heating systems, Feb 23, p 36
Investment? Is it a good, Feb 23, p 31; Mar 23, p 35
Invincible boiler, Apr 6, p 40
Iowa steam fitters, Feb 2, p 41
Iron and steel sheets, Apr 20, p 50
castings, Galvaniziug, Jan 5, p 30
platforms for cisterns or wells, Mar 23, p 43
pipe, Allowance for, Mar 23, p 32
roof, Condensation under, Jan 19, p 34
Irregular flaring shape forming transition from round horizontal base to round top placed vertically, Pattern for, May 25, p 35
Japanning tin, Mar 23, p 32
Jets and sprays, June 15, p 42
Jewel gas stoves, New, Mar 30, p 48
Job, High pressure, Apr 6, p 41
Joints in greenhouse piping, Apr 6, p 32; 20, p 35; May 4, p 29
Judging by appearances, June 22, p 27
Jupiter hot air furnace, June 29, p 47
Kansas City plumbing ordinance, Apr 6, p 34
Keen & Hagerty, May 18, p 35
Keeping shop tools, Mar 23, p 35
Kelly extension slip joint connection, Feb 16, p 32
Kelly's urinal connection, Apr 27, p 40
Kerosene as wood preservative, Jan 12, p 40
King grip burner, May 4, p 41
Kitchen boiler below range, May 11, p 27; 18, p 24; 25, p 28; June 1, p 25
explosions, Apr 13, p 44
to prevent, Apr 6, p 34
heating, Apr 20, p 34
Kitchen boiler, pressure on, Apr 13, p 32
Kitchen of future, Mar 9, p 29
spoon, Columbian, June 1, p 40
time table, Mar 2, p 35
Kitchens, Some American, Mar 9, p 29
"Knock down" steel range, June 22, p 43
L. & H. process stove, Feb 9, p 38
Labor and public carriers, Feb 2, p 48
Employment of, Jan 12, p 31
on pipe-fitting contracts, Estimating, Feb 9, p 35
Ladies' Delight oil cooker, Mar 16, p 43
reception and entertainments, June 15, p 44
Lamp, Improved Meriden, June 29, p 42
Rochester giant, June 29, p 42
trade, May 18, p 27; June 22, p 43
Lantern, Dietz crystal, Jan 19, p 44
Dietz tubular mill, Jan 12, p 47
Lathe, Dimensions of small treadle, Feb 9, p 50
Launch, Sheet metal, Mar 30, p 34
Lavatory basin, Humboldt, Feb 16, p 33
Lawn sprinkler, Comet, Mar 2, p 35
Eclipse, Jan 26, p 44
Philadelphia, Jan 26, p 5
Lead burning glass, Jan 12, p 33
Example of, Apr 27, p 37
lined iron pipe, Mar 9, p 45
Leader heads, Patterns for square molded, Feb 2, p 42
Legislation on unsanitary buildings, June 1, p 49
Lemon squeezers, Boss, June 1, p 40
Letter Box, Jan 5, p 30; 12, p 39; 19, p 34; 26, p 34; Feb 2, p 34; 9, p 34; 16, p 30; 23, p 30; Mar 2, p 32; 9, p 30; 16, p 34; 23, p 32; 30, p 32; Apr 6, p 32; 13, p 32; 20, p 34; 27, p 34; May 4, p 28; 11, p 26; 18, p 24; 25, p 26; June 1, p 24; 8, p 28; 15, p 30; 22, p 28; 29, p 32
Letters from glass, Wants to remove, Mar 9, p 30
"Light, heat and power for 23 cents a day," June 8, p 33
Lily steel hot water heater Mar 30, p 42

Lincoln latch lock, June 8, p 40
Lindemann & Hoversou Company, A. J., Feb 2, p 52
Lindemann's folding oven, Jan 26, p 53
Lindemuth new sun steam and hot water heaters, Apr 20, p 43
Lining slate tank, Mar 9, p 32
tauks with lead, Mar 30, p 32
List American manufacturers tin and terne plates and brands, Jan 5, p 42
American tin plate works, Apr 6, p 31
Literature heating and ventilating, Feb 2, p 37
Little wonder gas bath heater, Apr 13, p 43
Live wire and plumbing, Feb 9, p 46
Local associations, May 18, p 32; 25, p 33
Location of registers, Apr 20, p 33
London, Paris and New York, June 15, p 56
Looney's zinc shingles, Feb 16, p 39
Loss of heat and radiation, Feb 9, p 42; Mar 23, p 36
pressure by bends, June 29, p 32
Lubricator, Powell gas engine, Apr 20, p 54
McDonald's Eureka seat, Jan 26, p 47
McDowell portable oven, May 11, p 41
McShane Mfg. Company, Heury, Apr 27, p 37
Macy manual arts building, June 8, p 27
Maelstrom siphon closet, Jan 12, p 34
Magic dish drainer, Apr 13, p 47
Mahony vertical section steam or water boiler, Mar 2, p 36
Main be run ? How shall the, May 18, p 42; June 1, p 26
Maine plumbers, Apr 27, p 40
Making fire pot coil, Apr 20, p 36; May 4, p 28
oil tank, Feb 16, p 31; Mar 2, p 33
Mammoth tubular furnace, May 4, p 39
Manual instruction in Australia, May 4, p 39
Manufacture and sale of warm air furnaces from New York State and its effects on heating stove trade, Mar 9, p 48
of furnaces in Syracuse, Mar 23, p 53
of tubular articles, Feb 9, p 53
Manufacturers, Boon to, May 18, p 23
National convention, Jan 12, p 32
Plumbers' list of, Mar 16, p 48
prudential expenses, Feb 9, p 44
railroads and, Jan 26, p 35
Stove Repair Company, June 29, p 49
Marble and basins, Cement for, Mar 23, p 32; Apr 13, p 33
Market, Rising, May 25, p 25
Marks on fire place grates, Jan 26, p 53
Mason receiver, Feb 2, p 40
Massachusetts plumbing law, May 11, p 31
Measure patterns, June 1, p 24
Meat cutter, New Triumph, June 22, p 46
tray, Golden crown butchers', May 4, p 41
Meathe, Reception to President, June 29, p 45
Mechanical telephone, Feb 23, p 30
vs. natural ventilation, Feb 16, p 36
Meeting Defense Association, May 4, p 43
of National Association of Stove Manufacturers, May 4, p 42
stove associations, Apr 27, p 56
sheet manufacturers, May 25, p 38
Memoranda, Jan 12, p 48; 19, p 45; 26, p 45; Feb 2, p 49; 9, p 38; 16, p 43; 23, p 42; Mar 2, p 35; 9, p 33; 16, p 44; 23, p 44; 30, p 49; Apr 13, p 49; 20, p 47; 27, p 58; May 4, p 41; 11, p 37; 18, p 29; 25, p 41; June 8, p 42; 22, p 46; 29, p 43
Mending a boiler, Mar 30, p 32
Merchant & Co., incor., New York branch of, May 18, p 44
Meriden lamp, Improved, June 29, p 42
Merrell nipple and pipe mill machine, May 18, p 30
pipe machine, June 22, p 50
Metal brick, Weight of, June 15, p 31
tiles, May 18, p 34
Metal *vs.* earthern tiles, Apr 27, p 50
worker, Opportuuity for, May 11, p 25
Metals, Sheet, Jan 5, p 32
Method of heating water, Feb 16, p 30; Mar 23, p 35
Michigan master plumbers, Jan 26, p 46
Milk can breast, Pattern for, Apr 6, p 33
Evans protective, Mar 16, p 44
delivery cau, Porcelain lined, Mar 23, p 44
Milky water from boiler, May 25, p 28; June 1, p 25
Miller Range & Furnace Company, Wm., Apr 13, p 50
Mills, Black plate, Mar 9, p 42
Milwaukee Gas Stove Company, June 1, p 43
Mincing knives, Daisy, Jan 26, p 44
Miscellaneous, Jan 5, p 34, 50
Mismanaged furnace, Apr 6, p 32
Missouri plumbers' convention, Feb 23, p 33
Model Mfg. Company, May 11, p 31
Modern plumbing regulations, Jan 19, p 36
tin plate plant, Mar 2, p 45
Money, Volume of, May 18, p 33
Montreal master plumbers, Jan 26, p 49
Mop holder, Arcade, May 4, p 41
Triumph self-wringing, May 18, p 27
wringer, T. I. C., Feb 16, p 42
Morriu packingless valve, Apr 6, p 42
Morrison's bath fixture, June 22, p 33
Mortality iu 1894, Business, Jan 5, p 29
Mortar and brick hods, Steel, Mar 2, p 35
Anti-freezing, Feb 16, p 31; Mar 2, p 33
Mosely circulating water heater, Mar 23, p 46
Motive powers and their practical selection, June 22, p 54
Mug, Cream City, May 18, p 28
Municipal cleansing and public health, Feb 9, p 46
control of gas, Apr 13, p 31
Murray's report, Sec., Jan 19, p 40
Myers' improved drop valve, Feb 16, p 42
spray pumps, May 4, p 40
Napoleon radiator, Apr 27, p 42
National association of iron roofing manufacturers, Jan 12, p 43
convention, Call for, May 4, p 32
manufacturers, Jan 12, p 32
fitters' association, Jan 5, p 39
Sheet Metal Roofing Company, Apr 27, p 49
temperature regulator, May 11, p 38
Natural gas in foundry cupolas, Mar 16, p 33
Salt Lake supplied with, Mar 23, p 51
Nelson siphon grease trap, May 11, p 30
Nestable strainer pails, May 18, p 29
Net weight of tin plates, Jan 12, p 41
New England and Excelsior coil boilers, May 25, p 31
stove trade, Apr 6, p 52
trades school, Apr 27, p 33
era siphon closet, Mar 23, p 45
favorite postal balance, Feb 2, p 50
Jersey State association, June 15, p 44
process gas range, Apr 20, p 46
of pickling metal, Mar 2, p 46
publications, Feb 2, p 46; June 22, p 54
York, Changing, June 1, p 23
City, Ash bag system in, Apr 27, p 33
east side chat, Mar 2, p 49
Overcrowded, Feb 2, p 33
State steam fitters, Mar 9, p 38
trades school, Apr 6, p 49
badge, Apr 13, p 38
Steam and hot water heating at, Jan 12, p 36
big schemes, June 8, p 36
parlor stove, Jan 26, p 34
Newell-Booth Company, Ltd., Apr 27, p 40
News and notes, Jan 19, p 33; 26, p 49. Feb 2, p 46; 9, p 33; March 16, p 51; Apr 13, p 46
Association, Mar 2, p 41
Niagara cross lock seamer, May 11, p 36
ejector, Mar 30, p 35
improved slip roll former, May 18, p 35
Nichols tap and reamer wrench, Mar 9, p 37
Nikola Tesla's misfortune, Mar 23, p 27
Nipple and pipe mill machine, Merrell, May 18, p 30
No. 4 fire pot, Apr 13, p 46
20 power pipe machine, Mar 23, p 49
343 oil heater, June 29, p 41
Noisy faucets, June 1, p 34
Novelty circulator, double, Juue 22, p 41
Obituary :
Bailey, James S., Jan 12, p 49
Barstow, Amos C., Feb 16, p 47
Howes, S. M., Mar 23, p 53
McCullough, Wm., May 4, p 44
McKay, Alexander, Mar 16, p 51
Manion, Michael J., June 15, p 45
Mowry, James D., Mar 2, p 40
Peckham, S. Townsend, May 18, p 47 ; 25, p 43 (illustrated)
Swett, Geo. W., May 4, p 44
Thomas, Daniel M., Mar 2, p 48 (illustrated)
Wheeler, Russell, Jan 12, p 52
Objects to waste and cool water, Feb 23, p 30
Observation, Mar 2, p 31
Obtaining smooth castings, May 11, p 49
Octagonal heads, Patterns for, Mar 9, p 39
Odd plates, Jau 5, p 51; 12, p 50; 19, p 51; 26, p 54; Feb 2, p 53; 9, p 51; 16, p 48; 23, p 48; Mar 2, p 50; 9, p 50; 16, p 57; 23, p 54; 30, p 52; Apr 6, p 53; 13, p 51; 20, p 52; 27, p 57; May 4, p 47; 11, p 49; 18, p 47; 25, p 47; June 1, p 43; 8, p 46; 15, p 54; 22, p 49; 29, p 49
Odorless steel sanitary dump cart, Jan 19, p 35
Offset, oblong to round, Pattern for, Mar 23, p 40; Apr 20, p 34
Ohio and Indiana stove trade, Jan 12, p 49
State plumbers, Mar 9, p 44
valley, Stove trade in, Mar 2, p 49
Oil burner, New, Feb 23, p 46
cook stove, Splendid, May 25, p 42
cooker, Ladies' delight, Mar 16, p 43
heater, No. 343, June 29, p 41
stove market, Mar 30, p 51
stoves in Turkey, Apr 20, p 52
tank, Eureka, self-measuring, June 8, p 42
Making, Feb 16, p 31; Mar 2, p 33
Oil gas vaporizing junior cook stove, Apr 20, p 47
Old stove, Feb 23, p 30
Onderdonk combination steam trap, Feb 2, p 37
Open work fixtures, Mar 30, p 35
Operation of siphon closets, Mar 23, p 46
Opinions from trade, Jan 5, p 49
of trade, Jan 5, p 38
Oregon State Reform School, Hot water heating plant at, Apr 13, p 34
Organization, Benefits from, Jan 19, p 37
Oriel window, Pattern for base of, June 22, p 36
Ornate low radiator, Apr 6, p 42
radiator, Mar 9, p 36
Ornaments, Sheet metal, Mar 30, p 46
Oster adjustable ratcher die stock, Apr 20, p 45
Oven door handle, Apr 6, p 53
Lindemann's folding, Jan 26, p 53
McDowell portable, May 11, p 41
thermometer, Mar 2, p 49; Apr 13, p 49
Overcrowded New York, Feb 2, p 33
Overflow and strainer, with clean out screw, Apr 6, p 34

Overproduction in sight? Is, Mar 2, p 45
Pails, Nestable strainer, May 18, p 29
Pantry sink, Sauitas, May 4, p 33
Paper water pipes, Mar 16, p 53
Partnership, Terms of, Apr 6, p 33
Passing of depression, Jan 12, p 31
Paste for asbestos paper, Mar 2, p 32; 16, p 37; Apr 6, p 32; 20, p 36
Patent air blast oven and broiler burner, Feb 23, p 42
Patentable and unpatentable iuventions, Apr 27, p 47
Patronize the plumber, Jan 12, p 34
Pattern, Elbow, Mar 23, p 32
for base of oriel window, June 22, p 36
beveling elbow, Apr 6, p 45
conveyer, Mar 23, p 33
diagonal raking bracket under hipped roof, Apr 27, p 48
fluted cone, Jan 19, p 34
irregular flaring shape forming transitiou from round horizontal base to rouud top placed vertically, May 25, p 35
milk can breast, Apr 6, p 33
offset, oblong to round, Mar 23, p 40; Apr 20, p 34
tee joint, Feb 23, p 40
of frustum of coue intersecting cyliuder, Jau 19, p 53
wanted, Mar 23, p 35
Patterns for can boss to fit around faucet, June 8, p 30
circular leader head, Juue 1, p 28
cold air box, June 8, p 30
octagonal heads, Mar 9, p 39
square molded leader head, Feb 2, p 42
Peckham of stove association, Death of ex-treasurer, May 18, p 47
Peerless gas generator and burner, Juue 29, p 46
Peuusylvania plumbiug law. Feb 2, p 44
steam fitters, June 15, p 50
Peppermint test, Apr 20, p 35
Perfect brass pipe hauger, Jan 26, p 47
Perfection gas range, Test of the, Apr 20, p 51
irrigating pump, New, Feb 23, p 32
refrigerators, New, June 1, p 39
Perry Stove Company, June 22, p 48
Persistency, May 25, p 25
Peterseu mangle, June 1, p 39
Petroleum and gas stoves, Heating power of, Mar 23, p 37
Philadelphia Commercial Museum, May 18, p 23
lawu sprinkler, Jan 26, p 45
Phillips circulatiug gas water heater, Apr 27, p 39
sanitary grate, Apr 6, p 52
Pickling metal, New process of, Mar 2, p 46
Pipe coveriugs, Tests of uon-conductiug, Mar 9, p 37
cutter, Four-wheel, Mar 2, p 44
Trimo, June 22, p 44
fitting contracts, Estimating labor ou, Feb 9, p 35
questiou, Feb 9, p 43; Mar 9, p 36; 23, p 36
for heating water, Jau 5, p 30
hanger, Bray, May 11, p 21
Columbia, Jan 19, p 41
Hodgdon's brass, Apr 13, p 45
Perfect brass, Jan 26, p 47
holder, Handy, Feb 2, p 44
Lead lined iron, Mar 9, p 45
machiue, Merrell, June 22, p 50
No. 20 power, Mar 23, p 49
threading and cutting ofl machiue No. 2½, Armstroug, Jau 12, p 36
Truck made of, Apr 13, p 33
wrench, Vest pocket, June 1, p 35
Pipes burst by freezing, Mar 16, p 35
Paper water, Mar 16, p 53
Pipes, Water hammer in, Mar 16, p 35; 23, p 35
Piping, Faulty arrangement of, Feb 9, p 34
Planished iron for locomotive jackets, Displacing, Mar 23, p 27
trade, May 11, p 25
Plating room, Regulation of current in, June 22, p 48
stove ornaments, May 4, p 44
Plea for temperance, Feb 16, p 31
Plug basin, Delaware, Apr 13, p 45
Plumber, Justice to, June 8, p 43
Patronize the, Jan 12, p 34
Woman, Feb 23, p 34
Word for, Apr 27, p 37
Plumbers, Thirteenth annual convention of national association master, June 15, p 32
Allentown, Pa., Feb 23, p 32
and kuights of tabasco, Master, Jan 19, p 36, 40
and tinners solderiug furuace, Henrie improved, Mar 16, p 48
Association, English, June 15, p 51
Association, Philadelphia Master, Jau 12, p 35
what is remedy? What are abuses that have developed in master, June 15, p 45
be served by au agreement that they should not handle tools? Would not interests of master, June 22, p 31
Chicago, master, Feb 9, p 46, 49
Connecticut State, Feb 9, p 47
conveution, Missouri, Feb 23, p 33
conventions, Essays at, Apr 6, p 34
Graduated, Apr 13, p 45
Growth of national associatiou of master, Mar 16, p 48
Is it not in some cases, a bolster and indorsemeut of unworthy? To what extent may municipal legislation be relied upon to enhance the stauding of master, June 22, p 32
list of manufacturers, Mar 16, p 48
Maine, Apr 27, p 40
Michigan master, Jan 26, p 46
Montreal master, Jan 26, p 49
National association of, June 29, p 44
New Jersey State association of, June 29, p 45
New York master, Jau 12, p 33; Feb 16, p 35; Mar 9, p 44
Newark, N. J., Jan 19, p 36
Ohio Statc, Mar 9, p 44
organize, Scranton, Jan 19, p 37
Rhode Islaud master, Feb 23, p 32
specialties, May 25, p 32
Standing committees of New York, Feb 2, p 46
Torouto master, Mar 30, p 37
Willimantic master, Feb 9, p 46
Wisconsin, Jan 19, p 36
Plumbing and gas fitting, Jan 5, p 35; 12, p 33; 19, p 36; 26, p 46; Feb 2, p 44; 9, p 46; 16, p 32; 23, p 32; Mar 2, p 41; 9, p 44; 16, p 48; 23, p 45; 30, p 35; Apr 6, p 34; 13, p 43; 20, p 37; 27, p 37; May 4, p 32; 11, p 30; 18, p 31; 25, p 32; June 1, p 34; 8, p 43; 15, p 32; 22, p 30; 29, p 44
Effects of blasting on, June 29, p 44
establishment, Model, Feb 23, p 32
Example of faulty, Feb 16, p 32
Exposed, June 8, p 43
graduates of Pratt Institute Trade School, May 4, p 34
Improperly arrauged, Feb 16, p 34
Iron aud brass, Juue 15, p 31
law, Connecticut's proposed, Jau 19, p 39
Peunsylvania, Feb 2, p 44
Live wire and, Feb 9, p 46
news, Montreal, Juue 29, p 44
ordinance, Kansas City, Apr 6, p 34
regulations beneficial, Juue 8, p 43
Modern, Jan 19, p 36
Plumbing specialties, Wade's, Mar 23, p 47
Suit for defective, Mar 30, p 36
systems, Draining, Mar 16, p 48; Apr 6, p 34
trade, Review of, Jan 5, p 35
Pocket torch, Handy, Jan 19, p 37
Poetry in trade, Jan 19, p 44
Polar ice pick, May 18, p 29
Polishing and buffiug machine, May 18, p 26
Politeness, Jan 12, p 31
Polluted well water, Jan 26, p 43
Pompeiian bathroom, Jan 19, p 33
boiler, Feb 9, p 43
Popular hot water fireplace, Mar 2, p 37
Porcelain lined milk delivery cau, Mar 23, p 44
Portable radiator, Apr 20, p 39
Postal balance, New favorite, Feb 2, p 50
Powell gas engine lubricator, Apr 20, p 54
Practical mechanics, Handbook of, Feb 2, p 46
Pratt Institute, Aunual exhibitiou at, June 8, p 31
Sheet metal class at, Jan 12, p 44; Apr 6, p 44
trades school, Apr 6, p 34
President Redieske's address, Jan 5, p 36
Press, Bliss deep throat power, Mar 16, p 53
Pressure and circulation, Feb 2, p 35
by bends, Loss of, Juue 29, p 32
on kitchen boiler, Apr 13, p 32
Prevention of smoke in cities, Feb 16, p 46
vs. cure, Apr 13, p 31
Problem for engineer, Mar 9, p 36
Heating, Feb 9, p 43
Programme of Americau society heating aud ventilating engiueers, Jan 19, p 41
Proper location of gas meters, Feb 23, p 34
radiators, Apr 20, p 41
Proposed stove reclassification, Jau 5, p 51
Prudential expenses, Mauufacturers', Feb 9, p 44
Public carriers, Labor, Feb 2, p 48
conveniences, Mar 23, p 45
health, Municipal cleansing and, Feb 9, p 46
Pull, a strong pull and a pull all together, A long, Juue 29, p 37
Pump and belt tightener, Goulds' electric triplex, May 25, p 37
curb and tubing, Galvanized, Apr 13, p 49
Perfection irrigating, Feb 23, p 32
Pumps, Crescent automatic spray and force, Mar 16, p 43
Empire spraying, Feb 16, p 41
ou one pipe, Two, Apr 20, p 35; May 4, p 29
Public, Apr 13, p 32
Purifyiug cistern water, Feb 2, p 34; 16, p 31
Puritan bath, Jan 26, p 46
Quakertown Stove Works, May 18, p 47
Quality of tin roofs, Mar 9, p 29, 32, 30, 33; Apr 6, p 33
Quarterly list of Americau tiu plate works, Apr 6, p 37
and brands of tin and terue plates, Apr 6, p 38
Question in furnace constructiou, Feb 23, p 30; Mar 16, p 37
of gas pressure, Feb 2, p 35; Mar 16, p 36
Questions in steam heating, Jan 12, p 39
Quick meal balance door, Mar 30, p 38
gasoline stove, Mar 2, p 34
tank for 1895, Jan 12, p 32
Radiating and heating surface, Mar 16, p 35
Radiation, Scant, Mar 2, p 32
Radiator, Fire caused by, Feb 9, p 43
Harvard, Apr 20, p 41
Napoleon, Apr 27, p 42
New rococo, Apr 13, p 38
Ornate, Mar 9, p 36

Radiator, Ornate low, Apr 6, p 42
Portable, Apr 20, p 39
screen, Jan 19, p 42
St. Louis three-column, Feb 16, p 36
valve, Western Tube Company's hot water, Apr 6, p 41
Radiators, Proper location of, Apr 20, p 41; May 11, p 38
Revised price-list, Jan 12, p 57
Short talk on construction of hot water, Jan 26, p 41
Railroads and manufacturers, Jan 26, p 35
Raisin seeder, Enterprise, Mar 16, p 43
Ezy, June 29, p 43
Range and safe makers' open end hand brake, May 25, p 40
Ranges, Heating from, Mar 9, p 30
Reader, Appreciative, Feb 16, p 31
Reading stove dealers' association, Feb 9, p 39
Receiver, Mason, Feb 2, p 40
Recent revisions in brass lists, Jan 5, p 57
Reception to President Meathe, June 29, p 45
Reckless building, Mar 16, p 33
Redieske's address, President, Jan 5, p 36
Refrigerator, Dining room, Jan 12, p 47
Refrigerators, Show case, Jan 19, p 45
Registers, Placing, May 4, p 29
Regulation of current in plating room, June 22, p 48
Repairing gasoline stoves, Apr 13, p 33; 20, p 35
Repairs, stove, Feb 23, p 45
Report of essay committee, Mar 30, p 37
Required horse-power for tin mills, Feb 23, p 43
Resistance to corrosion of some light aluminum alloys, Jan 19, p 54
Resolutions on death of D. M. Thomas, Apr 27, p 56
Retail merchant and irregular competition, Apr 6, p 31
store, Jan 12, p 47; 19, p 44; 26, p 44; Feb 2, p 49; 9, p 38; 16, p 41; 23, p 42; Mar 2, p 34; 9, p 33; 16, p 43; 23, p 42; 30, p 48; Apr 13, p 47; 20, p 46; May 4, p 40; 18, p 27; 25, p 41; June 1, p 39; 8, p 40; 22, p 43; 29, p 40
Retrospective, Jan 5, p 29
Review of plumbing trade, Jan 5, p 35
Revised price-list radiators, Jan 12, p 57
Rhode Island master plumbers, Feb 23, p 32
Richmond No. 336 sectional heater, Apr 20, p 42
Rimmed covers for coffee pots, Mar 9, p 32
Rinsing tank, Trouble with, Apr 20, p 36
Rivet heater, Mar 9, p 41
Riveting iron pipe, May 25, p 26; June 29, p 33
Roaster or oven, Champion, Mar 23, p 43
Rochester mammoth fount, Feb 16, p 41
Rockford grate, Mar 16, p 56
Rococo radiator, New, Apr 13, p 38
Rolling mills, Women in, May 4, p 30
Roman baths, Will construct, Apr 20, p 38
Roof for theater, Sliding, Apr 20, p 48
problem, Mar 9, p 31
Roofer, The, Mar 30, p 45
Roofers' and tinners' furnace, New, Jan 5, p 32
Roofing and cornice, Jan 5, p 31; 12, p 43; 19, p 46; Feb 2, p 42; 9, p 36; 16, p 39; 23, p 39; Mar 9, p 39; 16, p 45; 23, p 48; 30, p 44; Apr 6, p 48; 13, p 41; 20, p 48; 27, p 48; May 11, p 35; 18, p 34; June 1, p 28; 8, p 38; 22, p 36; 29, p 34
Class, Tinsmithing, May 11, p 36
trade, Jan 5, p 31
manufacturers, National Association of iron, Jan 12, p 43
slate association, New, Mar 16, p 45
for, Mar 30, p 45
tin, Tarred paper under, June 15, p 31; 29, p 33
Roofing trade in West, Jan 12, p 44
Rough winter on stoves, Feb 23, p 45
Round loaf baking pan, Jan 12, p 47
Rubber elbow, Douglas, Mar 16, p 48
Rule for steam mains, Wanted, June 1, p 37
Furnace, Mar 23, p 35
pipe, Feb 2, p 35
Rulings, Treasury, Apr 6, p 37
Rustic steam connection, Apr 13, p 33
Rusting of gutter outlets, Feb 9, p 35
tin roof, Jan 12, p 40
S. & G. clamp and testing cover, Jan 26, p 46
S. & W. drilling attachment, Mar 16, p 52
St. Louis three-column radiator, Feb 16, p 36
Salvage closet connection, Mar 9, p 46
Sanitary aspects, Mar 9, p 29
Exposition in Paris, June 15, p 29
fixtures, Apr 20, p 37
school buildings, Mar 30, p 35
Sanitary Security Company, Feb 16, p 40
Is it, May 4, p 29; 11, p 27; 18, p 24
Sanitas crown closet, Apr 13, p 43
pantry sink, May 4, p 33
Sanitation, Feb 16, p 32
Scale, New tin plate, Jan 26, p 50
Scant radiation, Mar 2, p 32
Scaphander, May 11, p 29
School buildings, Heating and ventilation of, Feb 2, p 9
Sanitary, Mar 30, p 35
Day classes at New York trades, Feb 9, p 46
house, Heating country, May 4, p 29
room air, June 29, p 31
Schools, trades, Apr 6, p 46
Ventilating, Feb 16, p 36
Scoop and scale, Combined, Feb 3, p 49
Scranton plumbers organize, Jan 19, p 37
Scrap, Jan 5, p 37; 12, p 41; 19, p 48; 26, p 50; Feb 2, p 47; 9, p 45; 16, p 45; 23, p 43; Mar 2, p 47; 9, p 42; 16, p 54; 23, p 50; 30, p 53; Apr 6, p 37; 13, p 39; 20, p 49; 27, p 52; May 4, p 31; 11, p 37; 18, p 44; 25, p 38; June 1, p 33; 8, p 37; 15, p 52; 22, p 39; 29, p 39
Screen, Radiator, Jan 19, p 42
Seaman's water heaters, May 4, p 32
Seat, Babette, Feb 9, p 48
McDonald's eureka, Jan 26, p 47
Secretary Murray's report, Jan 19, p 40
Second story register box, June 1, p 25
Secretaryship national association stove manufacturers, Mar 2, p 49
Settlement of trouble at Southern Stove Works, Mar 23, p 52
Tin plate, Feb 9, p 45
Sewage disposal plant, May 11, p 25
Shear and doubler, Combined tin plate, Feb 23, p 43
Extra heavy gap, Jan 12, p 42
Sheet metal ceiling, Apr 13, p 41; 20, p 48
class at Pratt Institute, Jan 12, p 44; Apr 6, p 44
front, Apr 27, p 50
gauge, Decimal, Jan 5, p 53
launch, Mar 30, p 34
ornaments, Mar 30, p 46
metals, Jan 5, p 32
zinc for eave troughs and conductors, June 22, p 29; 29, p 33
Sheppard & Co., Isaac, May 25, p 46
exhibit, Isaac A., Jan 19, p 43
Sherman's basin clamp, Mar 16, p 50
Shirk refrigerator, Apr 13, p 47
Short talk on construction of hot water radiators, Jan 26, p 41
Show case refrigerators, Jan 19, p 45
window fountain, June 8, p 28
suggestions, Wanted, Jan 19, p 35
Shut downs, Summer, June 15, p 52
Sidney, Shepard & Co., June 22, p 47
Siphon closet, New era, Mar 23, p 45
closets, Operation of, Mar 23, p 46
Siphons, Boiler, Mar 30, p 34
Situation in Wales, Apr 13, p 40
Size of gallon, Feb 9, p 34
Sizes, Dispute as to, Apr 20, p 36
Skate sharpener, B. & W., Jan 12, p 48
Slate association, New roofing, Mar 16, p 45
for roofing, Mar 30, p 45
items, Feb 16, p 39
roof at ridge and hip, Finish for, Mar 16, p 46
roofing on ridge and hip, Finish for, Mar 23, p 34
tank, Lining, Mar 9, p 32
Sliding roof for theater, Apr 20, p 48
Slip joint connection, Kelly extension, Feb 16, p 32
roll former, Niagara improved, May 18, p 35
Smith flanged ventilating fan, Mar 16, p 47
Smith's little giant water heater, Mar 23, p 38
nested stove pipe, May 25, p 42
Smoke in cities, Prevention of, Feb 16, p 46
test, Making, June 22, p 28
Snaps, Covert, Mar 9, p 33
Snow guard, Baird, Feb 23, p 39
Folsom's new model roof, Mar 9, p 40
Soap and sponge holder, Combination, June 22, p 43
Soap cup, Columbus, Mar 16, p 50
Soho foundry, Old, May 18, p 26
Solder, Cleaning, Mar 30, p 36
Quick running, May 18, p 24
Soldering with cast iron, May 25, p 33
Southern freight rates, Feb 16, p 37
Stove Works, Settlement of trouble at, Mar 23, p 52
Souvenirs and trolley ride, June 15, p 44
Specialty furnace, May 18, p 47
Specifications, Blower, Mar 2, p 36
Specimen of fine copper work, Jan 19, p 47
Spirit stove and curling iron heater, June 22, p 46
Splendid oil cook stove, May 25, p 42
Spray pumps, Myers' spray, May 4, p 40
Sprayer, Kerosene and water, June 22, p 44
Spring movings, June 1, p 23
Springfield, Mass., Trade School at, Apr 27, p 51
Sprinkler, Yankee, Mar 2, p 34
Squaring the circle, Jan 19, p 34; Feb 2, p 34
Stained galvanized iron, Mar 23, p 33
Standard fiberware, Mar 2, p 35
Standing committees of New York plumbing, Feb 2, p 46
Star couplers on supply pipes, Mar 9, p 46
wrenches, Mar 2, p 52
State association, New, June 22, p 31
Steam and hot water heating, Jan 5, p 38; 12, p 36; 19, p 47; 26, p 36; Feb 2, p 36; 9, p 40; 16, p 36; 23, p 36; Mar 2, p 36; 9, p 34; 16, p 38; 23, p 36; 30, p 40; Apr 6, p 40; 13, p 34; 20, p 41; 27, p 42; May 4, p 36; 11, p 38; 18, p 36; 25, p 29; June 1, p 38; 8, p 32; 15, p 46; 22, p 40
at New York trades school, Jan 12, p 36
trade, Jan 5, p 38
pipe, Life of, June 29, p 33
Steam box, Boat builders', Jan 26, p 35
connection, Rustic, Apr 13, p 33
diaphragm, Mar 16, p 34
fitters' convention, May 18, p 41; June 8, p 32
Iowa, Feb 2, p 41
Master, Feb 23, p 36
New York State, Mar 9, p 38
Pennsylvania, June 15, p 50
fitting class of New York Trades School, May 18, p 36
heater, Cornell, Apr 27, p 42

Steam heatiug, Canadian, Apr 6, p 42
exhaust, Apr 27, p 44
Questions iu, Jan 12, p 39
mains, Trouble with, Apr 6, p 40
sterilizer, Jan 19, p 44
trap, Ouderdonk combination, Feb 2, p 37
mortar and brick hods, Mar 2, p 35
Stepheuson's portable foot bath, June 22, p 32
Sterliug coal and gas range, May 18, p 28
Stewart water heater, May 11, p 30
Stone cutting, Healthfulness of, May 4, p 28
Stop and waste cock, Zero self-closiug, Jau 26, p 48
Wolff's cross bar, June 22, p 30
Stove and hardware dealers iu Steuben County, N. Y., Some, June 29, p 41
of Kiugston, N. Y., and vicinity, June 1, p 40; 8, p 4
associations, Meeting of, Apr 27, p 56
castings, Fouudry mixtures for, Mar 16, p 55; 30, p 50
coils, Heating from, Feb 2, p 34
dealers' association, Readiug, Feb 9, p 39
door haudles, New Alaska, Jau 12, p 50
L. & H. process, Feb 9, p 38
manufacturers, Meeting of natioual association, May 4, p 42
Secretaryship natioual association, Mar 2, p 49
market, Oil, Mar 30, p 51
Newark parlor, Jan 26, p 34
Old, Feb 23, p 30
ornaments, Plating, May 4, p 44
pipe, Smith's nested, May 25, p 42
reclassifications, Proposed, Jan 5, p 51
repairs, Feb 23, p 45
secretaryship, Mar 30, p 50; Apr 20, 51; 27, p 55
trade, 1894, Jau 5, p 46
Chicago, Feb 16, p 47; May 25, p 43
for 1894, Vapor, Jan 5, p 50
in Ohio Valley, Mar 2, p 49
Local, Jan 19, p 50; Mar 9, p 48; Apr 13, p 50; May 4, p 44
New Englaud, Apr 6, p 52
notes, Jan 5, p 46; 12, p 49; 19, p 50; 26, p 52; Feb 2, p 52; 9, p 51; 16, p 47; 23, p 45; Mar 2, p 48; 9, p 48; 16, p 55; 23, p 52; 30, p 50; Apr 6, p 51; 13, p 50; 20, p 51; 27, p 55; May 4, p 42; 11, p 42; 18, p 46; 25, p 43; June 1, p 43; 8, p 46; 15, p 54; 22, p 48; 29, p 48
Ohio, Jan 26, p 52; Feb 9, p 51; Mar 9, p 48; 23, p 52; Apr 13, p 50; 27, p 56; May 18, p 46; Jun 1, p 43; 15, p 54
Ohio and Indiana, Jan 12, p 49
Philadelphia, Mar 2, p 49
St. Louis, Feb 16, p 47
Stoves and appliances, Gas, Jau 5, p 51
hardware dealers along Hudson River, Mar 23, p 44
base burning, Jan 12, p 40
California, Jan 19, p 50
Cut prices on, Feb 23, p 45
Gasoline, Mar 16, p 55
Rough winter ou, Feb 23, p 45
Strainer, with clean out screw, Overflow and, Apr 6, p 34
Street pipes, Thawing frozen, Feb 23, p 30
Sub-letting in buildiug contracts, Mar 16, p 45
Suburban water supply, Jau 12, p 33
Suit for defective plumbing, Mar 30, p 36
Sweeping chimneys of large buildings, May 25, p 28
T. I. C. mop wringer, Feb 16, p 42
Tabasco, Master plumbers and knights of, Jan 19, p 36
water heater, Feb 2, p 36
Tank for 1895, Quick meal, Jan 12, p 32
Tanks with lead, Lining, Mar 30, p 32
Tap and reamer wrench, Nichols, Mar 9, p 37
Tapliu, Rice & Co., Juue 8, p 46
Tarred paper under roofing tin, June 15, p 31; 22, p 29; 29, p 33
Tea and coffee urn, Browne's, Feb 9, p 38
Tee joint, Pattern for, Feb 23, p 40
Telephone, Mechanical, Feb 23, p 30
Temperance, Plea for, Feb 16, p 31
Temperature regulator, National, May 11, p 38
Temperatures, Extreme, June 8, p 38
Ten-cent dinners, Apr 27, p 33
Terms of partnership, Apr 6, p 33
Tesla's misfortune, Nikola, Mar 23, p 27
Test of fire proof material, Jan 12, p 32
perfection gas rauge, Apr 20, p 51
Tests of nou-conducting pipe coverings, Mar 9, p 37
Thawing frozen pipes with electricity, Mar 30, p 36
street pipes, Feb 23, p 30
Theoretical velocity circulating pipes hot water heating, May 18, p 40
Thermograph, Bartlett's, Apr 27, p 54
Thermometer, Oven, Mar 2, p 49
Thermometers, Oven, Apr 13, p 49
Thomas, Death of Secretary, Feb 23, p 45
Illness of secretary, Feb 16, p 50
Resolutions ou death of D. M., Apr 27, p 56
Tiles, Metal *vs.* earthen, Apr 27, p 50
Time table, kitchen, Mar 2, p 35
Tin and gravel roofs, Apr 27, p 36
terne plates, Alphabetical list brands American, Jan 5, p 43
and brands, List of American manufacturers, Jan 5, 42
Japanning, Mar 23, p 32
mills, Required horse-power for, Feb 23, p 43
plate and black sheet imports, Apr 6, p 37
calculations, Apr 13, p 37
crisis in Wales, Feb 16, p 45
Welsh, Mar 2, p 46
exports in 1894, British, Jan 26, p 50
imports, Distributiou of, Feb 16, p 44
in Wales aud United States, Feb 16, p 44
lists, Our American, Jan 5, p 29
maker, Opiuions of Welsh-American, Juue 29, p 38
manufacturers on Europeau continent, May 18, p 43
plant, Moderu, Mar 2, p 45
New, Jan 12, p 41
scale, June 22, p 38
arranged, June 29, p 38
New, Jan 26, p 50
settlement, Feb 9, p 45
shear and doubler, Combined, Feb 23, p 43
suggestion, Feb 2, p 47
tongs, June 22, p 38
trade, Welsh, May 4, p 30
wage scales, Sheet, June 29, p 31
wages dispute, Jan 19, p 48
works and brands of tin and terne plates, Quarterly list of American, Apr 6, p 38
busy, Domestic, May 25, p 38
List American, Apr 6, p 31
Quarterly list of American, Apr 6, p 37
plates, Jan 5, p 40; 12, p 41; 19, p 48; 26, p 50; Feb 2, p 47; 9, p 45; 16, p 44; 23, p 43; Mar 2, p 45; 9, p 42; 16, p 54; 23, p 50; Apr 6, p 37; 13, p 39; 27, p 52; May 4, p 30; 18, p 43; 25, p 38; June 1, p 32; 8, p 37; 15, p 52; 22, p 38; 29, p 38
iu 1894
1894, British, Jan 19, p 48
Net weight of, Jan 12, p 41
roof, Cleats for, Apr 20, p 36
Tin roof, Rustiug of, Jan 12, p 40
roofs, Heating of, Mar 2, p 32
Quality of, Mar 9, p 29; 32; Mar 30, p 33; Apr 6, p 33
scrap baling press, Champion, May 4, p 30
shop, Jan 19, p 53; Feb 23, p 40; Mar 23, p 40; Apr 6, p 44; May 25, p 35; June 8, p 30
fifty years ago, Couutry, May 25, p 36
smithing, roofing and cornice class, May 11, p 36
statistics for 1894, Jau 26, p 50
vs. galvanized iron for gutters, June 22, p 28
Tinware, Home made, Apr 20, p 34
Tinned plate mauufacturers' association, June 8, p 45
Tinners, Future, Jan 26, p 33
tools, Trade iu, Jau 12, p 42
Tinning black iron, June 15, p 30; 29, p 32
Tool chest, Vanderman's steel, Mar 9, p 41
dresser, Mar 2, p 52
Tools, Keeping shop, Mar 23, p 35
Toronto master plumbers, Mar 30, p 37
Tower work in copper, Mar 30, p 44
Trade education iu India, Apr 13, p 31
in tinners' tools, Jan 12, p 42
mark, New, June 8, p 46
notes, Jan 5, p 57; 19, p 49; 26, p 58; Feb 2, p 55; 9, p 55; 16, p 46; 23, p 47; Mar 2, p 55; 9, p 43; 16, p 62; 30, p 56; Apr 6, p 48; 13, p 42; 20, p 54; 27, p 54; May 4, p 49; 11, p 40; 18, p 53; 25, p 31; June 1, p 49; 8, p 53; 15, p 60; 22, p 54; 29, p 51
Opinions of, Jan 5, p 38
report, Jan 5, p 54; 12, p 53; 19, p 55; 26, p 56; Feb 2, p 56; 9, p 54; 16, p 51; 23, p 48; Mar 2, p 53; 9, p 51; 16, p 59; 23, p 56; 30, p 55; Apr 6, p 55; 13, p 54; 20, p 55; 27, p 59; May 4, p 50; 11, p 51; 18, p 50; 25, p 49; June 1, p 46; 8, p 50; 15, p 57; 22, p 51; 29, p 52
representation, May 4, p 44
school at Springfield, Mass., Apr 27, p 51
Media, Pa., Williamson, Apr 6, p 48
New Englaud, Apr 27, p 33
New York, Apr 6, p 49
Pratt Institute, Apr 6, p 34
season, Close, Apr 6, p 31
Another, June 1, p 31
schools, Apr 6, p 46; 22, p 40
Trap ventilation necessary? Is, Mar 30, p 34; Apr 6, p 32
Traps and vents, Jan 5, p 37; 12, p 35; 19, p 38; 26, p 48; Feb 2, p 44; 9, p 49; 16, p 34; 23, p 33; Mar 2, p 42; 9, p 46; 16, p 50; 23, p 46; 30, p 37; Apr 6, p 35; 13, p 45; 20, p 38; 27, p 40; May 4, p 34; 11, p 32; 18, p 32; 25, p 34; June 1, p 34; 8, p 44; 15, p 45; 22, p 34; 29, p 45
Travel Mar 2, p 31
Treasury rulings, Apr 6, p 37
Trimo gas fitters' wrench, Feb 23, p 33
Triumph self-wringing mop, May 18, p 27
Trouble with furnacemen, Mar 30, p 34
rinsiug tank, Apr 20, p 36
steam mains, Apr 6, p 40
water tank, Mar 23, p 34
Troy Nickel Works, Jan 26, p 53
Truck made of pipe, Apr 13, p 33
Truss bottom for fiberware pails, May 4, p 40
Tubular articles, Manufacture of, Feb 9, p 53
steel wheelbarrows, Feb 2, p 49
Turkey, Oil stoves iu, Apr 20, p 52
Tuyere, Bottom, Feb 2, p 52
Two pumps on oue pipe, Apr 20, p 35; May 4, p 29
waterbacks and one boiler, Apr 27, p 36
Uniform contract, Feb 23, p 37

Unique gas fixture, Mar 30, p 36
window display, Feb 16, p 43
United States boiler, Feb 23, p 36
Unity, June 22, p 33
Universal bath heater, Apr 13, p 44
heater, Apr 27, p 46
urinal tank, Mar 23, p 45
Untrustworthiness, May 4, p 27
Unusual combination system, Mar 30, p 40
Unventilated vent, Jan 12, p 33
Urinal connection, Kelly's, Apr 27, p 40
tank, Universal, Mar 23, p 45
Utilizing artesian well pressure, Feb 16, p 30
Vacuum valve, Collapsed with, Mar 16, p 37; 30, p 33; Apr 13, p 32
What is, Mar 16, p 36
Valve, Morrin packingless, Apr 6, p 42
Myers' improved drop, Feb 16, p 42
Vandergrift, Town of, June 1, p 33
Vanderman's expansion tank, Apr 13, p 37
steel tool chest, Mar 9, p 41
Vapor stove consolidation, Jan 5, p 51
trade for 1894, Jan 5, p 50
Varnish for tools, May 25, p 26
Velocity circulating pipes—hot water heating, Theoretical, May 18, p 40
Vent cap, I X L, Mar 30, p 35
Unventilated, Jan 12, p 33
Ventilate, Why we, Jan 12, p 37
Ventilating and cold air supply for hot air furnaces, Few remarks, Mar 9, p 30
barn, Mar 16, p 34
fan, Smith flanged, Mar 16, p 47
schools, Feb 16, p 36
Ventilation, Jan 12, p 31, 45; Mar 30, p 42; June 1, p 38; 29, p 49
and heating, May 18, p 45
Heating and, Feb 23, p 40
Legal control of, June 1, p 45
Mechanical *vs.* natural, Feb 16, p 36
Ventilator, Empire, June 8, p 39
Sheet metal for, June 15, p 31
Ventilators, Dimensions of, June 29, p 33
Vermont slate manufacturers, Convention of, May 11, p 34
Victor double trolley store ladder, June 1, p 42
Vise, Combination pipe, Jan 19, p 35
jaws for tubing, May 18, p 26
Vitrified pipe, Cast or, May 4, p 34
Vulcan instantaneous water heater, May 11, p 31
Wade's Delaware basins, Apr 20, p 38
plumbing specialties, Mar 23, p 47
Wage question at Dowagiac, Apr 27, p 56
Wage dispute, Tin plate, Jan 19, p 48
Wagon equipment, May 11, p 27
Wales, Further trouble ahead in, June 22, p 38
Situation in, Apr 13, p 40
Tin plate crisis in, Feb 16, p 45
Wall street, Boom in, May 18, p 23
Wallace & Sons' 1895 catalogue, Feb 2, p 58
Wanted show window suggestions, Jan 19, p 35
Wants cement for marble and basins, Mar 9, p 30
hotter water, Feb 23, p 31
to stop gas leak, Mar 16, p 37
remove letters from glass, Mar 9, p 30
Wash down closet with hidden tank, Apr 20, p 37
Washer, Detroit florin, Apr 20, p 46
Waste and cool water, Objects to, Feb 23, p 30
trap, Air tight, Mar 16, p 44
Water backs and one boiler, Two, Apr 27, p 36
Choked, Jan 12, p 40
closet, Hornless, Mar 2, p 44
with seat attachment, Belmont, June 22, p 30
hammer in pipes, Mar 16, p 35; 23, p 35
heater, Champion, Apr 27, p 38
Clarke's instantaneous, Mar 2, p 41
Gas, Jan 12, p 34
Stewart, May 11, p 30
Vulcan instantaneous, May 11, p 31
heaters, Seaman's, May 4, p 32
still, Aero, June 29, p 39
Browne's, Feb 16, p 42
supply, Suburban, Jan 12, p 33
tank, Trouble with, Mar 23, p 34
whip, Crazy, Apr 13, p 48
Watering pot, Standard, June 1, p 42
Way to meet competition, Apr 6, p 31
Weather and plumbers, Feb 16, p 29
Weight of air, Jan 19, p 34
Well and cesspool, Apr 13, p 33
points, Enameled, May 25, p 28
water, Polluted, Jan 26, p 43
Wells, Driven, Feb 9, p 34
Welsh tin plate crisis, Mar 2, p 46
trade, May 4, p 30
plater workers' union, June 1, p 32
platers, Immigration of, June 1, p 32
West, Roofing trade in, Jan 12, p 44
Side Foundry Company, Apr 20, p 51
West's dust pan, Mar 23, p 43
Western freight rates on stoves, June 8, p 46
Stove and Mfg. Company, Feb 2, p 55
Tube Company's hot water radiator valve, Apr 6, p 41
Wheelbarrows, Tubular steel, Feb 2, p 49
Why it failed, Mar 30, p 31
Wick lift, New Bristol, June 22, p 45
Will it work? Feb 16, p 30; 23, p 30; Mar 9, p 31
Williamson trades school, Media, Pa., Apr 6, p 48
Willimantic master plumbers, Feb 9, p 46
Windmill be attached? How can, June 15, p 30
for domestic water supply, Six-foot, May 11, p 28
Material for, June 1, p 24
tanks, Frozen, Mar 2, p 32; 9, p 30
Window display, Hints in regard to, Feb 16, p 50
Unique, Feb 16, p 43
Wiped joint, Origin of, June 15, p 31
Wiping cloth, Columbia, Jan 19, p 36
Wire broom fly killer and display stand, May 18, p 28
is put up in bundles of 63 pounds, Why, June 29, p 40
Wisconsin plumbers, Jan 19, p 36
Wolff cooker, Mar 30, p 49
cross bar stop and waste, June 22, p 30
Woman plumber, Feb 23, p 34
Women in rolling mills, May 4, p 30
workers, June 22, p 27
Wood-block flooring, Jan 26, p 55
preservative, Kerosene as, Jan 12, p 40
Work of reconstruction, Mar 23, p 27
Wrench, Hall's improved pipe, Apr 20, p 40
Wrenches, Star, Mar 2, p 52
Yankee sprinkler, Mar 2, p 34
Yates patent gutter clamp, June 8, p 39
Young men's institute, New York, June 22, p 35
Zero self-closing stop and waste cock, Jan 26, p 48
Zimer gas lamp and stove, Apr 13, p 48
Zinc, Cleaning, Feb 16, p 31
Flux for soldering, Jan 19, p 35; 26, p 34
shingles, Looney's, Feb 16, p 39
vessels for drinking water, June 15, p 30

ILLUSTRATIONS.

Adams coffee pot, June 29, p 43
Aero water still, June 29, p 39
Air blast apparatus, Mar 30, p 39
oven and broiler burner, Patent, Feb 23, p 42
bound service. Mar 23, p 33
Alaska stove door handles, New, Jan 12, p 50
Aluminum coffee pot, Erie cast, May 25, p 41
egg cookers, Pure, June 29, p 40
Angle lamp, June 8, p 40
Apparatus, Air blast, Mar 30, p 39
Aqua retort heater, June 29, p 48
Arcade mop holder, May 4, p 41
Armstrong pipe threading and cutting off machine No. 2½, Jan 12, p 36
Arrangement of hardware store, Mar 9, p 32
Asbestos torch, June 1, p 39
Automatic expansion tank, Jan 12, p 37
B. & W. skate sharpener, Jan 12, p 48
Babette seat, Feb 9, p 48
Badge, New York trades school, Apr 13, p 38
Baird snow guard, Feb 23, p 39
tilting tumbling barrel. Feb 2, p 43
Baking pan, Round loaf, Jan 12, p 47
Ball cock, Boston safety, Jan 26, p 47
Barrel, Baird tilting tumbling, Feb 2, p 43
Basin Clamp, Sherman's, Mar 16, p 50
waste and plug, Hale, Feb 9, p 50
Bath and lavatory, Golden crown combination, May 25, p 32
fixture, Morrison's, June 22, p 33
heater, Little wonder gas, Apr 13, p 43
Universal, Apr 13, p 44
Puritan, Jan 26, p 46
Bathtub, Copper, Feb 16, p 34
Hardwood, Mar 16, p 49
Belmout water closet with seat attachment, June 22, p 30
Bennett's hardware shelf box, Apr 20, p 47
Berger gutter hangers, June 1, p 30
Beveling elbow, Pattern for, Apr 6, p 45
Bigley's patent hot water heater, Apr 13, p 37
Bind *The Metal Worker*, How to, Mar 16, p 35
Bishop's ceiling plate, Apr 6, p 41
Bliss deep throat power press, Mar 16, p 53
Boat builders' steam box, Jan 26, p 35
Boiler, Ideal steam, Apr 20, p 44
Invincible, Apr 6, p 40
Mahony vertical section steam or water, Mar 2, p 36
maker's bending rolls, June 8, p 36
Mending, Mar 30, p 32
Pompeiian, Feb 9, p 43
United States, Feb 23, p 36
Boilers, New England and excelsior coil, May 25, p 31
Boston safety ball cock, Jan 26, p 47
Bottom tuyere, Feb 2, p 52
Bray pipe hanger, May 11, p 31
Bread knife, Christy model No. 16, May 4, p 41
Brass, Brazing cast, Jan 26, p 34
Brazing cast brass, Jan 26, p 34
Browne's tea and coffee urn, Feb 9, p 38
water still, Feb 16, p 42
Brake, Range and safe makers' open end hand, May 25, p 40
Bryant's lightning mixer and egg beater, June 29, p 42
Building, Evolution of an old, Feb 9, p 36
Burner, Improved B. & H., June 22, p 47
King grip, May 4, p 41
Patent air blast oven and broiler, Feb 23, p 42
Buzzacott's camp cooking outfit, June 22, p 45
Camp cooking outfit, Buzzacott's, June 22, p 45
equipments, Folding, Apr 27, p 34
Can boss to fit around faucet, Patterus for, June 8, p 30
opener and cover, Eclipse, Jan 12, p 47
carpet tacks, Apr 13, p 47
openers, New, Feb 2, p 50
Canners' and tinners' furnace, Feb 2, p 46
Carton boilers, Mar 16, p 38
Ceiling panel plate with enriched center, Jan 19, p 46
plate, Bishop's, Apr 6, p 41
Columbia, Jan 12, p 37
Sheet metal, Apr 13, p 41
Champion roaster or oven, Mar 23, p 43
steel range, June 8, p 41
tin scrap baling press, May 4, p 30
water heater, Apr 27, p 38
Chautauqua eave trough hanger, Apr 6, p 48
Christy model No. 16 bread knife, May 4, p 41
Cider press, Davidson's electric, Jan 12, p 48
Circuit hot water job, Mar 16, p 40
Circulate? Will it, Jan 26, p 34; Mar 16, p 34
Circulation, Pressure and, Feb 2, p 35
Cistern or wells, Iron platforms for, Mar 23, p 43
Clamp and testing cover, S. & G., Jan 26, p 46
Clarke's instantaneous water heater, Mar 2, p 41
Closet connection, Salvage, Mar 9, p 46
Defender ventilating siphon, May 25, p 34
fixtures, High grade, Mar 2, p 42
Maelstrom siphon, Jan 12, p 34
Sanitas crown, Apr 13, p 43
with hidden tank, Wash down, Apr 20, p 37
Cloth holder, Barker's, June 22, p 43
Clothes horse, Eureka, Apr 13, p 48
Coal tongs, Perfection, June 22, p 47
Coffee mill, Griswold, May 4, p 41
pot, Adams, June 29, p 43
Cold air box, Patterns for, June 8, p 30
duct, Feb 3, p 34
Collapsed with vacuum valve, Apr 13, p 32
Collars in furnaces, How to put, Apr 27, p 36
Columbia ceiling plate, Jan 12, p 37
pipe hanger, Jan 19, p 41
wiping cloth, Jan 19, p 36
Columbus soap cup, Mar 16, p 50
Combination heating.—III., Feb 9, p 40; IV., Mar 9, p 34
pipe vise, Jan 19, p 35
system, Unusual, Mar 30, p 40
Combined scoop and scale, Feb 2, p 49
tin plate shear and doubler, Feb 23, p 43
Comet lawn sprinkler, Mar 2, p 35
Common sense dust inhibitor. Apr 27, p 35
Conductor heads.—II., Feb 2, p 42; III., Mar 9, p 39; IV., June 1, p 28
Cooker, Wolff, Mar 30, p 49
Copper bathtub. Feb 16, p 34
tower work in, Mar 30, p 44
work, Specimen of fine, Jan 19, p 47
Corn popper, Quincy, June 22, p 45
Cornell steam heater, Apr 27, p 42
Couplers on supply pipes, Star, Mar 9, p 46
Covert snaps, Mar 9, p 33
Crazy water whip, Apr 13, p 48
Cream City mug, May 18, p 28
Crescent automatic spray and force pumps, Mar 16, p 43
Crosby gang slitting machine, June 8, p 49
Cross lock seamer, Niagara, May 11, p 36
Cupola tuyeres.—III., Jan 26, p 52; IV., Feb 2, p 52
Curling iron heater, Spirit stove and, June 22, p 46
Curved molding machine, Foot power, May 11, p 34
Daisy mincing knives, Jan 26, p 44
Damper and damper clip, American, June 1, p 42
Devore's, June 1, p 42
U. S. A. stove pipe, June 1, p 41
Davidson's electric cider press, Jan 12, p 48
Defender ventilating siphon closet, May 25, p 34
Delaware basins, Wade's, Apr 20, p 38
plug basin, Apr 13, p 45
Detroit florin washer, Apr 20, p 46
Diagonal raking bracket under hipped roof, Pattern for, Apr 27, p 48
Die stock, Oster adjustable ratcher, Apr 20, p 45
Dietz crystal lantern, Jan 19, p 44
tubular mill lantern, Jan 12, p 47
Dimensions of ventilators, June 29, p 33
Dining room refrigerator, Jan 12, p 47
Dish drainer, Magic, Apr 13, p 47
Door, Quick meal balanced, Mar 30, p 38
Double seaming machine, May 11, p 41
Douglas rubber elbow, Mar 16, p 48
Drawing board with profile slate, Hang up, June 29 p 34
tables, Designs for, May 11, p 27
Drilling attachment, S. & W., Mar 16, p 52
Dripping pan corners, May 18, p 25; 25, p 27
Duct, Cold air, Feb 2, p 34
Dump cart, Odorless steel sanitary, Jan 19, p 35
Dust inhibitor, Common sense, Apr 27, p 35
pan, West's, Mar 23, p 43
East side chat, More, May 4, p 46
Eastwood valve, Feb 23, p 37
Eave trough hanger, Chautauqua, Apr 6, p 48
Eclipse can opener and cover, Jan 12, p 47
gas stove, Mar 9, p 33
lawn sprinkler, Jan 26, p 44
Egg cookers, Pure aluminum, June 29, p 40
Ezy raisin seeder, June 29, p 43
Ejector, Niagara, Mar 30, p 35
Electric heating at vaudeville theater, Apr 6, p 41
Empire spraying pumps, Feb 16, p 41
Engineer, Problem for. Mar 9, p 36
Enriched center, Ceiling panel plate with, Jan 19, p 46
Enterprise raisin seeder, Mar 16, p 43
Equivalent balance, May 18, p 27

Erie cast aluminum coffee pot, May 25, p 41
Eureka clothes horse, Apr 13, p 48
self-measuring oil tank, June 8, p 42
Evaus protective milk can, Mar 16, p 44
Evolution of an old building, Feb 9, p 36
Example of faulty plumbing, Feb 16, p 32
Exhaust steam heating, Apr 27, p 44
Expansion bolt, Cook's, June 22, p 36
tank, Anti-waste, June 8, p 33
Automatic, Jan 12, p 37
Vanderman's, Apr 13, p 37
Extending heating system, May 25, p 26
Extra heavy gap shear, Jan 12, p 42
Faulty arrangement of piping, Feb 9, p 34
Fiber ware pails, Truss bottom for, May 4, p 40
Field triumph filters, Apr 27, p 53
Filling tank, June 1, p 26
Filter, Gate City drip stone faucet, Apr 13, p 47
Ideal, water, Mar 16, p 44
Filters, Field triumph, Apr 27, p 53
Finish for slate roof at ridge and hip, Mar 16, p 46
Fire extinguisher, Guardian, Mar 30, p 48
place, Popular hot water, Mar 2, p 37
pot, No. 4, Apr 13, p 46
Florida steam boiler, New surface, May 18, p 41
Flooring, wood-block, Jan 26, p 55
Fly killer and display stand, Wire broom, May 18, p 28
Folding camp equipments, Apr 27, p 34
Folsom's new model roof snow guard, Mar 9, p 40
Foot bath, Stephenson's portable, June 22, p 32
Fount, Rochester mammoth, Feb 16, p 41
Four-wheel pipe cutter, Mar 2, p 44
Frustum of cone intersecting cylinder, Pattern of, Jan 19, p 53
Furnace, Balky, Apr 20, p 36; May 4, p 28; 18, p 24
Canners and tinners, Feb 2, p 46
experience, Peculiar, Mar 9, p 31; 23, p 34
Gas soldering iron, Mar 2, p 52
Gasoline melting, Apr 13, p 40
Globe soldering, Feb 23, p 41; Mar 23, p 39
heating with fan, May 25, p 44
Henrie improved plumbers' and tinners' soldering, Mar 16, p 48
Hot blast brazier's, Jan 26, p 44
Improved hot air, May 18, p 30
Jupiter hot air, June 29, p 47
Mammoth tubular, May 4, p 39
New roofers' and tinners', Jan 5, p 32
Trouble with, Mar 2, p 33; 23, p 32
Furnaces, How to put collars in, Apr 27, p 36
Galvanized pump curb and tubing, Apr 13, p 49
Garbage can, Sanitary, June 8, p 41
carbonizer, Household, May 25, p 42
Gas burners, New regulator for Welsbach lamp and other, June 22, p 34
fitter's wrench, Trimo, Feb 23, p 33
fixture, Unique, Mar 30, p 36
generator and burner, Peerless, June 29, p 46
heater, Novel, May 25, p 41
iron, Self-heating, June 22, p 46
lamp and stove, Zimer, Apr 13, p 48
range, New process, Apr 20, p 46
soldering iron furnace, Mar 2, p 52
stove, Eclipse, Mar 9, p 33
stoves, New Jewel, Mar 30, p 48
Selling, Mar 23, p 54
water heater, Jan 12, p 34
Phillips circulating, Apr 27, p 39
Gasoline melting furnace, Apr 13, p 40
stove, Quick meal, Mar 2, p 34
Gate City drip stone faucet filter, Apr 13, p 47
Gilmour atomizer, June 8, p 42
Globe soldering furnace, Feb 23, p 41; Mar 23, p 39
Golden crown butchers' meat tray, May 4, p 41
combination bath and lavatory, May 25, p 32
Goulds' electric triplex pump and belt tightener, May 25, p 37
Grate, Phillips sanitary, Apr 6, p 52
Rockford, Mar 16, p 56
Gravity return system for utilizing water condensation, Holly, May 18, p 38
Grease trap, Nelson siphon, May 11, p 30
Griswold coffee mill, May 4, p 41
Guardian fire extinguisher, Mar 30, p 48
Gurney bright idea water tube heater, June 8, p 32
Hale basin waste and plug, Feb 9, p 50
Hall's improved pipe wrench, Apr 20, p 40
Handle, Oven door, Apr 6, p 53
Handy pipe holder, Feb 2, p 44
pocket torch, Jan 19, p 37
Hang up drawing board with profile slate, June 29, p 34
Harvard radiator, Apr 20, p 41
Hardware shelf box, Bennett's, Apr 20, p 47
store, arrangement of, Mar 9, p 32
Hardwood bathtub, Mar 16, p 49
Heat and radiation, Loss of, Feb 9, p 42
Heater, Aqua retort, June 29, p 48
Bigley's hot water, Apr 13, p 37
Lily steel hot water, Mar 30, p 42
Mosely circulating water, Mar 23, p 46
Richmond No. 336 sectional, Apr 20, p 42
Rivet, Mar 9, p 41
Smith's little giant water, Mar 23, p 38
Tabasco water, Feb 2, p 36
Universal, Apr 27, p 46
Heaters, Lindemuth new sun steam and hot water, Apr 20, p 43
Heating at vaudeville theater, Electric, Apr 6, p 41
Kitchen boiler, Apr 20, p 34
water by incandescent lamps, Mar 2, p 32
Henrie improved plumbers' and tinners' soldering furnace, Mar 16, p 48
Hercules seamless copper ball float, June 8, p 32
Hersey heating boilers, June 8, p 35
High grade closet fixtures, Mar 2, p 42
Hodgdon's brass pipe hanger, Apr 13, p 45
Holly gravity return system for utilizing water of condensation, May 18, p 38
Hornless water closet, Mar 2, p 44
Hose mender, Ideal, June 22, p 44
Hot blast brazier's furnace, Jan 26, p 44
water heating and ventilating system, May 4, p 36
plant at Oregon State reform school, Apr 13, p 34
job, Circuit, Mar 16, p 40
How to bind *The Metal Worker*, Mar 16, p 35
put collars in furnaces, Apr 27, p 36
Humboldt lavatory basin, Feb 16, p 33
Hydrostatics, Problem in, Mar 23, p 55
I X L vent cap, Mar 30, p 35
Ice pick, Polar, May 18, p 29
Ideal steam boiler, Apr 20, p 44
water filter, Mar 16, p 44
Improperly arranged plumbing, Feb 16, p 34
Incandescent lamps, Heating water by, Mar 2, p 32
Invincible boiler, Apr 6, p 40
Iron platforms for cisterns or wells, Mar 23, p 43
Irregular flaring shape forming transition from round horizontal base to round top placed vertically, Pattern for, May 25, p 35
Jewel gas stoves, New, Mar 30, p 48
Jupiter hot air furnace, June 29, p 47
Kelly extension slip joint connection, Feb 16, p 32
urinal connection, Apr 27, p 40
King grip burner, May 4, p 41
Kitchen boiler below range, May 11, p 27; 25, p 28; June 1, p 25
heating, Apr 20, p 34
spoon, Columbian, June 1, p 40
"Knock down" steel range, June 22, p 43
L. & H. process stove, Feb 9, p 38
Ladies' delight oil cooker, Mar 16, p 43
Lamp, Improved Meriden, June 29, p 42
Rochester giant, June 29, p 42
Lantern, Dietz crystal, Jan 19, p 44
tubular mill, Jan 12, p 47
Lavatory basin, Humboldt, Feb 16, p 33
Lawn sprinkler, Comet, Mar 2, p 35
Eclipse, Jan 26, p 44
Philadelphia, Jan 26, p 45
Lead burning, Example of, Apr 27, p 37
lined iron pipe, Mar 9, p 45
Leader head, Patterns for square molded, Feb 2, p 42
Lemon squeezers, Boss, June 1, p 40
"Light, heat and power for 23 cents a day," June 8, p 33
Lily steel hot water heater, Mar 30, p 42
Lincoln latch lock, June 8, p 40
Lindemuth new sun steam and hot water heaters, Apr 20, p 43
Little wonder gas bath heater, Apr 13, p 43
Looney's zinc shingles, Feb 16, p 39
Loss of heat and radiation, Feb 9, p 42
pressure by bends, June 29, p 32
Lubricator, Powell gas engine, Apr 20, p 54
McDonald's eureka seat, Jan 26, p 47
McDowell portable oven, May 11, p 41
Maelstrom siphon closet, Jan 12, p 34
Magic dish drainer, Apr 13, p 47
Mahony vertical section steam or water boiler, Mar 2, p 36
Main be run? How shall, May 18, p 42
Mammoth tubular furnace, May 4, p 39
Manufacture of tubular articles, Feb 9, p 53
Mason receiver, Feb 2, p 40
Measure patterns, June 1, p 24
Meat cutter, New triumph, June 22, p 46
tray, Golden crown butchers', May 4, p 41
Mending boiler, Mar 30, p 32
Meriden lamp, Improved, June 29, p 42
Merrell nipple and pipe mill machine, May 18, p 30
pipe machine, June 22, p 50
Milk can, Evans' protective, Mar 16, p 44
delivery can, Porcelain lined, Mar 23, p 44
Mincing knives, Daisy, Jan 26, p 44
Mop holder, Arcade, May 4, p 41
Triumph self-wringing, May 18, p 27
wringer, T. I. C., Feb 16, p 42
Morrin packingless valve, Apr 6, p 42
Morrison's bath fixture, June 22, p 33
Mosely circulating water heater, Mar 23, p 46
Mug, Cream City, May 18, p 28
Myers' improved drop valve, Feb 16, p 42
spray pumps, May 4, p 40
Napoleon radiator, Apr 27, p 42
National temperature regulator, May 11, p 38
Nelson siphon grease trap, May 11, p 30
Nestable strainer pails, May 18, p 29
New England and excelsior coil boilers, May 25, p 31
era siphon closet, Mar 23, p 45
favorite postal balance, Feb 2, p 50
process gas range, Apr 20, p 46
York trades school badge, Apr 13, p 38
Niagara cross lock seamer, May 11, p 36
ejector, Mar 30, p 35
improved slip roll former, May 18, p 35

Nichols tap and reamer wrench, Mar 9, p 37
Nipple and pipe mill machiue, Merrell, May 18, p 30
No. 4 fire pot, Apr 13, p 46
20 power pipe machine, Mar 23, p 49
343 oil heater, Jnne 29, p 41
Novelty circulator, Donble, Jnne 22, p 41
Octagonal heads, Patterns for, Mar 9, p 39
Odorless steel sanitary dnmp cart, Jan 19, p 35
Offset, oblong to round, Pattern for, Mar 23, p 40
Oil cook stove, Splendid, May 25, p 42
cooker, Ladies' delight, Mar 16, p 43
heater, No. 343, June 29, p 41
tank, Eureka self-measuring, June 8, p 42
Oilgas vaporizing jnnior cook stove, Apr 20, p 47
Onderdonk combination steam trap, Feb 2, p 37
Oregon State reform school, Hot water heating plant at, Apr 13, p 34
Oriel window, Pattern for base of, Jnne 22, p 36
Ornaments, Sheet metal, Mar 30, p 46
Ornate low radiator, Apr 6, p 42
radiator, Mar 9, p 36
Oster adjustable ratcher die stock, Apr 20, p 45
Oven door handle, Apr 6, p 53
McDowell portable, May 11, p 41
thermometer, Mar 2, p 49
Overflow and strainer, with clean ont screw, Apr 6, p 34
Pails, Nestable strainer, May 18, p 29
Pantry sink, Sanitas, May 4, p 33
Patent air blast oven and broiler burner, Feb 23, p 42
Pattern for base of oriel window, June 22, p 36
beveling elbow, Apr 6, p 45
diagonal raking bracket under hipped roof, Apr 27, p 48
irregular flariug shape forming transition from round horizontal base to round top placed vertically, May 25, p 35
offset, oblong to round, Mar 23, p 40
tee joint, Feb 23, p 40
of frustum of cone intersecting cylinder, Jan 19, p 53
Patterns for can boss to fit around faucet, June 8, p 30
circnlar leader head, Juue 1, p 28
cold air box, Jnne 8, p 30
octagonal heads, Mar 9, p 39
square molded leader head, Feb 2, p 42
Peerless gas generator and burner, Juue 29, p 46
Perfect brass pipe hanger, Jan 26, p 47
Perfection irrigating pump, New, Feb 23, p 32
Petersen mangle, June 1, p 39
Philadelphia lawn sprinkler, Jan 26, p 45
Phillips circulating gas water heater, Apr 27, p 39
sanitary grate, Apr 6, p 52
Pipe cutter, Four-wheel, Mar 2, p 44
Trimo, Jnne 22, p 44
fitting question, Feb 9, p 43; Mar 23, p 36
hanger, Bray, May 11, p 21
Columbia, Jan 19, p 41
Hodgdon's brass, Apr 13, p 45
perfect brass, Jan 26, p 47
holder, Handy, Feb 2, p 44
Lead liued iron, Mar 9, p 45
machine, Merrell, June 22, p 50
No. 20 power, Mar 23, p 49
threading and cutting off machine No. 2½, Armstrong, Jan 12, p 36
Truck made of, Apr 13, p 33
wrench, Vest pocket, June 1, p 35
Piping, Fanlty arrangement of, Feb 9, p 34
Plating room, Regulation of current in, Jnne 22, p 48
Plug basin, Delaware, Apr 13, p 45
Plumbers' and tinners' soldering furnace, Henrie improved, Mar 16, p 48
Plumbing, Example of fanlty, Feb 16, p 32
Improperly arrauged, Feb 16, p 34
Pocket torch, Handy, Jan 19, p 37
Polar ice pick, May 18, p 29
Polishing and bnffing machine, May 18, p 26
Pompeiian boiler, Feb 9, p 43
Popular hot water fireplace, Mar 2, p 37
Porcelain lined milk delivery can, Mar 23, p 44
Portable radiator, Apr 20, p 39
Postal balance, New favorite, Feb 2, p 50
Powell gas engine lubricator, Apr 20, p 54
Press, Bliss deep throat power, Mar 16, p 53
Pressure and circnlation, Feb 2, p 35
by bends, Loss of, Jnue 29, p 32
Problem for engineer, Mar 9, p 36
in hydrostatics, Mar 23, p 55
Proposed restrictiou of Welsh tin plate production, Mar 23, p 50
Pump and belt tightener, Gonlds' electric triplex, May 25, p 37
curb and tubing, Galvanized, Apr 13, p 49
Perfection irrigating, Feb 23, p 32
Pumps, Crescent antomatic spray and force, Mar 16, p 43
Empire spraying, Feb 16, p 41
on one pipe, Two, Apr 20, p 35
Pnritan bath, Jan 26, p 46
Qnick meal balanced door, Mar 30, p 38
gasoline stove, Mar 2, p 34
tank for 1895, Jan 12, p 32
Radiator, Harvard, Apr 20, p 41
Napoleon, Apr 27, p 42
New rococo, Apr 13, p 38
Ornate, Mar 9, p 36
low, Apr 6, p 42
Portable, Apr 20, p 39
St. Louis three-column, Feb 16, p 36
screen, Jan 19, p 42
valve, Western Tube Company's hot water, Apr 6, p 41
Raisin seeder, Enterprise, Mar 16, p 43
Ezy, Jnne 29, p 43
Range and safe makers' open end hand brake, May 25, p 40
Receiver, Mason, Feb 2, p 40
Refrigerator, Dining room, Jan 12, p 47
Refrigerators, showcase, Jan 19, p 45
Regulation of current iu plating room, June 22, p 48
Richmond No. 336 sectional heater, Apr 20, p 42
Rivet heater, Mar 9, p 41
Riveting iron pipe, May 25, p 26; June 29, p 33
Roaster or oven, Champion, Mar 23, p 43
Rochester mammoth fouut, Feb 16, p 41
Rockford grate, Mar 16, p 56
Rococo radiator, New, Apr 13, p 38
Roofers' and tinners' furnace, New, Jan 5, p 32
Round loaf baking pan, Jan 12, p 47
Rubber elbow, Douglas, Mar 16, p 48
Rustic steam connection, Apr 13, p 33
S. & G. clamp and testiug cover, Jan 26, p 46
S. & W. drilling attachment, Mar 16, p 52
St. Louis three-coolumn radiator, Feb 16, p 36
Salt Lake supplied with natural gas, Mar 23, p 51
Salvage closet connection, Mar 9, p 46
Sanitary fixtures, Apr 20, p 37
Is it, May 4, p 29
Sanitas crown closet, Apr 13, p 43
pantry sink, May 4, p 33
Scoop and scale, Combined, Feb 3, p 49
Screen, Radiator, Jan 19, p 42
Seaman's water heaters, May 4, p 32
Seat, Babette, Feb 9, p 48
McDonald's enreka, Jan 26, p 47
Second story register box, Jnne 1, p 25
Selling gas stoves, Mar 23, p 54
Shear and doubler, Combined tin plate, Feb 23, p 43
Extra heavy gap, Jan 12, p 42
Sheet metal ceiling, Apr 13, p 41
front, Apr 27, p 50
oruaments, Mar 30, p 46
Sherman's basin clamp, Mar 16, p 50
Show case refrigerators, Jan 19, p 45
window fonntain, June 8, p 28
Siphon closet, New era, Mar 23, p 45
Skate sharpener, B. & W., Jan 12, p 48
Slate roof at ridge and hip, Finish for, Mar 16, p 46
Slip joint connection, Kelly extension, Feb 16, p 32
roll former, Niagara improved, May 18, p 35
Smith flanged ventilating fan, Mar 16, p 47
little giant water heater, Mar 23, p 38
nested stove pipe, May 25, p 42
Snaps, Covert, Mar 9, p 33
Snow gnard, Baird, Feb 23, p 39
Folsom's new model roof, Mar 9, p 40
Soap and sponge holder, Combination, Jnne 22, p 43
cnp, Colnmbns, Mar 16, p 50
Specimen of fine copper work, Jan 19, p 47
Spirit stove and cnrling iron heater, Jnne 22, p 46
Splendid oil cook stove, May 25, p 42
Spray pnmps, Myers', May 4, p 40
Sprayer, Kerosene and water, Jnue 22, p 44
Sprinkler, Yankee, Mar 2, p 34
Star couplers on supply pipes, Mar 9, p 46
wrenches, Mar 2, p 52
Steam box, Boat builders', Jan 26, p 35
connection, Rustic, Apr 13, p 33
fitting class of New York trades school, May 18, p 36
heater, Cornell, Apr 27, p 42
heating, Exhaust, Apr 27, p 44
sterilizer, Jan 19, p 44
trap, Onderdonk combination, Feb 2, p 37
Stephenson's portable foot bath, June 22, p 32
Sterling coal and gas range, May 18, p 28
Stewart water heater, May 11, p 30
Stop and waste cock, Zero self-closing, Jan 26, p 48
Wolff's cross bar, June 22, p 30
Stove door handles, New Alaska, Jan 12, p 50
L. & H. process, Feb 9, p 38
pipe, Smith's nested, May 25, p 42
Strainer, with clean out screw, Overflow and, Apr 6, p 34
Suburban water supply, Jau 12, p 33
T. I. C. mop wringer, Feb 16, p 42
Tabasco water heater, Feb 2, p 36
Tank for 1895, Quick meal, Jan 12, p 32
Tap and reamer wreuch, Nichols, Mar 9, p 37
Tea and coffee urn, Browne's, Feb 9, p 38
Tee joint, Pattern for, Feb 23, p 40
Temperature regulator, National, May 11, p 38
Theoretical velocity circulating pipes—hot water heating, May 18, p 40
Thermometer, Oven, Mar 2, p 49
Tin plate production, Proposed restrictiou of Welsh, Mar 23, p 50
shear and doubler, Combined, Feb 23, p 43
scrap baling press, Champion, May 4, p 30
Tool chest, Vanderman's steel, Mar 9, p 41
dresser, Mar 2, p 52

Tower work in copper, Mar 30, p 44
Trade-mark, New, June 8, p 46
Trimo gas fitter's wrench, Feb 23, p 33
Triumph self-wringing mop, May 18, p 27
Truck made of pipe, Apr 13, p 33
Truss bottom for fiber ware pails, May 4, p 40
Tubular articles, Manufacture of, Feb 9, p 53
steel wheelbarrows, Feb 2, p 49
Tuyere, Bottom, Feb 2, p 52
Two pumps on one pipe, Apr 20, p 35
water backs and one boiler, Apr 27, p 36
United States boiler, Feb 23, p 36
Unique gas fixture, Mar 30, p 36
window display, Feb 16, p 43
Universal bath heater, Apr 13, p 44
heater, Apr 27, p 46
urinal tank, Mar 23, p 45
Unusual combination system, Mar 30, p 40
Unventilated vent, Jan 12, p 33
Urinal connection, Kelly's, Apr 27, p 40
tank, Universal Mar 23, p 45
Vacuum valve, Collapsed with, Apr 13, p 32
Valve, Morrin packingless, Apr 6, p 42
Myers' improved drop, Feb 16, p 42
Vanderman's expansion tank, Apr 13 p 37
steel tool chest, Mar 9, p 41
Velocity circulating pipes—hot water heating, Theoretical, May 18, p 40
Vent cap, I. X. L., Mar 30, p 35
Unventilated, Jan 12, p 33
Ventilating fan, Smith flanged, Mar 16, p 47
Ventilator, Empire, June 8, p 39
Ventilators, Dimensions of, June 29, p 33
Victor double trolley store ladder, June 1, p 42
Vise, Combination pipe, Jan 19, p 35
jaws for tubing, May 18, p 26
Vulcan instantaneous water heater, May 11, p 31
Wade's Delaware basins, Apr 20, p 38
Wash down closet with hidden tank, Apr 20, p 37
Washer, Detroit florin, Apr 20, p 46
Water backs and one boiler, Two, Apr 27, p 36
closet, Hornless, Mar 2, p 44
with seat attachment, Belmont, June 22, p 30
heater, Champion, Apr 27, p 38
Clarke's instantaneous, Mar 2, p 41
Gas, Jan 12, p 34
Stewart, May 11, p 30
Vulcan instantaneous, May 11, p 31
heaters, Seaman's, May 4, p 32
still, Aero, June 29, p 39
Browne's, Feb 16, p 42
Water supply, Suburban, Jan 12, p 33
whip, Crazy, Apr 13, p 48
Watering pot, Standard, June 1, p 42
Welsh tin plate production, Proposed restriction of, Mar 23, p 50
West's dust pan, Mar 23, p 43
Western Tube Company's hot water radiator valve, Apr 6, p 41
Wheelbarrows, Tubular steel, Feb 2, p 49
Wick lift, New Bristol, June 22, p 45
Will it work? Feb 16, p 30
Windmill be attached? How can, June 15, p 30
for domestic water supply, Six foot, May 11, p 28
Window display, Unique, Feb 16, p 43
Wiping cloth, Columbia, Jan 19, p 36
Wire broom fly killer and display stand, May 18, p 28
Wolff cooker, Mar 30, p 49
cross bar stop and waste, June 22, p 30
Wood-block flooring, Jan 26, p 55
Wrench, Hall's improved pipe, Apr 20, p 40
Wrenches, Star, Mar 2, p 52
Yankee sprinkler, Mar 2, p 34
Yates patent gutter clamp, June 8, p 39
Zero self-closing stop and waste cock, Jan 26, p 48
Zimer gas lamp and stove, Apr 13, p 48
Zinc shingles, Looney's, Feb 16, p 39

Index to Reading Matter, Page 57.

Index to Advertisements, Pages 91 - 93.

The Metal Worker

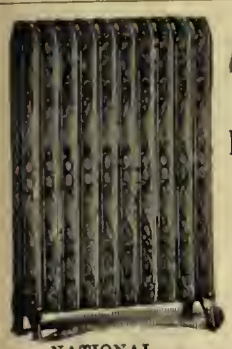
A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

VOL. XLIII. NUMBER 1.

NEW YORK AND CHICAGO, JANUARY 5, 1895.

ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



NATIONAL.

AMERICAN RADIATORS (TRADE-MARK.) BEST ON EARTH.

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

111 and 113 Lake Street, CHICAGO, ILL.

New York. 92 Centre St. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F & W CO.

GUARANTEED STOVES FURNACES RANGES & HOT-WATER HEATERS.

FULLER & WARREN CO. TROY, N.Y.

PARAGON HOT AIR FURNACES

SIX POINTS — 1·FEWEST JOINTS 2·EQUALIZED DRAFT 3·LARGEST RADIATING SURFACE 4·ABSOLUTELY SELF CLEANING 5·BALL BEARING GRATE 6·PERFECT ADAPTABILITY TO ANY KIND OF COAL

ISAAC A. SHEPPARD & CO. MANUFACTURERS PHILADELPHIA, PA. & BALTIMORE, MD.

Write for our FURNACE BOOK "HINTS ABOUT HEATING"
It will interest you IT MAY HELP YOU
EXCLUSIVE RIGHTS GIVEN TO ENTERPRISING DEALERS

APOLLO BEST BLOOM

is the brand of galvanized iron that is true to gauge, flat (does not buckle), and is uniformly workable (bends without weakening).

GALVANIZED IRON

A first-class worker in galvanized iron knows, to his cost, the difficulties, in exacting work, imposed by refractory metal and sheets not flat, and the losses incurred through varying thickness.

EVERY SHEET GUARANTEED

The extra cost is too small to appear in small sales. The actual cost of his job to the worker is less, if well done

APOLLO IRON AND STEEL COMPANY
Pittsburgh Pennsylvania
WORKS AT APOLLO
Write for New Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES
HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.

"Kitchen Boiler Connections."

A Selection of Practical Letters and Articles
—RELATING TO—
Water Backs and Range Boilers.

Compiled from *The Metal Worker*.
71 Illustrations.

A Practical Helper. Price. $1.00.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG

Has no terror for those using a

FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis Mo.

BOILERS. EXETER RADIATORS.

EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO.,
Boston, Mass.



VALVES.

WE want your trade on Valves, but not bad enough to cut Quality to compete with many manufacturers. Our theory is, as it has always been, to manufacture the best that could be produced, and trust that our friends appreciate the same.

Our New HIGH PRESSURE DISC has won thousands of friends in the past 18 months. When you buy Valves insist on having the GENUINE with Trade-Mark same as cut.

New York. Chicago JENKINS BROS. Philadelphia. Boston.

STEAM SPECIALTIES.

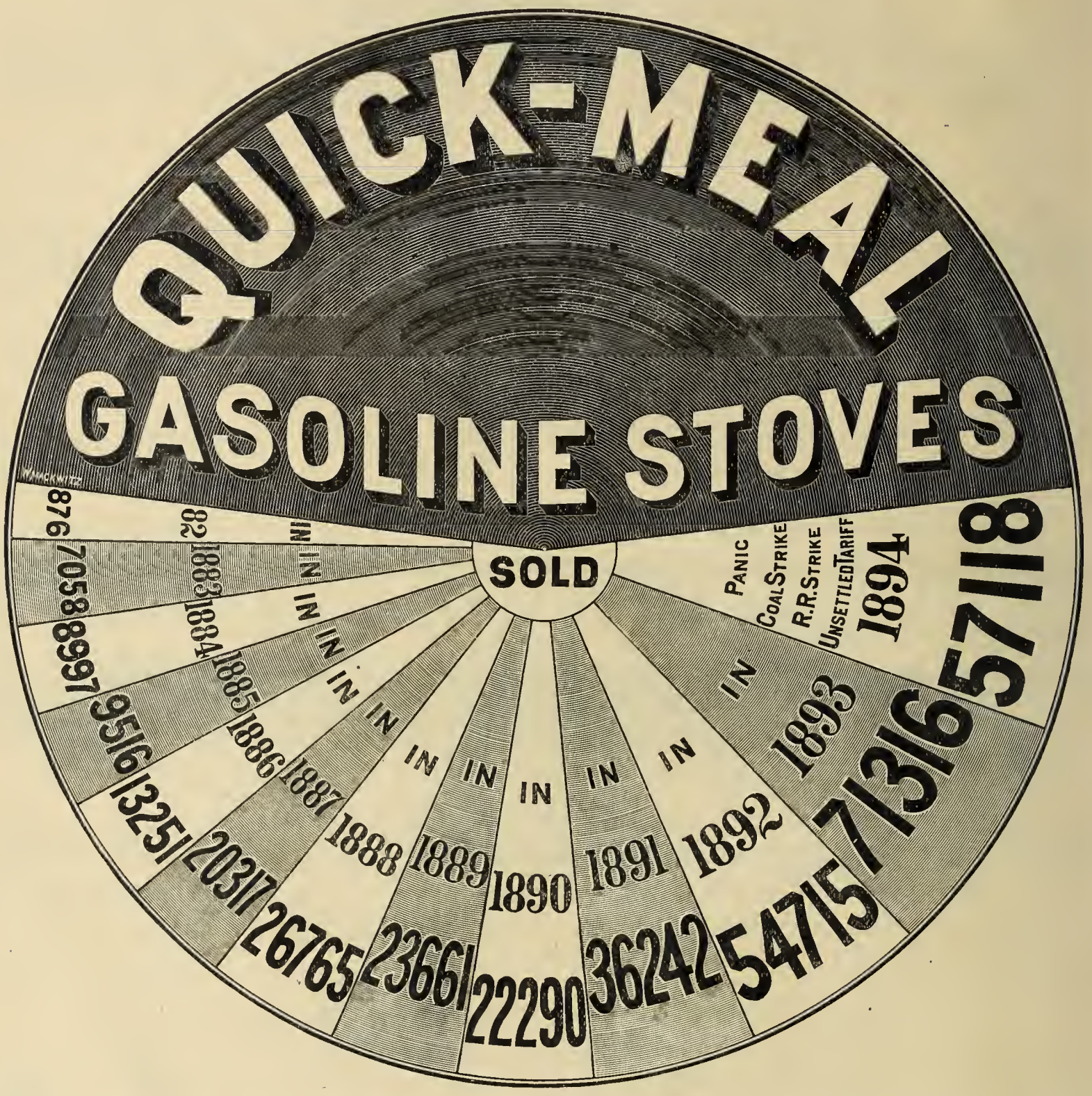
Pump Governors.
Steam Traps.
Steam & Water Reducing Valves.
Noiseless Back Pressure Valves.
Damper Regulators and Oil Separators.
Send for Circulars.



Pressure Regulating Valve

T. KIELEY, 7 to 11 W. 13th St., New York.

The Truth must be told if the Heavens fall



RINGEN STOVE CO.

ST. LOUIS.

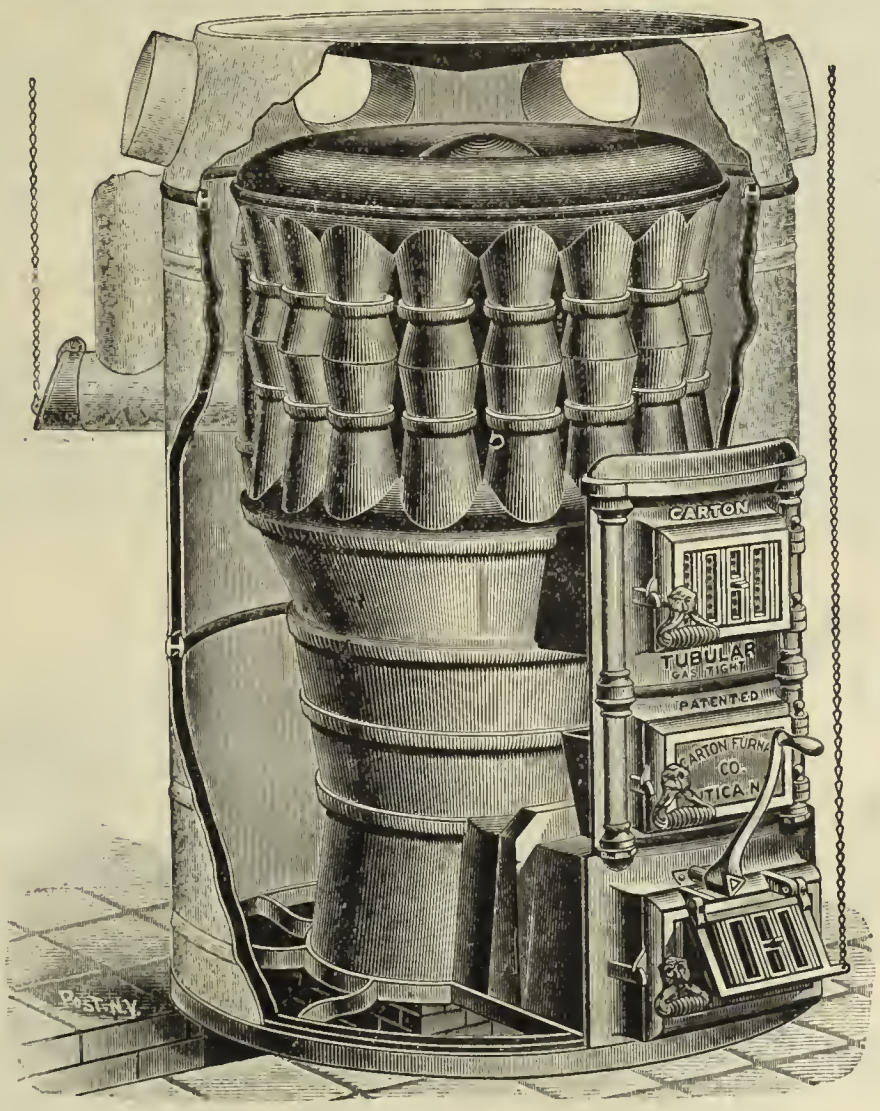
ALSO MOST COMPLETE LINE OF QUICK MEAL GAS STOVES AND RANGES.

Carton

Hot Water & Steam Boilers & Furnaces.

Our Tubular.

7 Sizes.



20 to 33 inch Fire Pots

VERTICAL COMBUSTION FLUES
WITH RETURN FLUE.
EXTRA RADIATING SURFACE
and SELF CLEANING.

WRITE US and we will INTEREST YOU.

MANUFACTURED BY

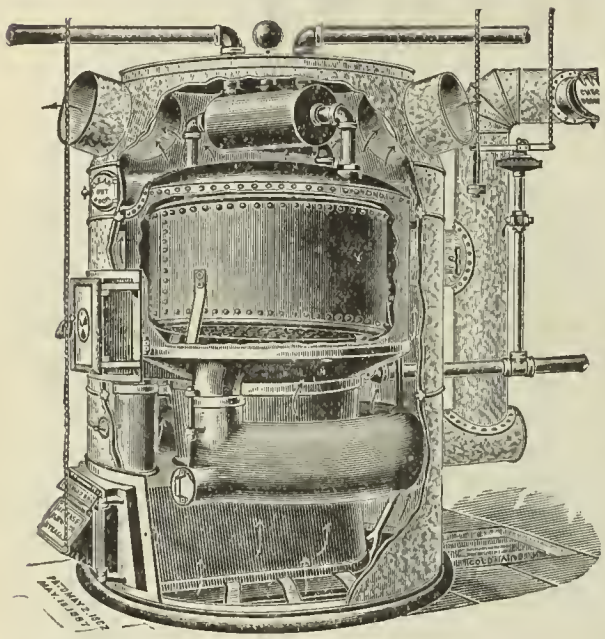
Carton Furnace Co.,

UTICA, N. Y.,

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Raud & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

VAN'S Plantation Ranges.

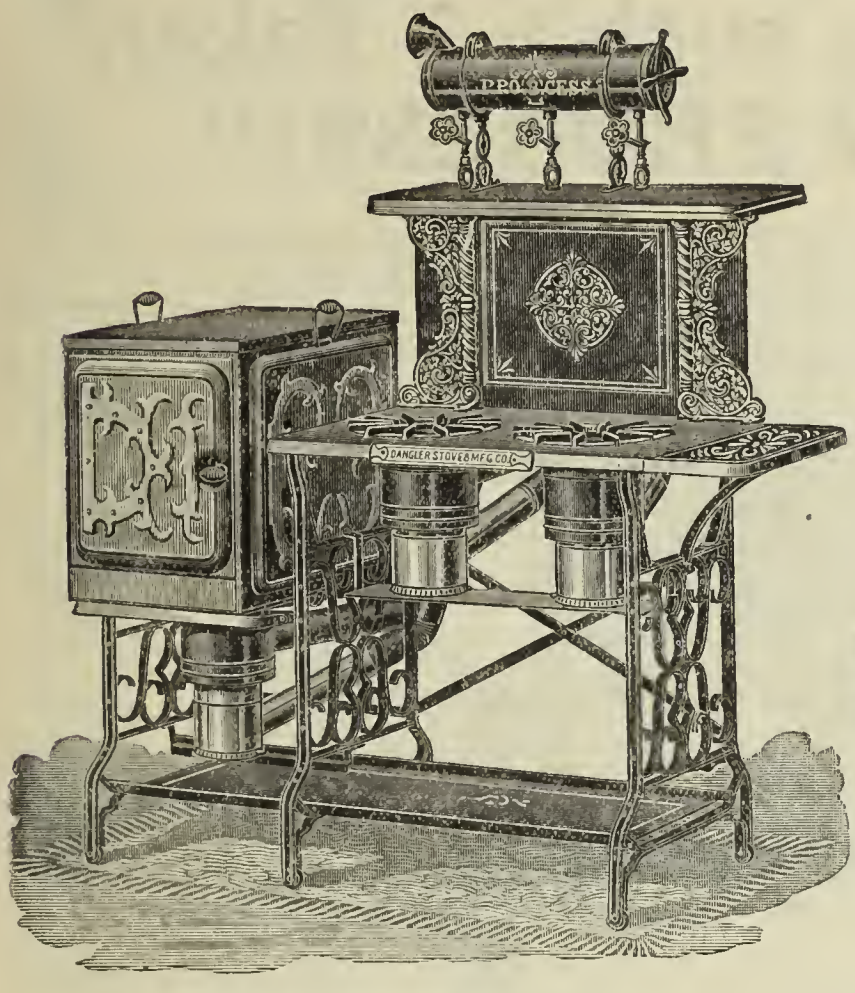
With Broiler Attachment.

The finest, most convenient and best family range ever offered for soft coal, wood or natural gas. Write for our prices before buying elsewhere. It will pay you.



THE
JOHN VAN RANGE CO.,
Mfrs. of Wrought Steel
Ranges, all sizes,
and styles,
Cincinnati, Ohio.

Facts of Interest to the Public.



Our "PROCESS" for 1895, we can say unqualifiedly, is the

MOST PERFECT WORKING

PROCESS STOVE EVER PLACED ON THE MARKET, and HAS NO EQUAL.

In calling attention to our

NEW GEM STOVE,

We offer the trade a STOVE FOR THE PEOPLE and FOR THE TIMES.

THE GEM STOVE is CONVENIENT

in SIZE, with the same sized flame as the PROCESS doing the same amount of work with **less fuel,** and at an original cost of only about ONE-HALF that of the regular high Stoves. This Stove is ABSOLUTELY our own, and CAN BE MADE ONLY BY US, and as pioneers in this business, the public naturally look to us for progress, while some of our competitors, who can only make the old line, call such improvements, "an innovation." Our GEM and PROCESS, together with our DELIGHT, celebrated JUNIORS, Individual and Single Generator Burner Stoves, &c., will give our trade a decided advantage over their competitors.

Write for Catalogue, 1895.

—THE—

Dangler Stove & Mfg. Co,

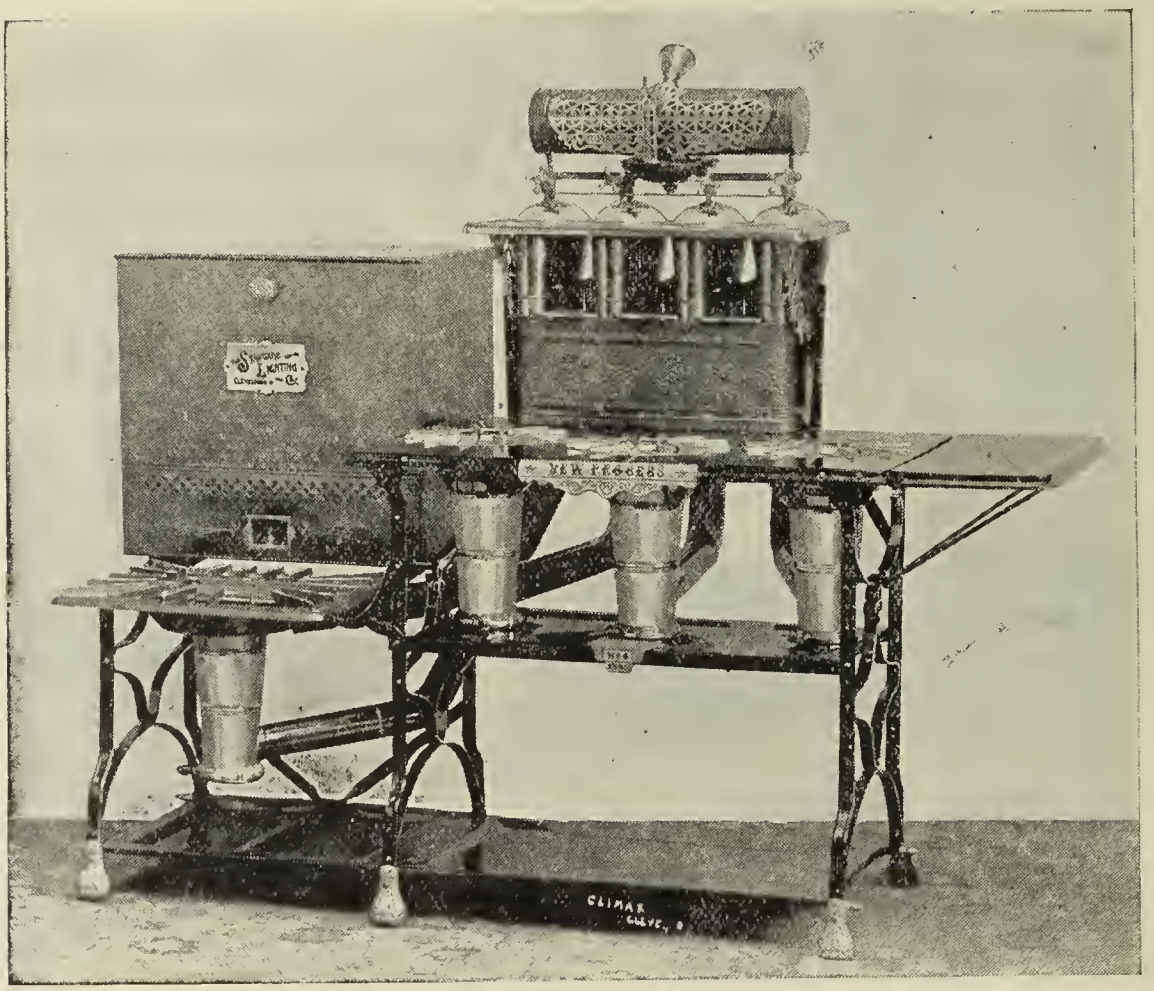
CLEVELAND, O.



WHOLESALE AGENTS:

E. H. Huenefeld, Cincinnati, O.
Standart Bros., Detroit, Mich.
Mt. Penn Stove Works, No. 111 N. 2d St., Philadelphia.
Mt. Penn Stove Works, Reading, Pa.
Barstow Stove Co., No. 228 Water St., New York.
Barstow Stove Co., No. 56 Union St , Boston.
Home Stove Co., Indianapolis, Ind.
Denver Stove & Hdw. Co., Denver, Colo.
J. P. Lindeman & Sons, Milwaukee, Wis.
R. Robinson & Sons, Chicago, Ill.
ichards-Conover Hdw. Co., Kansas City, Mo.
The Stollberg-Clapp Co., Toledo, O.
Weber & Gebnart, Dayton, O.
Bradley & Munk, Columbus, O.
Foster-Stevens Co., Grand Rapids, Mich.
The Schaab-Puff Stove Co., St. Louis, Mo.
Dunlay & Geisler, Houston, Texas.
The Wooldridge Stove Co., Memphis, Tenn.
A. Baldwin & Co., Ltd., New Orleans, La.
M. F. Tallmage, Buffalo, N. Y.
W. E. Galbreath, S. E. cor. Lombard and Light Streets, Baltimore, Md.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper ***twice over*** more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

——MADE ONLY BY——

THE STANDARD LIGHTING CO.,

CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La.
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
Milton Rogers, & Sons, Omaha, Neb.

DEALERS!

All Weak Points About Vapor Stoves

are not called to your attention by unscrupulous manufacturers or their salesmen. They often palm off imperfect and faulty stoves as perfect, and jolly you into the belief that you have struck a bargain.

But when summer comes and truth comes to light, as it invariably does in the vapor stove business, vexation and disappointment come with it. Vexation, because you have been duped, disappointment, on account of the loss of a season's profit.

Better handle a *good line* at a fair profit than a *poor* line at a *bargain* profit. There is no such thing as a "bargain," especially in the vapor stove business. *Proof*—Review the past???

Better buy from a responsible manufacturer or his legitimate jobber, especially of one whose integrity is unquestioned, and one whose knowledge of the vapor stove business secures you an honest deal and prevents the imposition of fakes or shoddy goods. *There are a few of us left.*

Better buy a good line to be successful. A *bad* stove is a very poor purchase at *any* price.

Better look for Protection.

Protection in order to be of service to you must begin at home. See that this point is not overlooked when casting about for a line for 1895.

Better think this over.

The old adage reads, "Make Haste *Slowly*." This is a weighty proverb. The more so when you consider that the best versed manufacturers in the vapor stove industry are not offering any new inventions or innovations for the coming season.

Yours respectfully,

THE SCHNEIDER & TRENKAMP CO.,

479-501 Case Ave., Cleveland, O. 67-69 Lake St., Chicago, Ill.

Jobbers Who Will Handle the Reliable for 1895.

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas and Oklahoma Territory.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F. FOX, Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Dolaware, Maryland, Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.

OUR

New Year Bow.



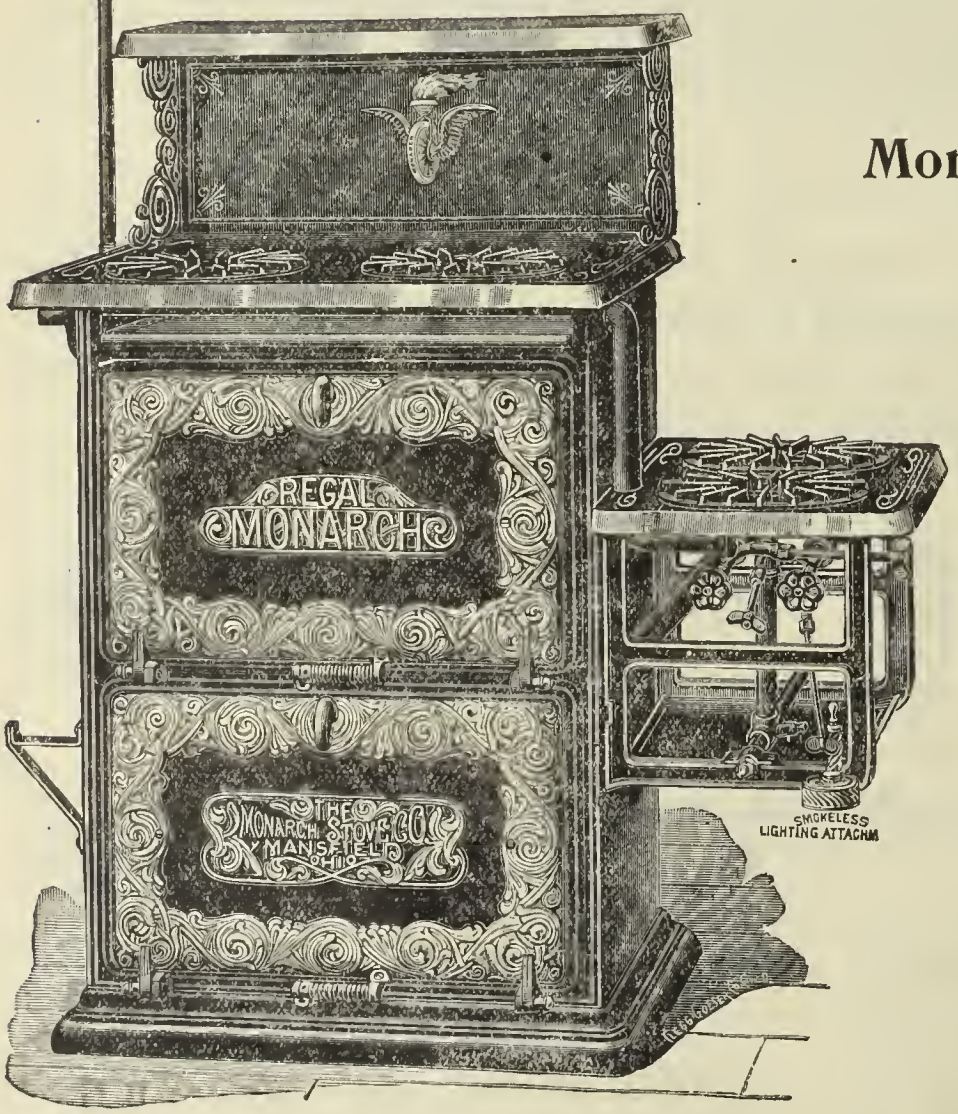
Isn't She a Beauty?

LOOK AT IT ☞



But this is only a Starter.

We've lots more of 'em equally nobby, and shown in new Catalogue, ready by February 15th, a copy of which is yours for the asking.



THE

Monarch Stove Co.,

Mansfield, O.

AGENTS:

E. H. HUENEFELD, Cincinnati, O. - Ky., Tenn., So. Ohio, So. Ind.

COOK RANGE & STOVE CO., Chicago, Ill. Wis., No. Ill.

DANVILLE STOVE CO., Danville, Pa., and 284-286 Pearl St., N. Y. Penna., New York, New Jersey, New England.

THE ZAHNER & BATTELL MFG. CO., Kansas City. Missouri, Kansas.

KROPF

VAPOR STOVES

TWELFTH SEASON

OVER 100,000 MANUFACTURED

NINETEEN DIFFERENT SIZES AND STYLES,

INCLUDING A FULL LINE OF

Evaporating Sheet Steel Vapor Stoves.

Evaporating Cast Frame Cabinet Ranges.

Hot Generating Full Size Stoves.

Hot Generating High Junior Stoves.

Hot Generating Low Junior Stoves.

DON'T BUY A VAPOR STOVE Until you have seen our New Patterns for 1895.

SAMPLES NOW READY AND CATALOGUES FURNISHED ON APPLICATION.

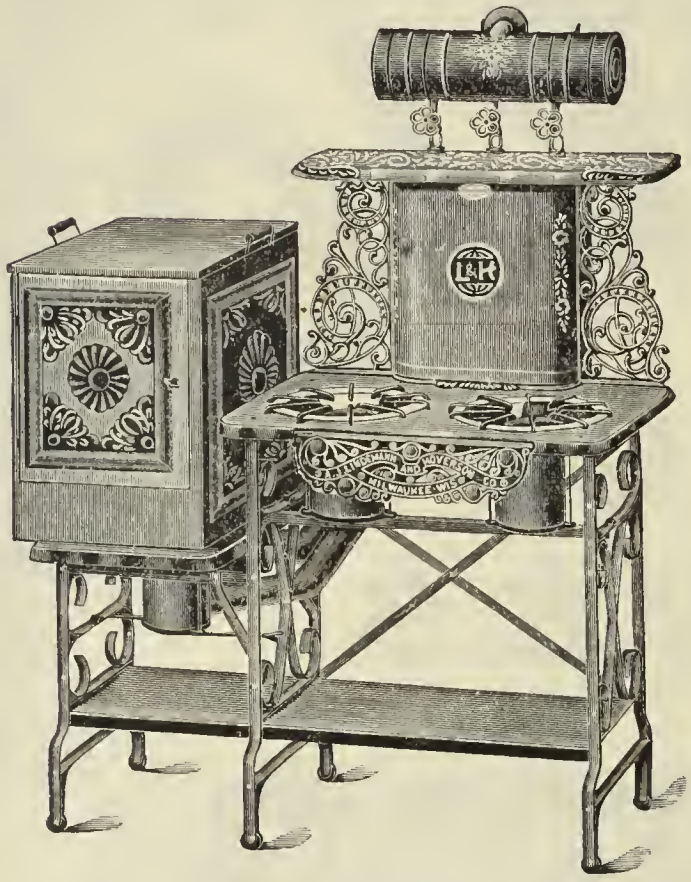
RATHBONE, SARD & CO.,

ALBANY, N.Y. CHICAGO, ILL. AURORA, ILL. DETROIT, MICH.

L. & H. STOVES

FOR

GASOLINE, GAS and OIL. (Kerosene.)



The most Complete Line, Latest Designs, Best Workmanship, Finest Appearance.

Our assortment includes Juniors, Individual Burners, Single Generators, Evaporating Process, Gas Ranges, Hot Plates, Lamp Stoves and Oil Cooking Stoves.

Write for Catalogue and Secure Agencies.

A. J. LINDEMANN & HOVERSON CO., Milwaukee, Wis.

"GOVERNOR" GASOLINE STOVES "PRINCESS"

We beg to announce to the Trade that we are now ready for the market with a most complete line of

SINGLE VALVE, DOUBLE VALVE AND SINGLE GENERATOR GASOLINE STOVES.

This being our first season in the business we have spared neither money nor labor to produce an article SUPERIOR to anything in the market for the same money.

Our Junior tops are 2 inches longer and 4 inches wider than those of other manufacturers. Our burner produces a steel-blue and more powerful flame than any other burner; cooking is done in 1-3 less time (with same amount of fuel) than any other Gasoline Stove can do it.

THIS IS ACCOMPLISHED BY MOST PERFECT COMBUSTION.

Our tank consists of two separate cans. The inside can contains the Gasoline and is provided with a vent which prevents the can from floating.

To fill our tank, simply remove cover from outside tank, lift out can, take to shed for filling and set it back again in tank. An automatic valve closes the bottom of the can.

This method of filling is far superior to all lay-down or removable tanks, and it makes

EXPLOSIONS IMPOSSIBLE.

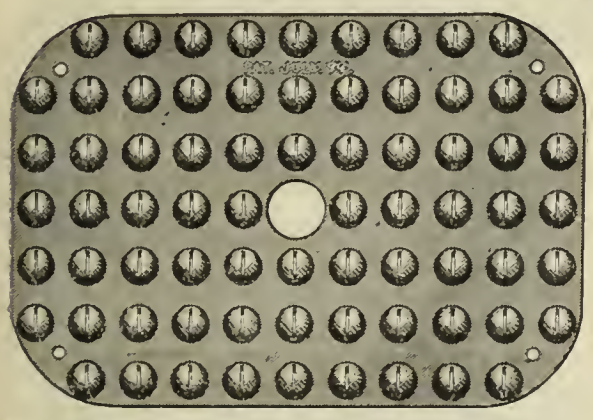
Our illustrated catalogue is now ready (it contains 44 cuts) and will be sent on application.

SEND FOR PRICES AND SECURE TERRITORY.

WESTERN STOVE & MFG. CO., - - MILWAUKEE, WIS.

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.



No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*

OUR JET CONE BURNERS distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

and

SPECIAL JUNIORS.



Simplest, Safest, Best.

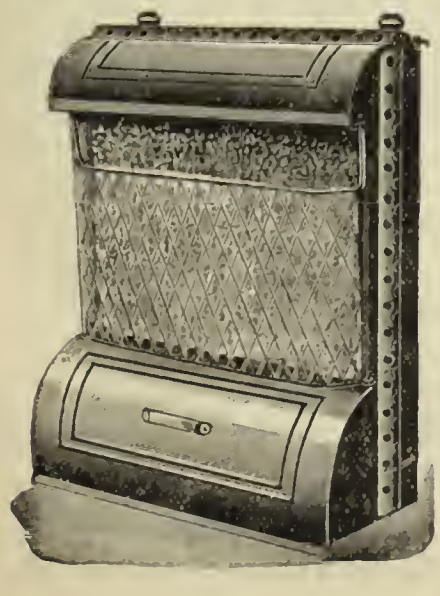
Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



HOW TO REDUCE NATURAL GAS BILLS.

THE "PITTSBURG" GAS STOVE DOES IT.

Pronounced by Experts and Users to be the Cheapest, Best and Most Economical Gas Stove in the market. The secret of its success is not only in burning the gas perfectly, but in preventing any of the poisonous gases (the waste product of combustion) from escaping into the room, and yet extracting all the heat from the gas. **No waste heat passes into the chimney, but only the waste product of combustion.**

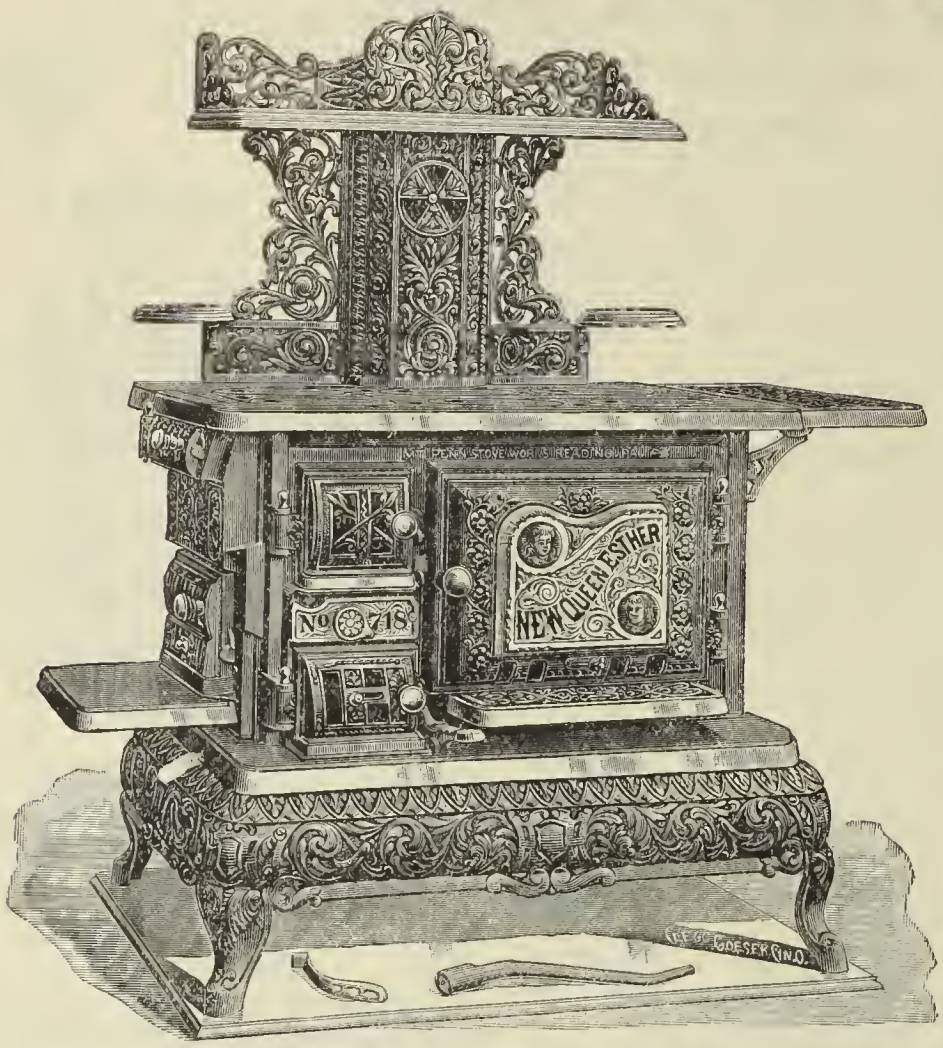
By making slight changes in burner this stove can be used for Artificial Gas also. If wanted for such purpose, please order "for Artificial Gas."

Full information cheerfully furnished. Manufactured exclusively and **for jobbing trade only,** by

DIXON-WOODS COMPANY, - Pittsburg, Pa.

OUR NEW QUEEN ESTHER

MT. PENN STOVES & RANGES



A Range embodying so many points of excellence as to carry its own recommendation to the thrifty housekeeper. Here are some of them:

Tin lined oven doors.
Patent pedal oven door opener.
Large broiling or feeder door.
Convenient flue clean-out.
Extra large flues.
Automatic or duplex grate.
Hot air attachment for auxiliary heating.
Provision for fire-box extension when burning wood.
Adaptability to coal or wood fuel.

The others we will mention on receipt of your postal.

Mt. Penn Stove Works,

Reading, Pa.

A FEW WORDS
TO THE PROGRESSIVE DEALER.

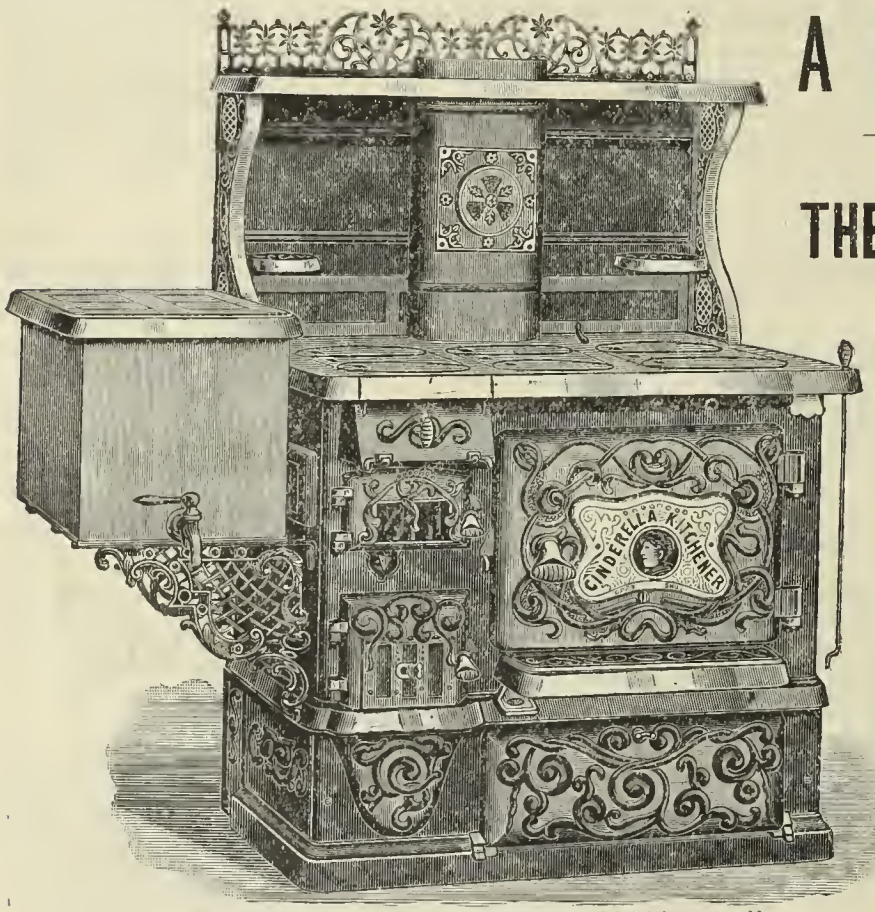
THE CINDERELLA KITCHENERS

Are an entirely new series of

ALL CAST IRON RANGES,

Adapted for burning

HARD OR SOFT COAL OR WOOD.



The Reservoir is Planished Copper, and holds fifteen gallons.

They have embodied in their construction many new and desirable features that are thoroughly practical and will meet the approval of the "up to date" dealers. The Cinderella Kitcheners are also made with feet and skirting in lieu of the Low Closet. A full complement of High Shelves and High Closets accompany the same. Every appointment is the latest, and for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No. 716,	Oven, 16 x 16,	10½ inches high.
718,	18 x 18,	11½ "
818,	18 x 18,	11½ "
719,	18 x 20,	12½ "
819,	18 x 20,	12½ "
821,	20 x 22,	13½ "
921,	20 x 22,	13½ "

IF YOU ARE INTERESTED WRITE FOR PRICES.

We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

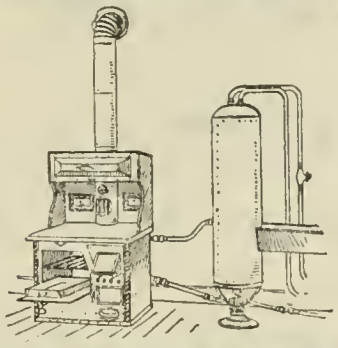
We Would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited, - - Pittsburgh, Pa.

★ STAR WATER BACK AND BOILER ★
COUPLERS.

DONT WIPE YOUR JOINTS — SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

NO SOLDER NO BURST — ANY MECHANIC CAN DO IT

WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

★

Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.
Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada.

★

LARGEST ASSORTMENT OF STYLES AND SIZES IN THE MARKET.
CORRESPONDENCE SOLICITED.
CATALOGUES GIVE FULL DESCRIPTION.

SOLD ON THEIR MERITS NOT ON THEIR ANTIQUITY.

Royal Heaters.

COMBINATION.

HOT WATER. STEAM. HOT AIR.

MANUFACTURED BY
HART & CROUSE.
UTICA, N.Y.
NEW YORK 211 WATER ST.
CHICAGO 79 LAKE ST.

THATCHER

The Celebrated

"Thatcher"

FURNACE and RANGES.

GAS-TIGHT.
DURABLE.
ECONOMICAL.

Also Manufacturers of the

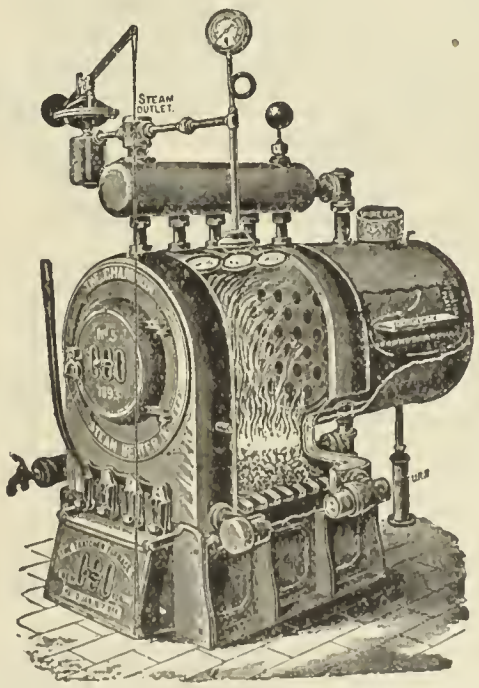
"CHAMPION"

Steam and Hot-Water Heaters.

Sold by the trade extensively throughout the country.

Specified by Leading Architects.

Illustrated Catalogue Sent Free.



Champion Steam Heater.

Has advantages over any other Heater.

Send for Circular.

The Thatcher Furnace Co.,

240 WATER ST., NEW YORK.

ROUND CLIMAX.



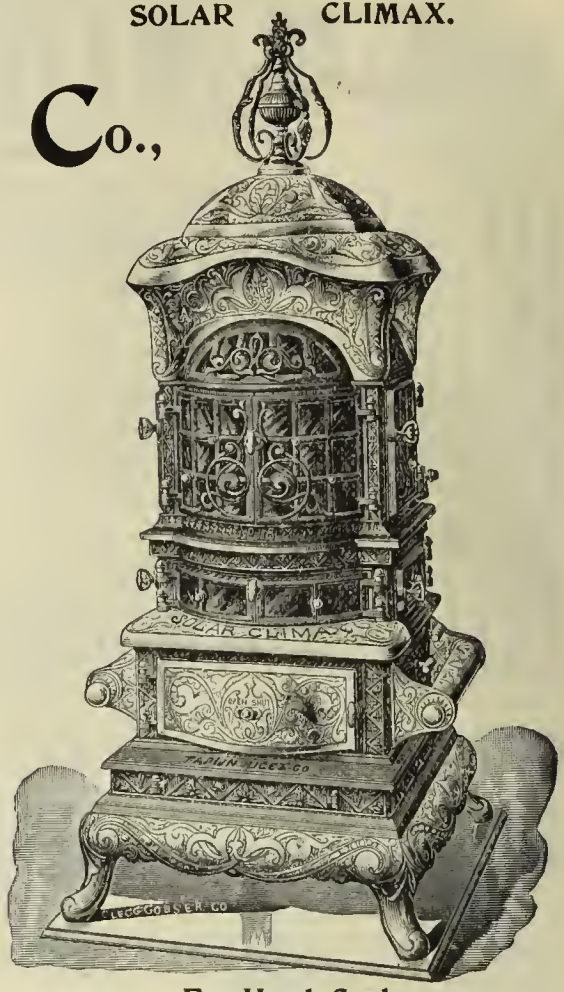
For Soft Coal and Wood.
Three Sizes: Nos. 14, 16, 18.
Single or Double Sectional Fire Pot.

Taplin, Rice & Co.,

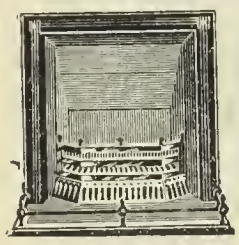
AKRON, OHIO,

MANUFACTURE established leaders in the line of **COOK and HEATING STOVES** and hereby respectfully solicit inquiries and orders for their specialties.

SOLAR CLIMAX.



For Hard Coal.
Three Sizes: Nos. 114, 115, 116.



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

— A DIVERTER.—Harry: "Some women do have a remarkable faculty for invention."

Will: "For instance?"

Harry: "The wife of a friend of mine has patented what she calls a 'snore diverter.' It is composed of a hood and a section of flexible pipe. When her husband's snores grow unbearable the hood is lowered over his head and the snore is conducted into the cellar."

Will: "What then?"

Harry: "There hasn't a rat been seen in the house since the diverter was used."—*Pittsburgh Bulletin.*

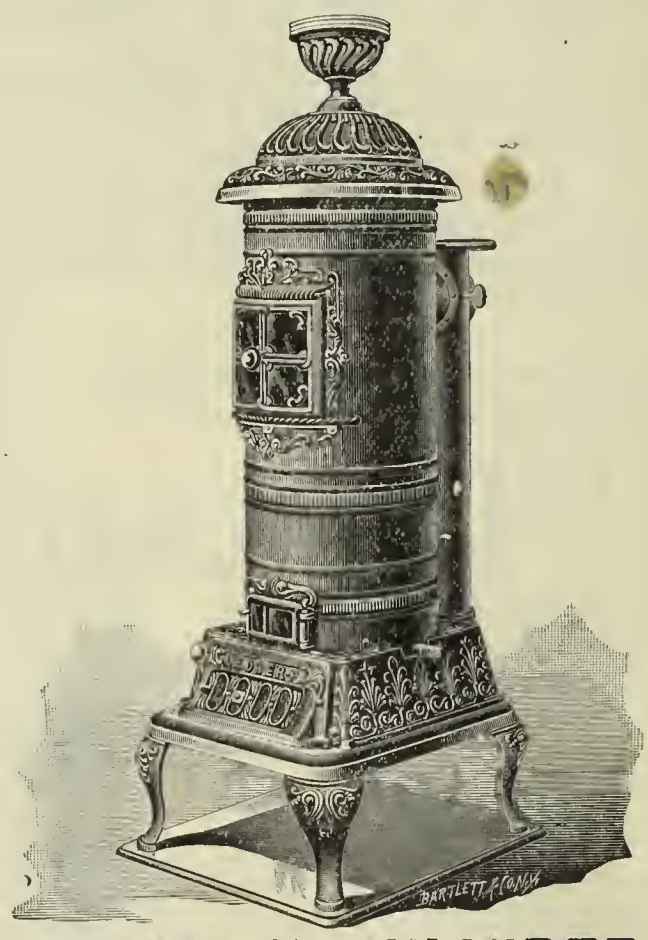
— AN IMPRESSION.—The reed bird, delicate and delicious, lay supine on a bit of toast when Uncle Caleb from New Jersey sat down.

"Are you fond of the little fowl?" asked the hostess.

"Well," he replied, "ez fur taste, they're fine. But ez for 'pearance, I must say they 'mind me of a mosquiter growed up."—*Washington Star.*

— Mrs. Culture of Boston had been making inquiries about the healthfulness of the place.

"No," replied the summer boarding house keeper, snappishly, "no, we ain't got no typhoid germs, and there hain't been no calls for 'em either. Folks is wanting everything nowadays, and ain't satisfied with clean beds and plenty of what's good to eat."—*Texas Siftings.*



LEDGER F CYLINDER.

WITH REVERTIBLE FLUE. No. 9, No. 10, No. 12, No. 14.

Well made, attractive in appearance and attractive in price. Made both as a plain cylinder and with revertible flue as above. Circulars and prices are worth seeing. Send for them.

THE STAMFORD FOUNDRY COMPANY,

STAMFORD, CONN.

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.

FAULTLESS.

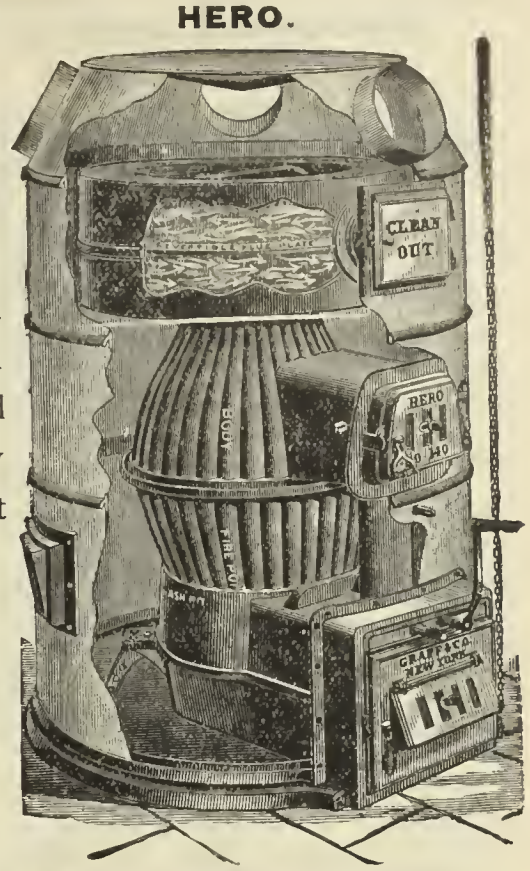


YOU WANT THE BEST FURNACE

That you can buy, and we have got it. You will not be disappointed in any selection you may make from our assortment of

FURNACES OR RANGES.

HERO.



SMITH & BRIGHT,
175-177 Lake St., Chicago, Ill.

GRAFF & COMPANY, Manufacturers,
208 Water Street, New York.

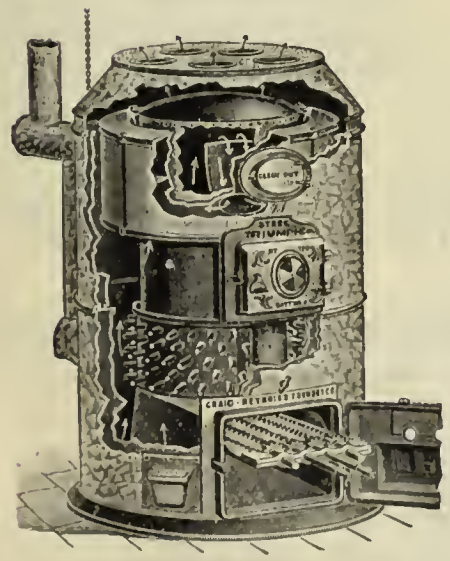
—THE—
Craig-Reynolds Fdy. Co.,
DAYTON, O.,
Founders,

AND

GEO. D. HOFFMAN,
Mgr. Western Branch,
82 LAKE STREET, CHICAGO,

Mfrs.
The
TRIUMPH
Furnaces.
"There are none better."

Wish all Dealers



A Happy and Prosperous New Year.

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student, and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

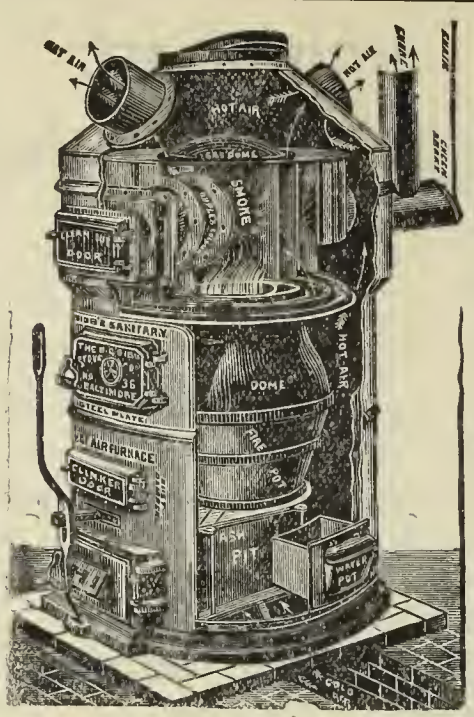
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

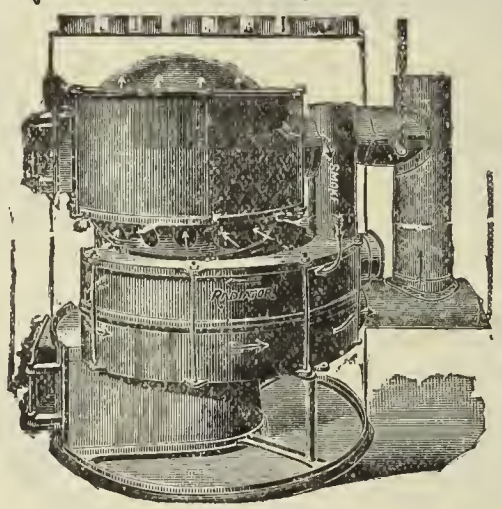
Baltimore Fire Place Heaters,

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.

DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

It Is a Base Burner.
It Is a Great Economizer of Fuel.
It Does Not Heat the Cellar
It Is a Low Furnace.

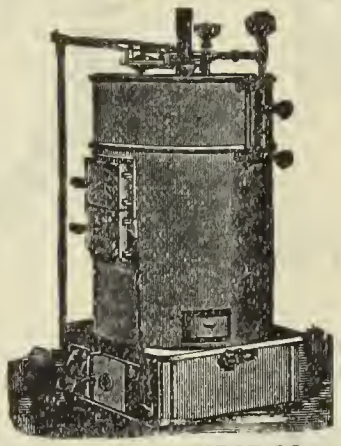
The "Perfect" Ventilator

The "Crown" or "Stasch" Folding Bake Pan.

Agents Wanted. Address—

The CORNING MANUFACTURING CO.,
CORNING, N. Y.

"JUST A LITTLE"



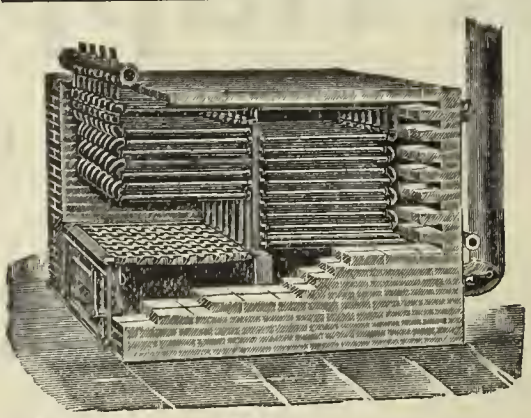
FUEL, TIME, CARE } TO { RUN IT. SET IT UP. MANAGE IT

That's all, and how it does heat!

WHAT? Why, the "PAGE."

Further information will cost you the time of writing for our catalogue—it's worth it.

W. C. MOWRY, Lock Box 314, NORWICH, CONN.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

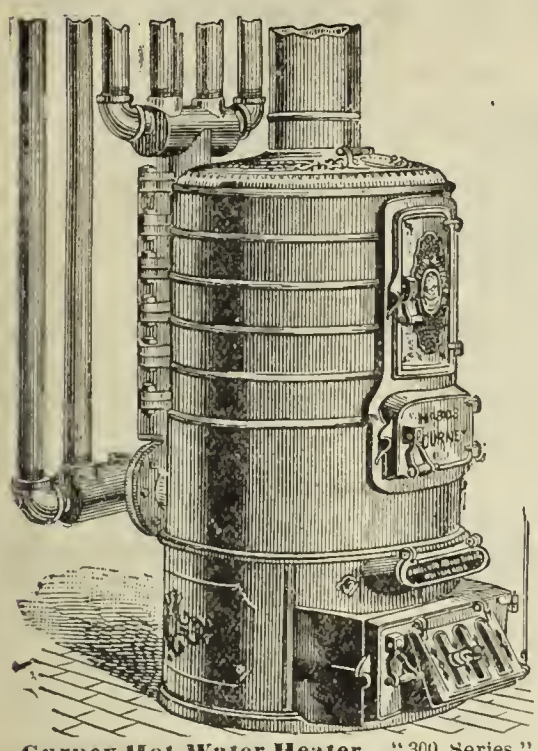
Over 300 Different Sizes.

SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
15, 17, 19 ACHILLES ST.,
ROCHESTER, N. Y.

New York Office, 44 Dey Street.



Gurney Hot Water Heater. "300 Series."

RESULTS ARE CONVINCING EVIDENCE.

THE GREAT SUCCESS WHICH

Gurney

HOT WATER HEATERS, STEAM BOILERS RADIATORS,

Have attained is due to the **FACT** that they embody

BEST

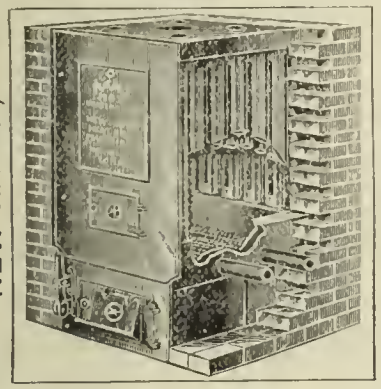
WORKMANSHIP,
CONSTRUCTION,
MATERIALS,
ADAPTABILITY,
IDEAS.

ALWAYS EQUAL TO THE OCCASION.

Send for Catalogues. Sold only to the Trade. **GURNEY HEATER MFG. CO.,** 163 Franklin St. Cor. Congress, Boston, Mass.

Selling Agents, A. A. Griffing Iron Co., 34 Dearborn St., Chicago, Western States.

NEW HAVEN HEATING



NEW HAVEN, CONN.

AND PLUMBING CO.

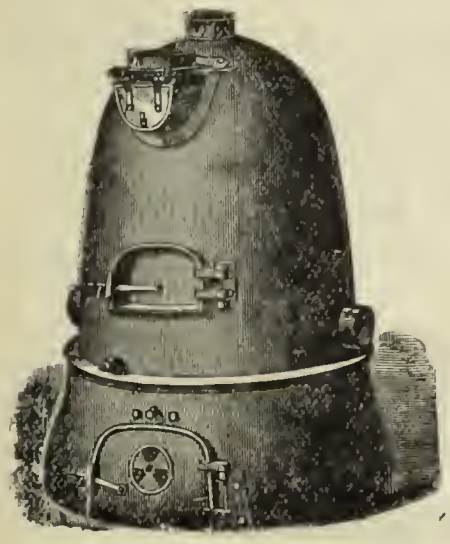
Rapid Hot Water Heater,

Selling rapidly to the Trade only.

MONEY IN IT FOR YOU.

Send for Catalogue, Price-List and Discount.

The Weathered Hot Water Heater.



MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET; - - - - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best

—FOR—

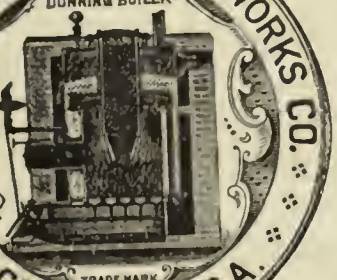
Steam or Hot Water Heating.

—o—

Send for Catalogue.

NEW YORK CENTRAL IRON WORKS CO.

THE DUNNING BOILER



TRADE MARK

GENEVA. N.Y. U.S.A.

The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

Packed Joints.

— BUSINESS.—"No," said Mr. Haicede, "I ain't goin' to pay no $10 fer this suit. It's second hand."

"Vat," shouted Mr. Achheimer.

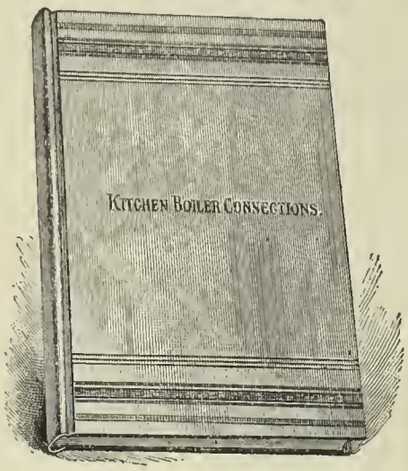
"I say it is second hand. Second hand clo'es is them that has been wore, ain't they? An' didn't I have to wear the suit when I tried it on?"

"Vat a pity," said Mr. Achheimer, in admiration, "vat a pity it vas dot you vas prought up to pe a farmer. You got a pizness head dot vas simbly owit of sight."—*Indianapolis Journal.*

— THE phonograph has been put to a novel use in London. An article is read in front of the receiving funnel and the waxen cylinder is sent to the printer, who sets it in a duplicate machine and puts the tubes in his ears. He then regulates the speed to suit himself, and sets by ear instead of by eye.—*The Press.*

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth.

Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

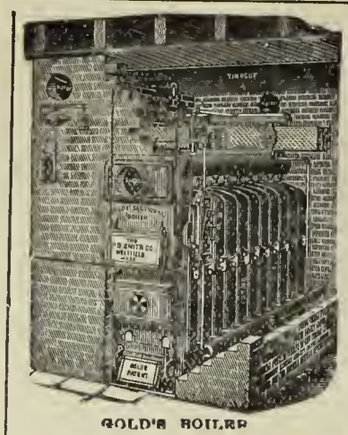
Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK



GOLD'S BOILER

THE H. B. SMITH CO

MANUFACTURERS OF

Steam and Water

Heating Apparatus

FOR

PUBLIC BUILDINGS AND PRIVATE RESIDENCES

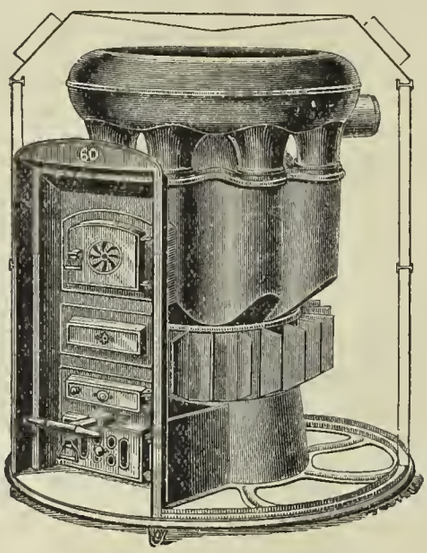
SPECIALTIES:

Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
Reed's Improved Cast-Iron Radiators,
Gold's Indirect Pin Radiators,
Breckenridge's Patent Automatic Air Valves.
Mercer's Patent Improved Sectional Boiler for Hot Water and St
Heating, adapted for hard or soft coal.

Office & Warerooms, 137 Centre Street, New Yo

FOUNDRY, WESTFIELD, MASS.

Catalogues Sent on Application



CORY'S

ALL CAST IRO

GAS-TIGHT FURNACES.

The purchaser will never ask if this the *best* quality made, as all dealers und stand the "Cory Furnace" to be only *cast iron*, without bolted joints; gas-tig and durable. Quality exactly the same twenty sizes from $35 to $125.

UZAL CORY & CO

210 Water St., New York.

Estab'ished 1847.



THE

Scollay Hot Water Heate

For Warming Dwellings, Stores, Offices, Churches, Public Buildings, &c.

Also Boilers specially constructed for Gree houses, Conservatories, Baths, Laundries, &c.

SEND FOR ILLUSTRATED CATALOGUE AND PRICE-LIS

JOHN A. SCOLLAY,

72, 74 & 76 Myrtle Ave., BROOKLYN, N. Y

STEAM HOT WATER WARM AIR
FOR HEATING ALL CLASSES OF BUILDINGS

OUR LITTLE BOOM "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

CAPITOL HEATERS

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.



WHY IS IT

that the same dealers who sold the **Boomer Furnace** five years ago are sti continuing its sale?

DID YOU EVER STOP TO THINK

that one or two years' experience with a poorly constructed light furnace alway creates a demand for a furnace that has proven to be the best in the full sens of the word?

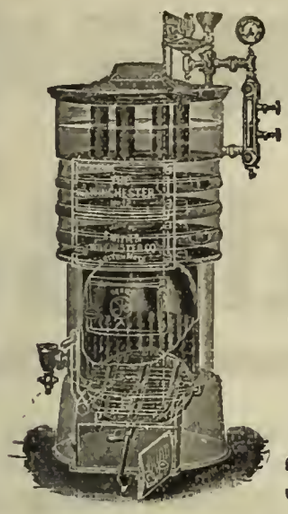
IF YOU WANT TO MAKE MONEY

buy the Improved Boomer Furnace, set it up right, please your customer, and yo have the key to your future success.

REMEMBER

that a Boomer Fire Pot has never been known to crack or burn out. That it ha the simplest and most effective Gas and Smoke Burner. Guaranteed the hea lest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS. **Massillon, Ohio**



The Winchester



Has more ***COMMENDABLE***

And less ***OBJECTIONABLE FEATURES***

Than any Heater on the Market.

——MADE BY——

SMITH & WINCHESTER CO., Boston, Mass.

Our prices on these Heaters will please you. Send for them.

KEEP IN MIND



The Plummer

Steam Heater

AND

The Leader

Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,

PUTNAM, CONN.

THE MAHONY BOILERS.



For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.

THE VOLUNTEER

STEAM



For hot water or steam has no superior, and is the only hot water boiler that is SELF REGULATING.

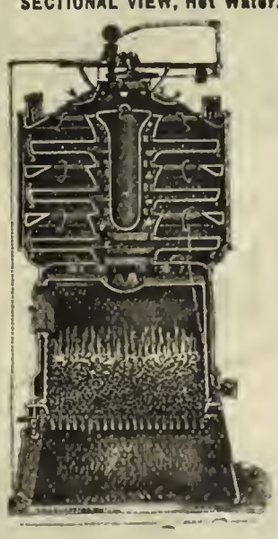
Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Street.

SECTIONAL VIEW, Hot Water.



Walking in the Rain.

"What am I going to do?" repeated the returned exile; "why I'm going to take a walk in the rain. It's a trick I learned in 'Hengland, dear boy,' and it's one of the most charming forms of exercise on top of this green earth. You see my costume; well, it's the dead copy of that in which a Cornish squire of my acquaintance used to walk in rainy weather over the downs that make up most of his estate. My laced shoes, you perceive, come well up the ankle, have heavy cork soles and have just been treated to a good rubbing-in of cold cream. I have stout woolen stockings and knickerbockers on, so as to avoid the flapping and contact of the wet trousers, and this cape mackintosh comes down pretty near to my heels. My underclothing is thick, but not heavy, and my clothes are of rough tweed that wouldn't be damaged if you'd let 'em lie in a stream for a week. Instead of a collar I wear a light silk scarf around my neck, over which I turn my coat collar and button it up so. This hat is a water proof fore and after. Umbrella? Why, of course not. That would destroy the very spirit, the very joy of your experience—which is to feel the rain beating in your face, the wet wind whistling about your ears, and the weather banging you about generally. You may not like it at first, but you soon will; and then you'll find there is a sort of wild joy about the thing that you can't resist. Catch cold? Why, of course not. In fact a course of walking in the rain is one of the best preventives against taking a cold. So long as you're moving briskly there's no danger of taking cold, no matter how wet it may be. It's the standing or sitting in wet things that's so dangerous, and so you must just walk from the time you leave the house until you get back; and then, when you do get back, strip off everything and give yourself a good rub. And if, as you put on your dry things, you do not feel like a new man with a new zest for the struggle of life, then I don't know a banana from an express wagon."—*Exchange.*

— When a man is through with his day's work and is sitting down resting in the home, he cannot read the advertisements on the fences, and the hand bills and circulars that were left on his door step during the day have been blown away or destroyed.—*Exchange.*

—"That was a very reasonable request the Rev. Mr. Whitetie made last Sunday."

"What was it?"

"He requested that no buttons be contributed for the heathen without garments attached to them."—*Herald.*

Worth and Be

Benson, the author, says: "Above all, bew
added to specially favored wares, rather than an
driven by the plowman to the glorious cathedral tow

The best designers are emp
stoves and ranges, so besides b
are handsome and symmetrical.

GARLAND STOVES AND RANGES

"The World's Best"

auty combined.

e of the suggestion that beauty is a thing apart, to be
sential in all right workmanship, from the furrow
ring over the ancient city."

loyed on patterns for "Garland"
ing convenient and durable they

Every desirable size and style,

For all kinds of fuel,

All of one equal and uniform grade of merit.

Prices no higher than is asked for other first-class makes.

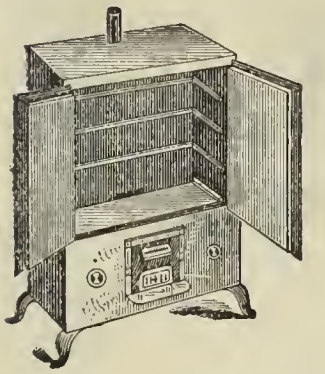
The Michigan Stove Company,

Largest Makers of Stoves and Ranges in the World.

ROIT, CHICAGO, BUFFALO, NEW YORK CITY.

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



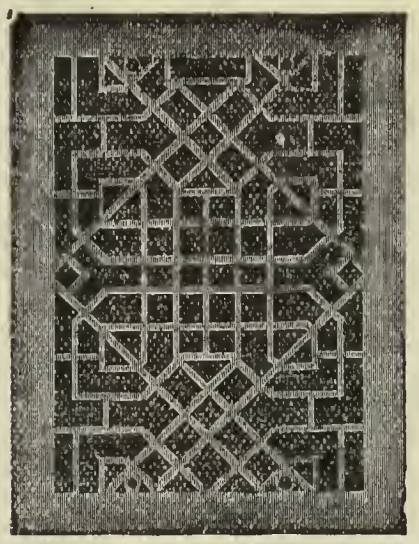
Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.
Burlington, Vt.



Warm-Air Registers, Ventilators, Etc. Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.



— CONCERNING FUEL.—Jinks: "How do you buy your coal?"

Spinks: "By the cartload."

Jinks: "How much does a cartload weigh?"

Spinks: "I don't know, but I suppose it varies according to the size of the driver."—*Detroit Free Press.*

—THE RATES ARE LOWER.—She: "What is your favorite month in the country?"

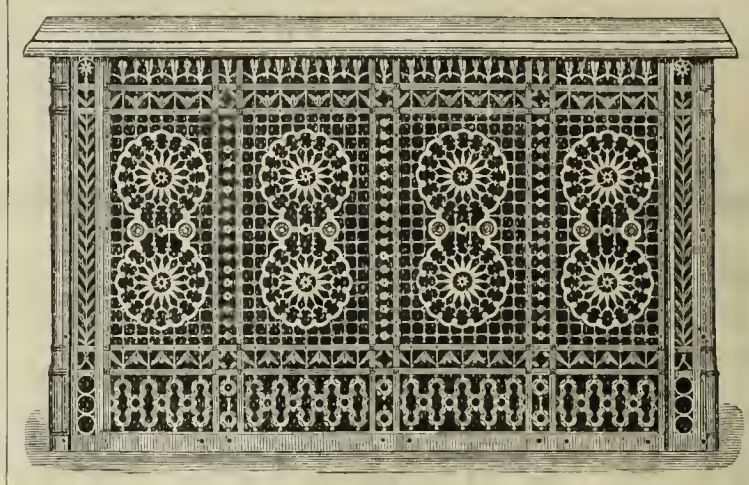
He: "October."

"Ah, you appreciate Nature's autumnal symphonies in color?"

"Y-e-s; and, besides, the rates are lower."—*New York Weekly.*

TUTTLE & BAILEY MFG. CO.,

REGISTERS, VENTILATORS, &c.



No. 5 SCREEN.

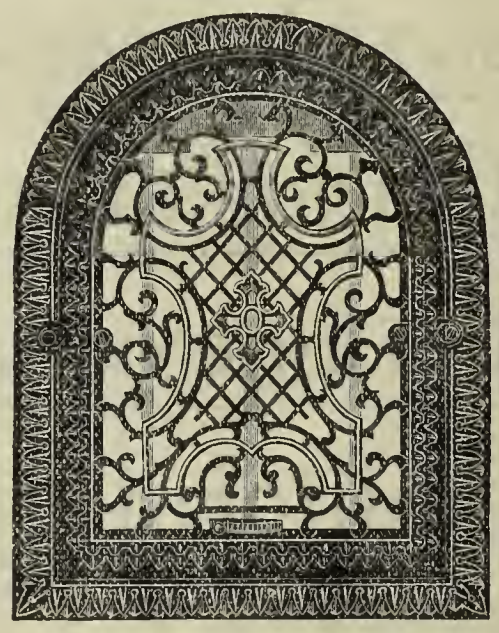
REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.

WM. HIGHTON & SONS,

MANUFACTURERS

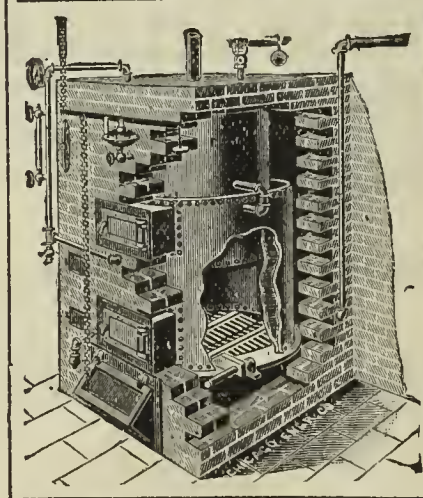
Hot Air Registers,



Ventilators, Etc.

CIRCULAR TOP REGISTER
With Wall Frame.

BOSTON, MASS., - and - NASHUA, N. H.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use HARD or SOFT COAL.

BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

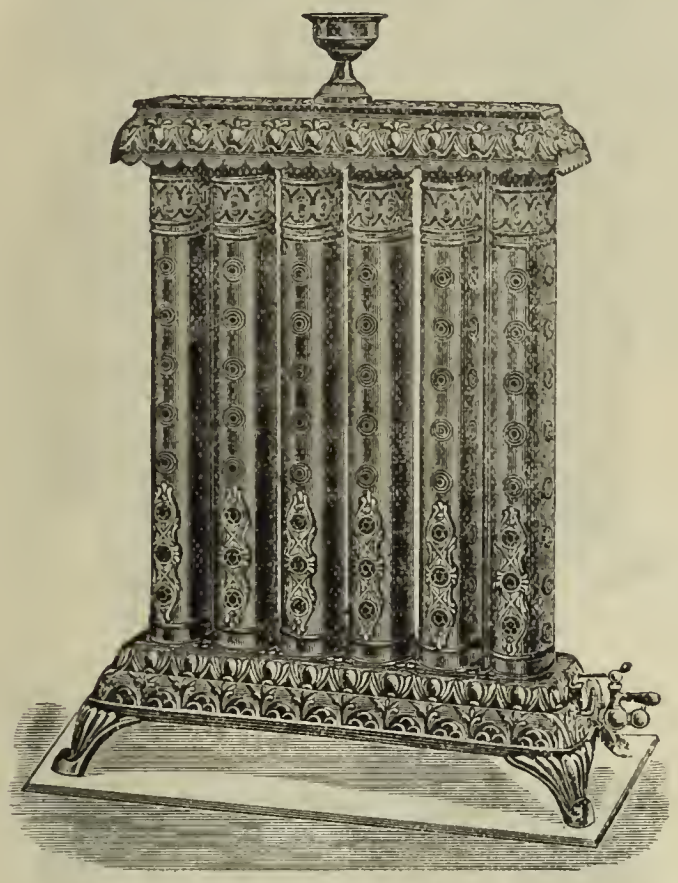
Write us for New Catalogue and Prices.

BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96–102 Reade Street, New York.

NO DULL SEASON WITH US.

We Did a Larger Business in 1894 Than Any Previous Year.



We know what the People want and make our goods to suit them. Our Gas Radiators are meeting with a great sale, and they are given the preference wherever they have been used.

WHY? Because they possess more real merit, give better satisfaction, are easier managed, handsomer in appearance, and burn less gas for the quantity of heat given than any in the world.

The WINTER IS NOT OVER YET. If you do not know all about them write at once, order samples, and be in the swim.

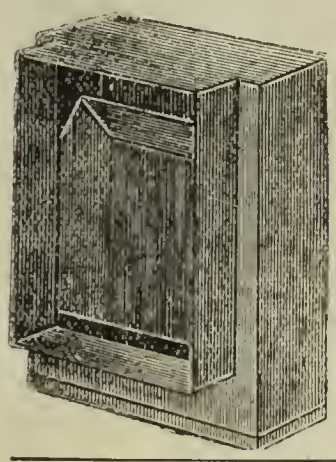
We also manufacture a full line of Gas Heating and Cooking appliances and Oil Heating Stoves.

Correspondence Solicited.

FIRE KING GAS STOVES & RANGES TRADE MARK BEST IN THE WORLD.

A. Weiskittel & Son, Baltimore, Md.

We Have the Largest Gas Stove Factory in the World.



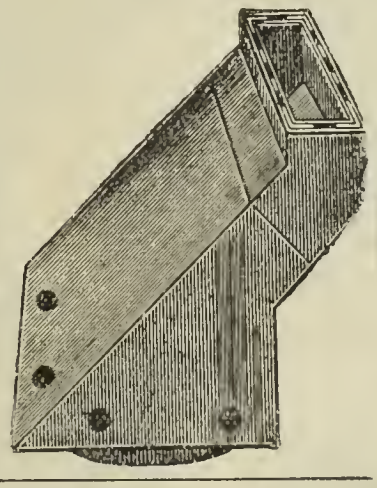
Novelty Ventilated Wall Pipe,

Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER
18 Wood Street Pittsburgh, Pa.



NEW HAMPSHIRE MICA IS THE BEST.

The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Propr.,
89 Fulton St., N. Y.

MICA | MICA OF ALL GRADES —FOR— Stoves, Electrical and Mechanical Purposes.

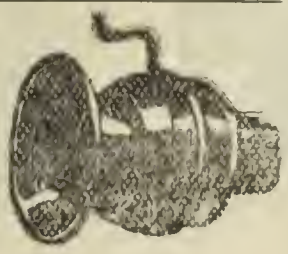
PALERMO MICA CO.,
Miners and Importers and Wholesale Dealers,
S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.

MICA NORTH CAROLINA, WYOMING, AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.



W. R. OSTRANDER & CO.,
204 FULTON STREET, NEW YORK.
Manufacturers of
Speaking Tubes, Whistles, Elbows, Call Annunciators, Bell and Electric Wire Tubing.
Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, [illegible] Ave., near Knickerbocker, Brooklyn, L. I. [illegible] on application.



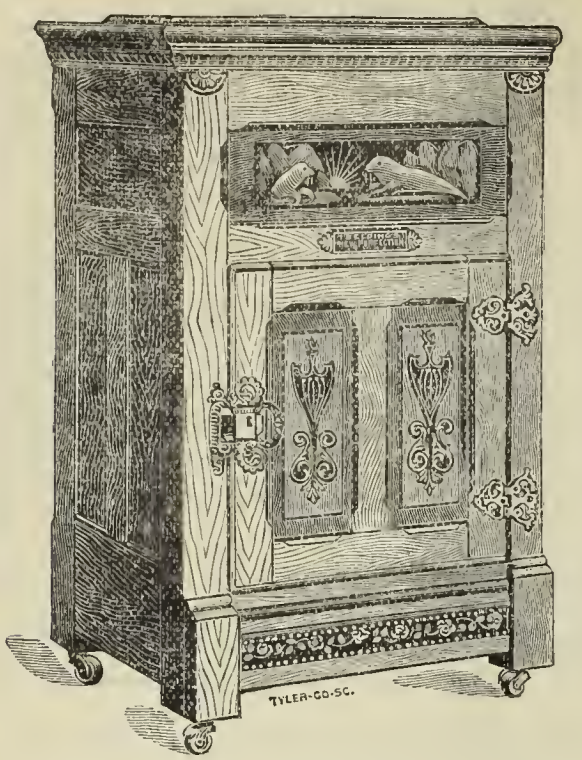
— STRANGER: "Would you kindly show me the way to the cathedral?"

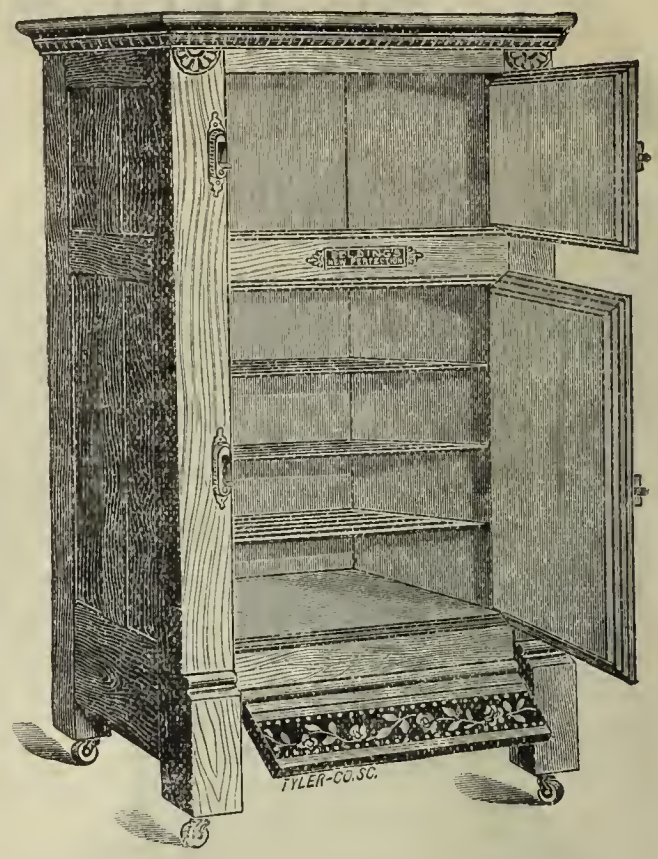
Intelligent Native. "That is not difficult to find. You just walk down that street yonder, and at the further end you will see a small provision shop on your left. The cathedral is exactly opposite."—*Fliegende Blätter.*

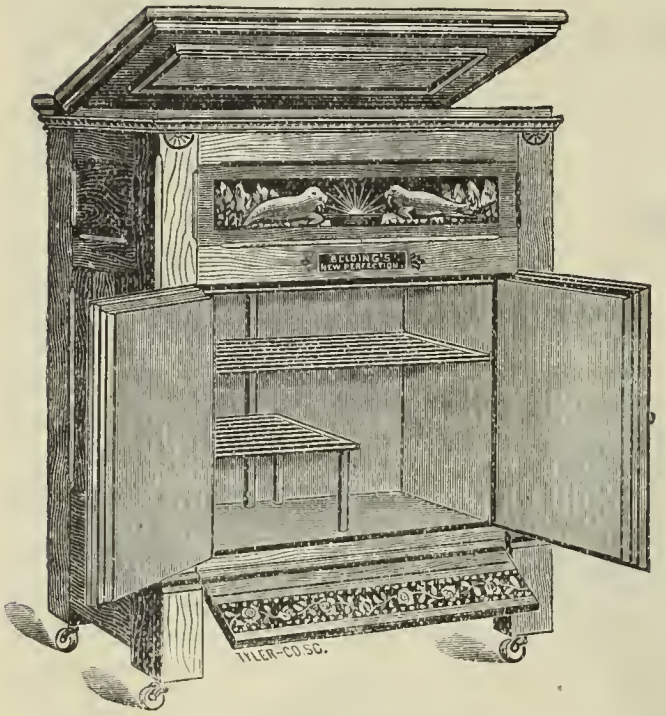
— THE REASON.—"Why do they call the living skeleton the Napoleon of the dime museum?"

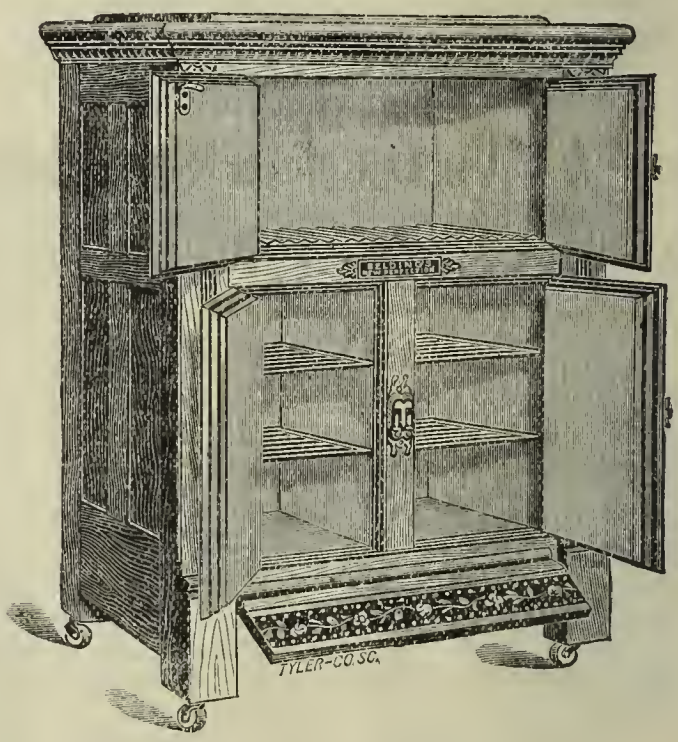
"Because he is the bony part of the show."—*The Press.*

— A CHAPEL in honor of St. Paul gave a new name to the Minnesota city. It was originally called Pig's Eye, from a nickname given to a one-eyed Frenchman who kept a drinking shanty at the place.—*The Press.*

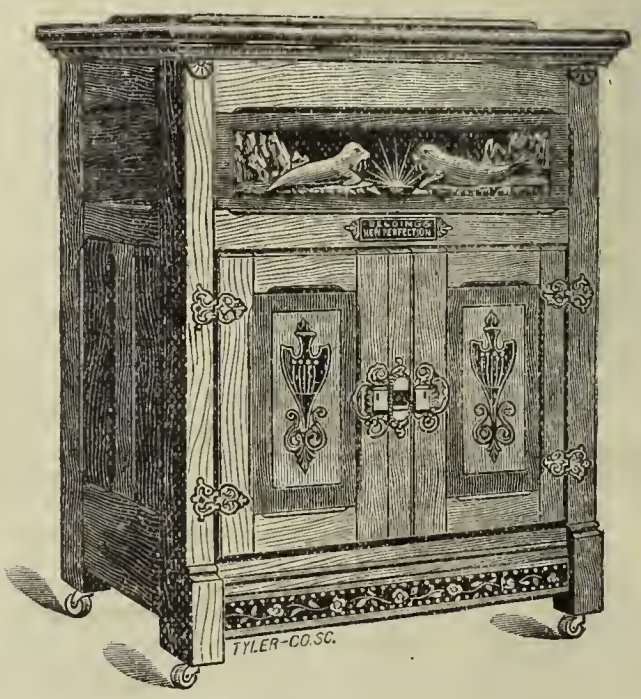

TYLER-CO.SC.

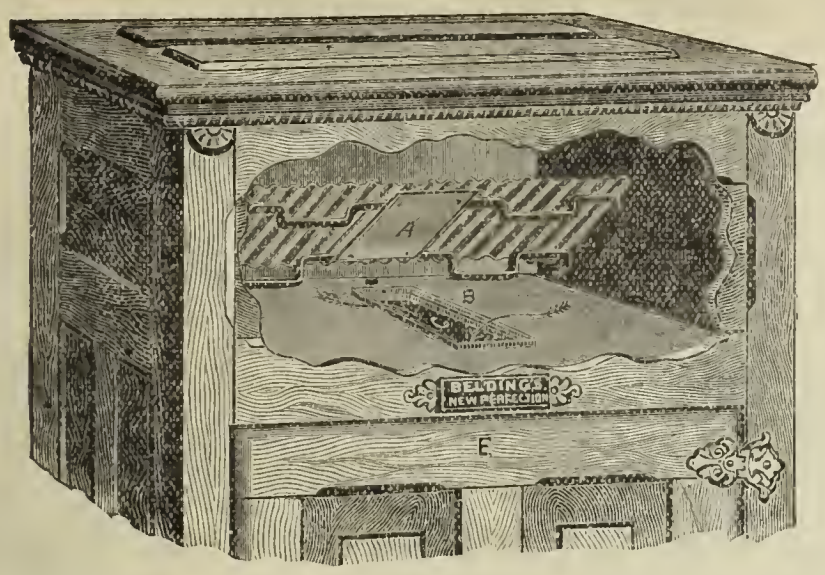

TYLER-CO.SC.


TYLER-CO.SC.

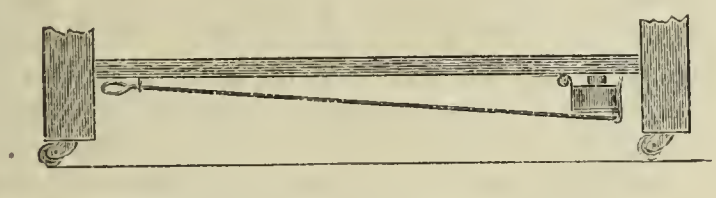

TYLER-CO.SC.

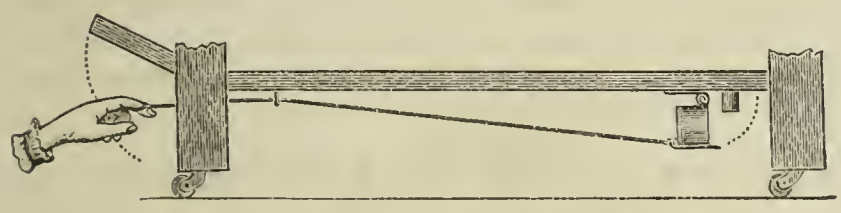

TYLER-CO.SC.

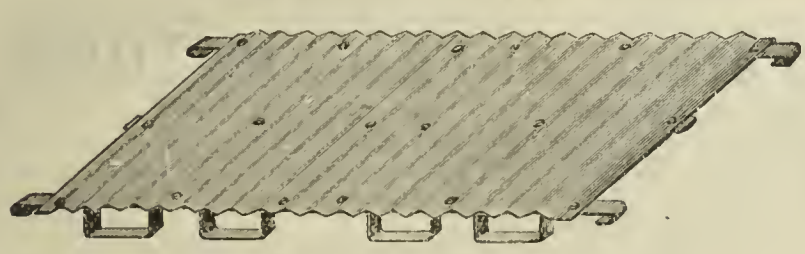

TYLER-CO.SC.

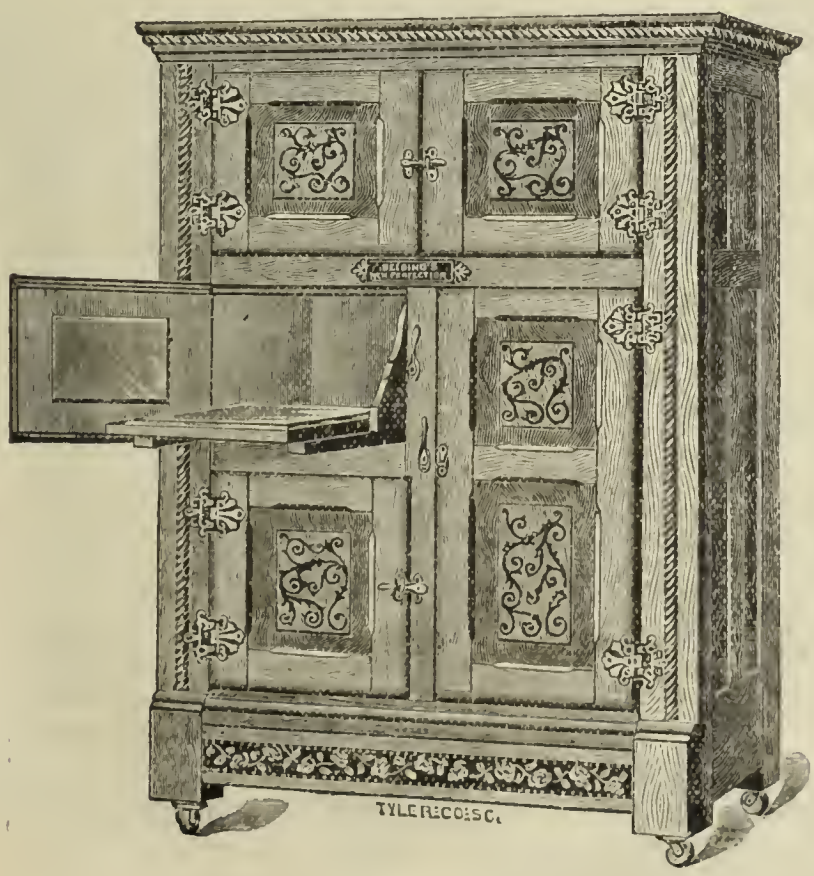


Patent Applied For.









See Points of Excellence Over Others.

☞ OUR NEW AUTOMATIC COLD AIR DAMPER ATTACHMENTS.

☞ OUR NEW DRIP CUP ATTACHMENT.

☞ SOLID METAL ICE RACK.
No wood cleats to get water soaked and tainted.

All refrigerators **hardwood, antique finish.** We carry large stocks at all of the following places :

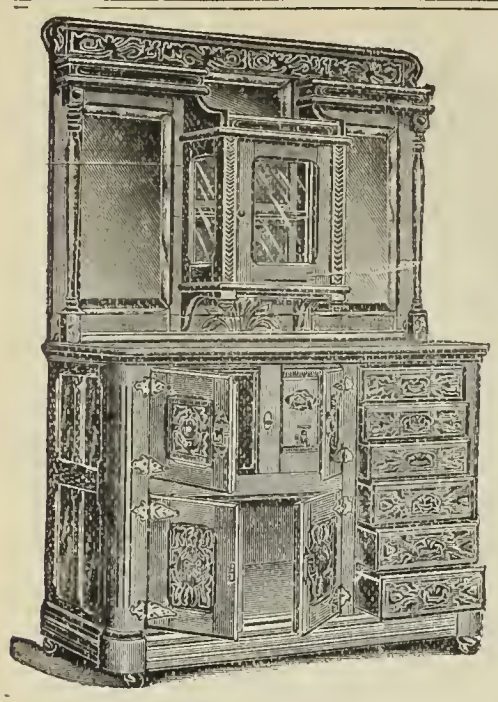
Belding Manufacturing Company.

Factories, Belding, Mich.

SALESROOMS AND WAREHOUSES :

Chicago, 223 5th Avenue.
New York, 260 Canal Street.
Philadelphia, 249 So. 2nd Street.
Boston, 90 Canal Street.
Holbrook, Merrill & Stetson, San Francisco and Sacramento, Cal., Pacific Coast Agents.

SEND FOR ILLUSTRATED CATALOGUE.



GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co , Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.
Lee-Clarke-Andreesen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Wm. Miller Range & Furnace Co., Cincinnati, O.
Doggett Dry Goods Co., Kansas City, Mo.

BUY THE BEST.

—THE—

Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,

GRAND HAVEN, MICH., U. S. A.

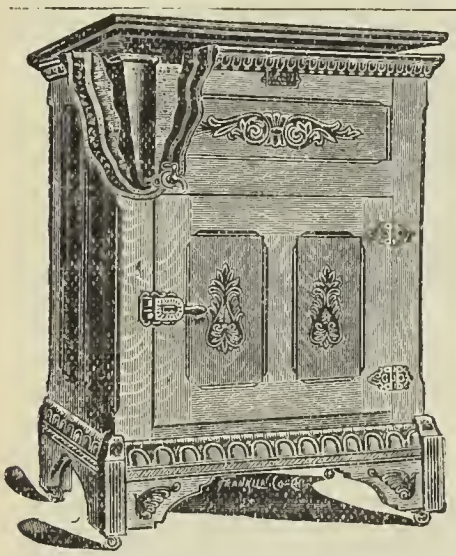
Write for our large Illustrated Catalogue for 1895.

All our goods are made of thoroughly kiln dried ash, finished in antique with Shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups All Refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

THE CHALLENGE ICEBERG,

THE .·. HONEST .·. RELIABLE .·. REFRIGERATORS,

SELL THE BEST.



No. 102 Refrigerator. Front sectional view, showing position of Removable Galvanized Ice Compartment, Mineral Wool Packing, Etc.

Gurney Patent REFRIGERATORS.

WE CLAIM FOR THE "GURNEY:"

"REMOVABLE GALVANIZED ICE COMPARTMENT."
"THE ONLY CLEANABLE REFRIGERATOR."
"CAN BE KEPT ABSOLUTELY PURE AND CLEAN FOR ALL TIME."
"THE LOWEST AVERAGE TEMPERATURE."
"THE GREATEST ECONOMY OF ICE."
"DRY AIR FREE CIRCULATION."
"PACKED WITH MINERAL WOOL (the best non-conductor.)"
"THE GREATEST SELLER."

The "Gurney" Proves what we Claim.

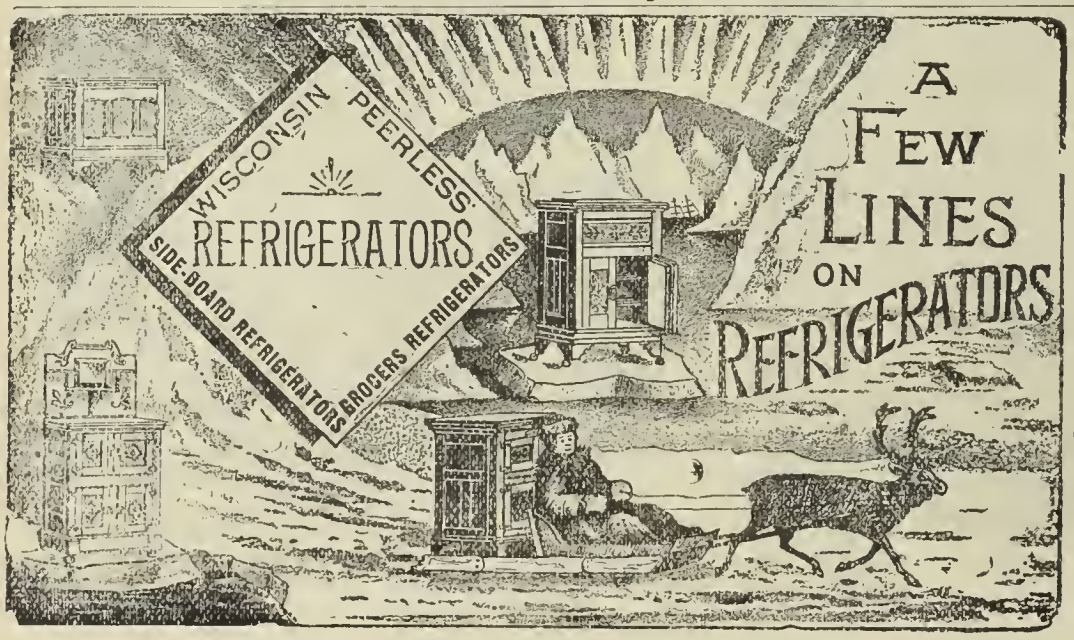
The following Jobbers will handle the Gurney for the Season of 1895:

S. M. Howes & Co., Boston, Mass.
A. W. Martin, Baltimore, Md.
Supplee Hardware Co., Philadelphia, Pa.
Bindley Hardware Co., Pittsburgh, Pa.
Frank Diel, Syracuse, N. Y.
McIntosh-Huntington Co., Cleveland, O.
Indianapolis Stove Co., Indianapolis, Ind.
Chicago Stove & Range Co., Chicago.
Freeman Delamater & Co., Detroit, Mich.
Robert Seeger, St. Paul, Minn.
A. J. Lindemann & Hoverson Co., Milwaukee, Wis.
King Hardware Co., Atlanta, Ga.
O. K. Stove & Range Co., Louisville, Ky.
Heckel Hardware Co., St. Louis, Mo.
Howard W. Peak, Fort Worth, Texas.
Richards & Conover Hardware Co., Kansas City, Mo.
Tolerton & Stetson Co., Sioux City, Iowa,
Rector & Wilhelmy Co., Omaha, Neb.

LLEWELLYN BONHAM, our New York representative,
Room 52 Pierce Building, N. W. corner Hudson and Franklin Streets.

We want a jobber in every distributing point in the United States, and a dealer in every town and city. Write for catalogue, terms and discounts, and secure the agency.

Gurney Refrigerator Co., Fond du Lac, Wis.



FROM DEALERS LOOKING FOR THE

Best Refrigerator Made

We solicit an opportunity of presenting the merits of our

"Wisconsin Peerless."

Mineral Wool Filling. Absolutely cleansable. More and better talking points than all other makes combined. Absolute guarantee. Seventh season.

For Catalogue address

The Wisconsin Refrigerator Co.

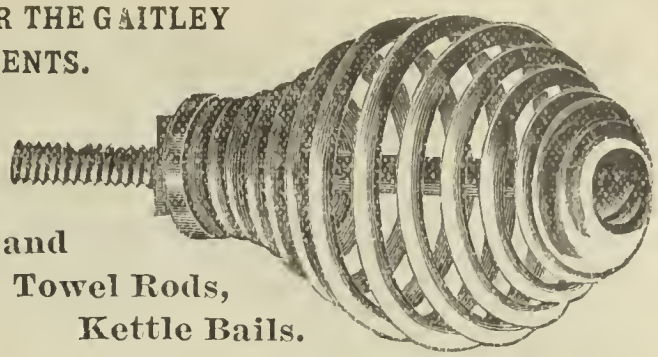
EAU CLAIRE, WIS.

New England Office,
175 Hanover Street, BOSTON, MASS.



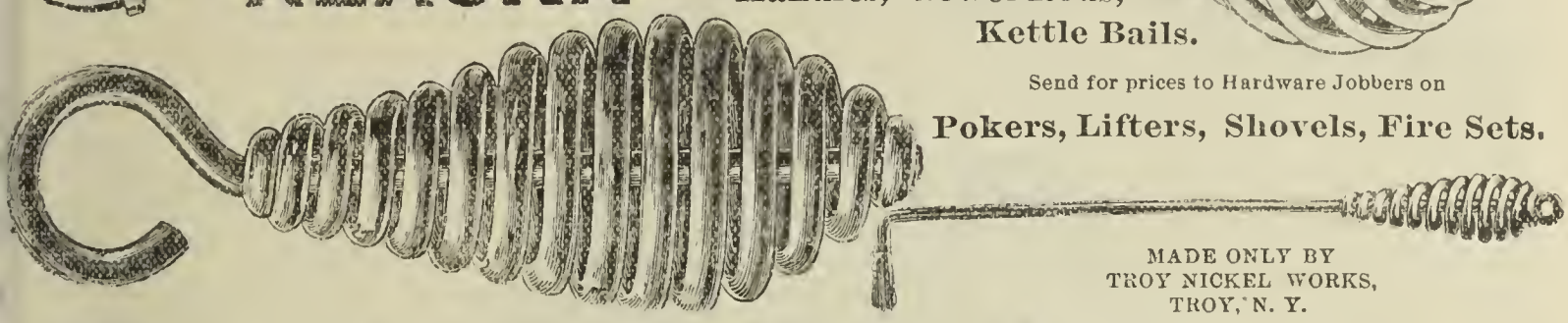
MADE UNDER THE GAITLEY PATENTS.

ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.



Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.



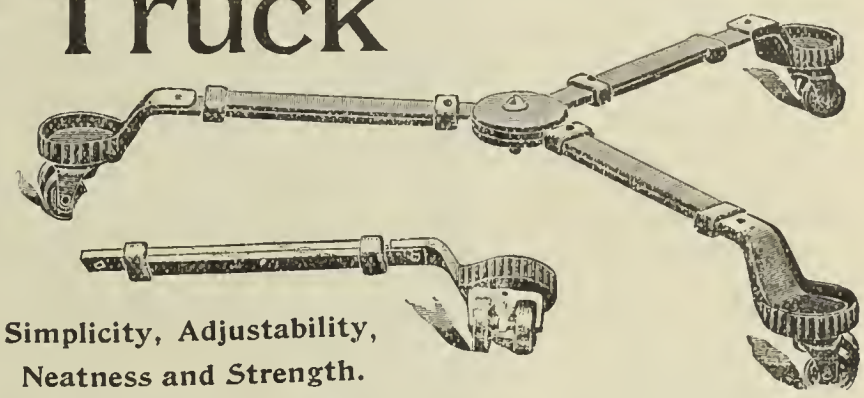
MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

Gem Stove Truck

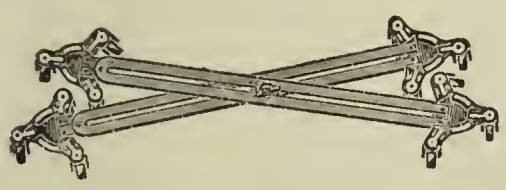
Not only accommodates itself to a stove with four legs, but, as shown in illustration, is equally as complete with a stove of three legs, a feature no other truck possesses. The adjustment is so perfect that one man can mount any ordinary stove with ease. Price, $30.00 per dozen. 1-3 doz. in neat case.

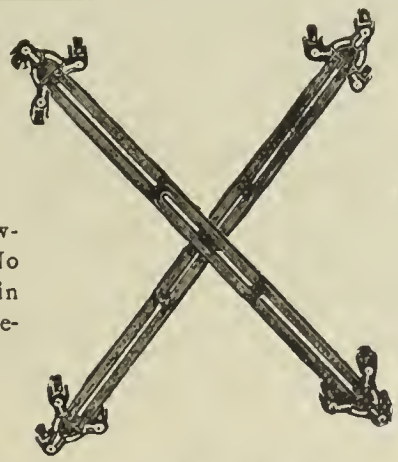
DISCOUNT TO THE TRADE.

Address **CHAS. F. FOX, - DAYTON, O.**



Simplicity, Adjustability, Neatness and Strength.

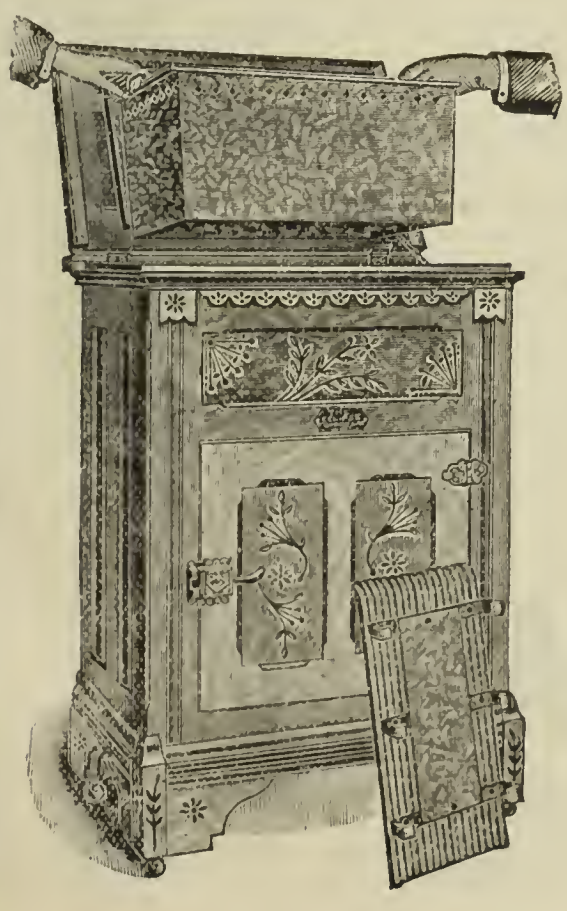




THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.



THE ECLIPSE HARDWOOD REFRIGERATORS.

Patented Separable and Removable Ice Compartment.

Can be kept perfectly clean with the least trouble.

It will pay you to write for Catalogue and secure the agency.

—THE—

Bowen Manufacturing Co.,

FOND DU LAC, WIS.,

SOLE MFRS.

Board School Answers.

Pages might be filled with the answers given by the board school scholars. Here are a few specimens of the humor, conscious or otherwise, of these young folk:

"Faith is belief in what can't happen; Hope is belief in what won't happen; and Charity is belief in what does happen."

Does not this sound like an example of the new humor? It is in reality a genuine school board answer culled from an examiner's notebook.

"The act of uniformity," said a little girl, "was to make everybody go to bed at the same time."

"The kings of Israel," said a budding theologian to a reverend examiner, "must have been poor because it is stated that they slept with their fathers. If they had been rich they would have had beds of their own."

"Why is it wicked to cut off dogs' tails?" asked the teacher.

"Because what God hath joined let not man pull asunder," came the quick reply.

"Jerusalem was surrounded by walls to keep the milk and honey out."

"The cities of refuge were intended for those who had unintentionally committed suicide."

"Titus was an apostle who wrote epistles. He was the Emperor of Rome, and his surname was Oates."

"The hydra," said a little maid of five once, "was wedded to Henry VIII. When he cut off her head another one sprung up."

"The United States is governed by machinery" (who can deny it?).

"St. Peter was crucified head downward, because he mentions it."

"What were the Jewish feasts?"

"Beanfeasts," was the prompt reply.

"Mention an instance of charity in the Bible."

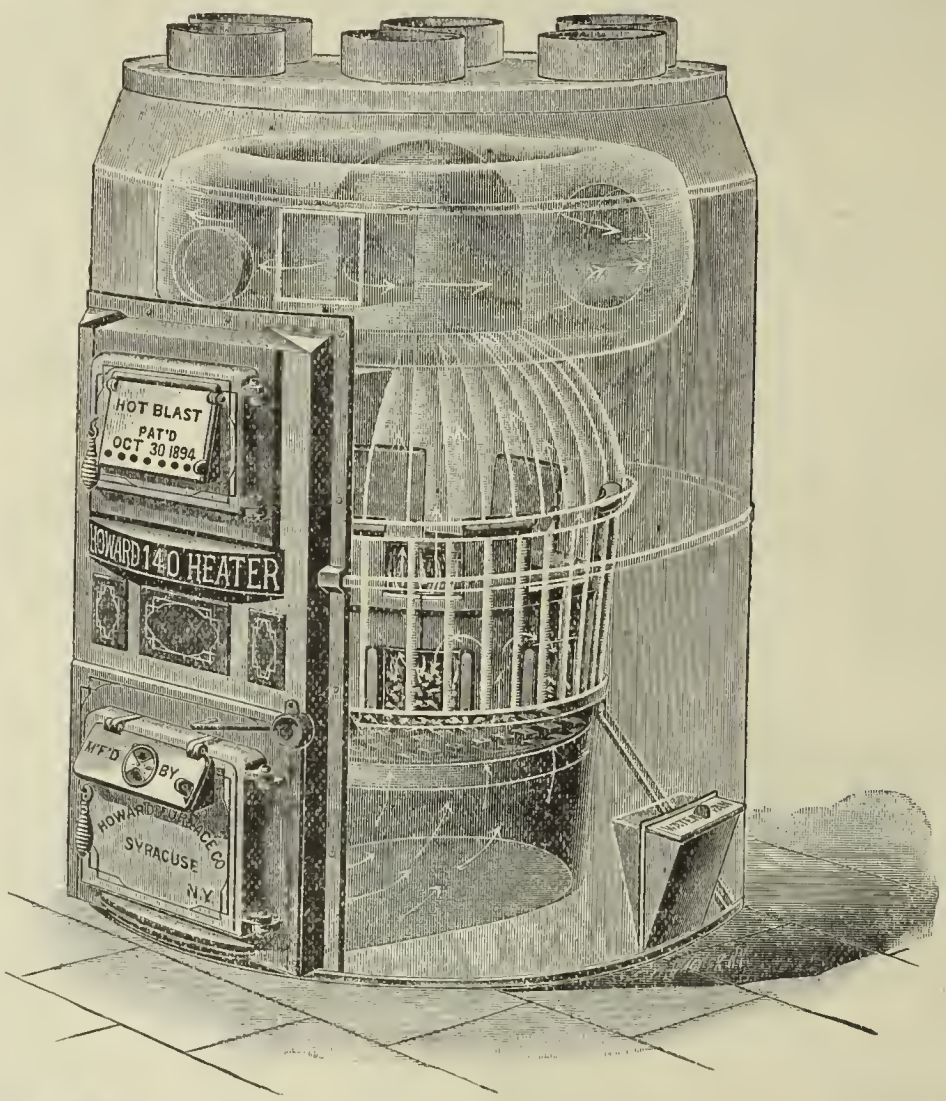
"They brought Him a penny, and He said, 'Whose subscription is this?'"—*Westminster Gazette.*

— "He lived retired, I know, but he surely left some friends behind him?"

"Not a friend; only a widow."

HOWARD FURNACES

For Burning
Soft Coal.



For Burning
Soft Coal.

DO YOU

RECOGNIZE THESE IMPORTANT FACTS WHICH THE HOWARD SOFT COAL FURNACES HAVE ?

SIMPLICITY OF CONSTRUCTION.
EASE OF ADJUSTMENT.
GUARANTEED CAPACITIES.
BLAST IN SEGMENTS AND EASY TO RENEW.

HOWARD FURNACE CO.

Main Office and Works, **Syracuse, N. Y.**

NEW YORK, BOSTON, GRAND RAPIDS, TORONTO.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 5, 1895.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO. .....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND .....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 1.
Index to Reading Matter.....Page 57.

Retrospective.

The year 1894 has dropped into the past, and its departure is regarded with a feeling of relief by the many to whom it brought little else than disappointment and discouragement. It will long be remembered as the year of exceptional business depression and trade dullness. Following on a "panic year," its opening found the business interests of the country in a condition of extreme exhaustion, from which they have been for the past 12 months struggling to recover, through many and diverse hindrances. The close of the year offered, in many respects, a much more encouraging outlook than was presented at the end of 1893. The prospects were very gloomy at that time; but since then several causes of uncertainty have been removed and the country has overcome such obstacles as show its extraordinary power of recuperation in the face of difficulties and disasters and give hope and promise of better things in the new year. A casual glance at the happenings of the past year which bore more particularly on general business shows how eventful a year 1894 really was. The tariff and currency questions were those which exercised the most potent influence on the course of trade. The tariff was practically settled with the passage of the Wilson-Gorman bill, in the late summer, after a protracted and exasperating discussion in the Senate, during the course of which trade was almost paralyzed. It passed too late to favorably affect the fall trade to any great extent, and dullness and depression marked the remainder of the year.

Finance and Other Matters.

The currency question is still pending, but largely robbed of its terrors. The attempt to coin the seigniorage was frustrated by the President's veto, thereby removing one cause of possible trouble. The large shipments of gold abroad and the depletion of the Treasury reserve have been matters of constant anxiety during the whole year. The shrinkage in the Government holdings of the metal has been met by two bond issues of $50,000,000 each, and a third issue of a like amount is now talked of. Railway earnings have shown a terrible falling off, but this has been largely met by reductions in the operating expenses of the roads. Money has been a drug on the market, and speculation in stocks and bonds has reached only about one-half its normal volume in this market, notwithstanding the unprecedentedly low interest rates of money. Wheat, cotton, iron and other staples have sunk in price down to a level never hitherto dreamt of, diminishing the purchasing power of the producers and so affecting all trade in manufactured products. Added to these influences of depression were the great labor strikes of the summer in the coke and coal mining and railroad industries. At one time the transportation facilities of a great part of the country were held entirely in check, and the troubles reached such a serious pitch as to threaten a veritable revolution, requiring the aid of the Federal troops for its suppression. On the top of these troubles came the failure of the corn crop, and consequent losses to the farmers and the railroad companies which handle that crop. Besides these losses there were vast forest and prairie fires, floods and other disasters in various parts of the country, which wiped out an immense amount of property and caused distress and pecuniary ruin to a multitude of people. Truly this heavy catalogue of troubles was enough for one year, and we have reason for supreme thankfulness that the country has emerged into the new year in such good shape. May 1895 bring compensation to the disappointed in the shape of stimulated trade and commerce and renewed industrial activity.

Our American Tin Plate Lists.

In this issue is printed our third quarterly list of American tin plate works, together with an alphabetically arranged list of the domestic brands of tin and terne plates now on the market. The information therein given is compiled from reports kindly furnished by the manufacturing firms to *The Metal Worker* within the last ten days. They are therefore as accurate and comprehensive as possible. These lists have been found very useful by our readers, and we have endeavored to make them as complete as possible. The present exhibit contains the names of a number of new works now in course of erection, and fairly shows the condition of the tin plate manufacturing industry in general at the close of the year 1894.

Business Mortality in 1894.

The record of the business failures during the year 1894 of course shows a striking contrast with the stupendous aggregate of the panic year 1893. The number of mercantile failures in 1894 was still large, being 12,721, against 15,560 in 1893, but they were far smaller. The figures compiled by *Bradstreet's*, which refer only to those concerns whose actual assets were smaller than their liabilities, show that the assets declined from $262,415,851 in 1893 to $79,755,067 in 1894, and the liabilities from $402,427,818 in 1893 to $149,595,434 in 1894. The percentage of assets to liabilities has declined from 65 per cent. in 1893 to 53 per cent. in 1894, which is chiefly due to the fact that during the panic year business houses which would be solvent under ordinary circumstances were forced to succumb.

Bradstreet's groups the number of failures as follows:

Number of Failures.

States.	1894.	1893.
Eastern	1,784	2,139
Middle	3,018	3,415
Western	2,885	4,371
Northwestern	1,247	1,630
Southern	2,202	2,419
Pacific	1,182	1,202
Territories	403	384
Totals	12,721	15,560

The assets in the different groups stood as follows:

Assets of Failed Business Houses.

	1894.	1893.
Eastern	$7,826,381	$23,867,874
Middle	26,421,055	74,119,915
Western	18,132,474	81,003,224
Northwestern	8,824,874	42,626,570
Southern	11,623,102	24,780,822
Pacific	5,719,936	13,505,493
Territories	1,207,245	2,511,953
Totals	$79,755,067	$262,415,851

The liabilities grouped in the same manner show the following totals:

Liabilities of Failed Business Houses.

	1894.	1893.
Eastern	$18,790,018	$45,465,110
Middle	51,493,787	124,381,173
Western	30,138,654	109,485,547
Northwestern	15,201,215	62,375,448
Southern	21,285,698	38,478,231
Pacific	10,608,257	18,268,459
Territories	2,077,805	3,973,850
Totals	$149,595,431	$402,427,818

A curious fact is brought out by the returns, and that is, that the number of concerns in business declined during 1894. It passed one million in 1891, being 1,010,000, rose to 1,035,000 in 1892, increased to 1,050,000 in 1893 and then dropped to 1,047,000 in 1894.

An interesting comparison is also made concerning the bank suspensions during the two years under review. Within two years 174 national banks closed their doors, temporarily or otherwise, owing $73,718,000 and having $89,184,000 to pay it with, a large proportion of them resuming business. In the same two years 219 State banks shut down, permanently or otherwise, owing $40,887,000 and having $45,409,000 assets. Private banks present a total of 220 closed within two years, with liabilities of $28,935,000 and assets of $27,828,000. The 56 savings banks reported embarrassed by the panic year 1893 and during 1894 show total debts of $18,846,000 and assets of $19,307,000. Loan and trust company embarrassments within two years number, as reported, 17, with $23,400,000 liabilities and $14,867,000 assets.

THE LETTER BOX.

Galvanizing Iron Castings.

From A. & S., *Penn Yan, N. Y.*—We would like to be informed through the columns of *The Metal Worker* of a good formula for galvanizing small iron castings, just as they come from the rattler.

Answer.—The process of galvanizing, though an easy one in theory, requires considerable practical knowledge and experience to produce satisfactory results. The pot for holding the melted zinc is usually made of wrought iron and should be very heavy to be of sufficient strength to hold the contained zinc. The pot, as a rule, is set in brick, supplied with a coke fire about the bottom and sides, and should contain a sufficient amount of zinc so that the temperature will not be rapidly reduced as the articles are immersed. The surface of the zinc is covered with powdered sal-ammoniac to protect it from the action of the atmosphere, and also to act as a flux. An addition of about 3 per cent. of tin to the zinc improves the appearance of the work. The molten zinc gradually takes up iron from the pot and from the articles galvanized. This formation being heavier than zinc, sinks to the bottom of the kettle while in a melted state and at rest. The action of dipping mixes the alloy with the zinc and gives a rough appearance to the work. As a remedy, the melted zinc should be allowed to stand until the alloy has settled to the bottom of the kettle, when it can be removed by means of a perforated iron skimmer. As the sal ammoniac and atmospheric oxygen act to a certain extent on the molten zinc, a scum is formed which must be removed from time to time. The sal-ammoniac covering the zinc is also vaporized during the process of galvanizing, and additions are to be made as required. The first step to be taken with the castings is to remove the outer scale or oxide, and much of this can be done with the rattler. If the castings are sufficiently clean for galvanizing, well and good; if not, they can be scoured with sand or coke. As much of the success of the operation depends on a clean surface, it may be neccssary to place the castings in a bath of sulphuric acid and water. If desired, the articles can be kept for some time after cleaning by being covered with pure water. They can then be dipped in muriatic acid, dried in a reverberatory furnace, or on a sheet of iron placed over a fire. While hot the castings are taken and placed in the melted zinc, and allowed to remain for a short time, when they are taken out, the superfluous zinc being allowed to drain off, or removed by brushing. Small castings can be taken out of the zinc by means of an iron skimmer. They must be separated before cooling so they will not stick together.

Pipe for Heating Water.

From S. B. C., *New Orleans, La.*—The tank is to be constructed of a capacity to admit of 40,000 pounds of water per hour passing through it. The water system is to contain 10,000 pounds, and to pass through the tank four times an hour. The water is supposed to be heated to 160° at its entrance to the tank, and is to leave the tank heated to 210°; in other words, to be increased 50° in temperature. The question is, how many feet of 1-inch pipe will be required to give the requisite heating capacity from steam? The size of the boiler is supposed, of course, to be sufficient to supply the necessary amount of steam. The tank can be made in any way that suits the engineer's fancy. The one thing desired is to heat the water under the conditions above given.

Answer.—With steam at any pressure per square inch, vertical inch pipe heating surface will transmit 76 heat units per hour for each Fahrenheit degree of difference between the interior steam and the exterior liquid, and horizontal each pipe will transmit 110 heat units. The total number of heat units to be transmitted is practically found by multiplying the weight of water—in the present case 40,000 pounds—by the number of degrees its temperature is to be raised, in the present case 50° F.

$$40{,}000 \times 50 = 2{,}000{,}000,$$

which is the number of heat units the pipe will have to transmit.

The total difference of temperature with steam at 212° (assumed to be the temperature at which steam passes through the pipes) is 212° − 160° = 52° F. But assuming that the water is run into the tank in a body at 160° F. and raised to 210° by the steam pipes, the temperature within the pipes will remain constant while the temperature of the water will be gradually raised. The average temperature of the liquid will therefore be 185°, and the average difference of temperature will be 212° − 185° = 27° F. As each foot length of vertical pipe will pass into the exterior liquid 76 heat units per hour for each degree of mean difference of temperature, $27 \times 76 = 2052$ heat units, and $\frac{2{,}000{,}000}{2052} = 975$ feet run if the pipes are arranged vertically. Similarly, $27 \times 110 = 2970$, the number of heat units each foot in length of horizontal pipe will pass into the liquid hourly, and $\frac{2{,}000{,}000}{2970} = 674$, the number of feet of horizontal inch pipe needed.

If live steam be used less pipe will be needed, depending upon the pressure carried. But exhaust steam will be available, and is generally used for heating liquids when it can be so used, and it is economical practice to do this. The exhaust from a 70 horse power engine using 30 pounds of water per horse-power per hour would do this heating; and in general every pound of exhaust steam gives off 966 heat units in heating water; therefore $\frac{2{,}000{,}000}{966} =$ 2070, which is the number of pounds of exhaust steam required.

Evans Hot Air Furnace.

From B. C., *New York.*—Can any reader of *The Metal Worker* tell me where the Evans hot air furnace is manufactured, or whether it is at present on the market?

The new British torpedo boat destroyer "Ferret" is, says an English service journal, simply a box of machinery from end to end. Her length is slightly in excess of the old time line of battle ships, and her beam is one-third less. Under forced draft she can be driven at a speed of about 27 knots per hour. Armed with two quick firing guns and four torpedo tubes, she can pursue and overtake the swiftest torpedo boat afloat, and with her more powerful gun fire, destroy her. Four funnels, four boilers, triple expansion engines, making at their highest speed some 400 revolutions per minute, steam steering apparatus, and machinery for working anchors and cables, all crowded into the narrowest limits, make up this result of modern mechanical engineering and shipbuilding skill.

A Jacksonville special asserts that the severe frost of last week will entail a loss of about $3,000,000 to the fruit growers of Florida.

A statement of the capital invested in and the value of the annual product of each manufacturing establishment at Muncie, Ind., compiled by a Cincinnati newspaper, places the aggregate capital at $4,402,000 and the annual product at $11,572,000.

It is stated that the railroad suspension bridge at Niagara Falls is to be superseded by an arched cantilever structure. It is also understood that the 1200-foot roadway suspension bridge near the falls will be replaced by an arch bridge.

ROOFING AND CORNICE.

The Roofing and Cornice Trade.

IN A ROUGH WAY it is true that the condition of any one of the larger industries of the country is a measure of the general prosperity. We seldom find in any business analysis that there is profitable activity in one line of trade while the reverse conditions exist in other lines. So, therefore, as might have been expected, the record for the roofing and cornice business is not a lively one, nor has the trade brought wealth to its members during the past 12 months.

Too Much Legislation.

The gist of the reports that we have received from all over the country is that profits have been small, if any, competition has been sharper and the volume of trade diminished. It is noteworthy that many correspondents have complained of the work of our national legislators. We do not refer merely to the tariff policy that is associated with one of the political parties, for in that matter the correspondents write one way or the other according as they happen to be Republicans or Democrats. But what is impressive is that so many of them, as is the case in every other line of trade likewise, complain of the uncertainty which overhangs all business so long as there is danger at any moment of tariff enactments changing the situation.

One correspondent living in the South writes: "The only thing that we need is about three years' freedom from sittings of Congress. If they will only leave the tariff and the finances alone we will come out ahead." Another correspondent in Chicago says: "If the Congress of the United States would make some settled agreement on the tariff business and let it remain for ten years, I believe the people, as a whole, would be much better off."

Machinery.

There is a marked tendency in all trades to subdivide labor and utilize machinery, and the building trades are no exception. This change is a subject of note in the roofing and cornice business, for, as one of our correspondents points out, "there is a growing tendency to buy everything in the shape of piping, gutters, repair tin and other goods ready for use instead of putting the material together." The number of concerns dealing in cornices and roof finishing materials, that is, finials, crestings and the like, is constantly increasing, and the country tinner is now in a position to buy ready made all the material necessary for a very handsome piece of work. The increasing interest that is being taken in sheet metal for interior finish is notable, the demand for ceiling and side wall plates having increased not a little.

Competition.

In looking over the communications that we have received from members of the trade, there is a startling unanimity in the answers that have been given to our questions concerning the competition and profits. Not a single correspondent has said that competition was less, and very few admit that it was not worse than last year, all the rest saying it has become keener. One correspondent expresses it "as meaner, fiercer and more reckless than ever before." A Minnesota correspondent complains that "a large number of men who formerly worked by the day, not being able to get work, have bid for contracts, basing their profits on a day's work for themselves and trusting to luck to get the materials, and paying for the materials and for their men's wages when they get the money. This is hard on those who have capital invested in a plant and is a source of a great deal of annoyance."

Another correspondent, writing from one of the Eastern States, alludes to the poor work that is resulting from such keen competition. He says: "The greatest trouble with our business in this city is the deplorable tendency to slight work, and the motto seems to be, anything is good enough so it will pass. Very few take any pride in doing good work, and the architects help this state of affairs along by accepting work that should never pass. The consequence is that they can afford to do it cheaper than others and get the most of the work. This is very discouraging to any one trying to do good work and trying to keep up a well earned reputation for good work."

Profits.

Profits have been almost invariably less. The figures given show a reduction from 10 to as high as 75 per cent., though, leaving out the extremes, a fair average of profits would be about 20 per cent less than last year. Eastern manufacturers are being pushed by Western concerns, one of the well-known firms in this part of the country saying that the Western competition reduced their sales 40 per cent. below what they were two years ago. Another conservative business house having to do with sheet metal machinery say that their gross profits, compared with previous years, have not been reduced, but that the expenses for selling have so increased, in consequence of keen competition, that the net profits are considerably smaller than they have been.

Volume of Trade.

Respecting the volume of trade there is considerable diversity of report, though the general average shows a reduction compared with previous years. During the early part of 1894 the falling off was considerable, but later in the year business picked up, but not in all cases sufficiently to cover the reductions of the early part of the year. This point is dwelt upon by some of our correspondents, who draw a line around the first of July. In another case, the first eight months of the year are reported as bad. The reduction in volume from those who have furnished actual figures would average up in the neighborhood of 30 per cent. Local causes have affected the trade in some respects, as, for instance, one correspondent, who is adjacent to the cotton district, says that the large crop of that staple created a big demand for their sheet metal roofing and siding for erecting cotton warehouses and compressors.

Encouraging Features.

In spite of the unsatisfactory showing in the volume of business and the low profits there are encouraging features to note in the record of the year. The struggle has made all people conservative, and there is a general feeling that the condition of the purchasing classes is better than it had been. One would have thought, in view of the lessened business and unprofitable times, that the buying public would be less able to purchase and credits generally would have been unstable. The fact that this is not so, however, is particularly gratifying. Many report the situation in this respect unchanged, while a large number say it is improved. It must be borne in mind that, in part, this more satisfactory report is owing to the greater care that has been taken in extending credit. Accounts have been scrutinized in a way that they have never been before, and after the panic of 1893 the financial standing of customers has been looked into more narrowly. Another thing is that the buying classes have seen the necessity of economy, and are paying for neces-

saries instead of getting credit for luxuries. A correspondent in the East who does business all over the country gave as the record of his experience that a more increased strength was noted in the East and South than in the West, but this is hardly in agreement with reports we have received from the South itself, one prominent firm writing: "The low price of cotton has greatly weakened the finances of the dealers in the cotton belts; also sugar planters have suffered some." The same correspondent speaks of the congested state of the markets, and believes that relief can only come by increasing the demand either at home or abroad, or else making less goods and turning the flow of population from the cities to the agricultural sections.

A Pennsylvania firm, speaking of their sales, state that they have been smaller, but payments have been more prompt, the demand coming not so much from the large trade as from the smaller dealers. A correspondent in Houston, Texas, speaks of the competition that they are meeting from tin shops who, with neither character nor credit, are doing cornice work at prices that are absurdly low. Speaking of the general trade in Texas, they say it is in a little better condition than usual. "The whole community seems to have adopted a hand-to-mouth policy during the past year, and as a result the country merchant has not overloaded his store with goods nor his books with doubtful credits, and there is encouragement in the conservative policy that the people in general are pursuing. We feel that the foundation for a solid prosperity is being laid during these hard times in the lesson of economy and self reliance that the people are learning."

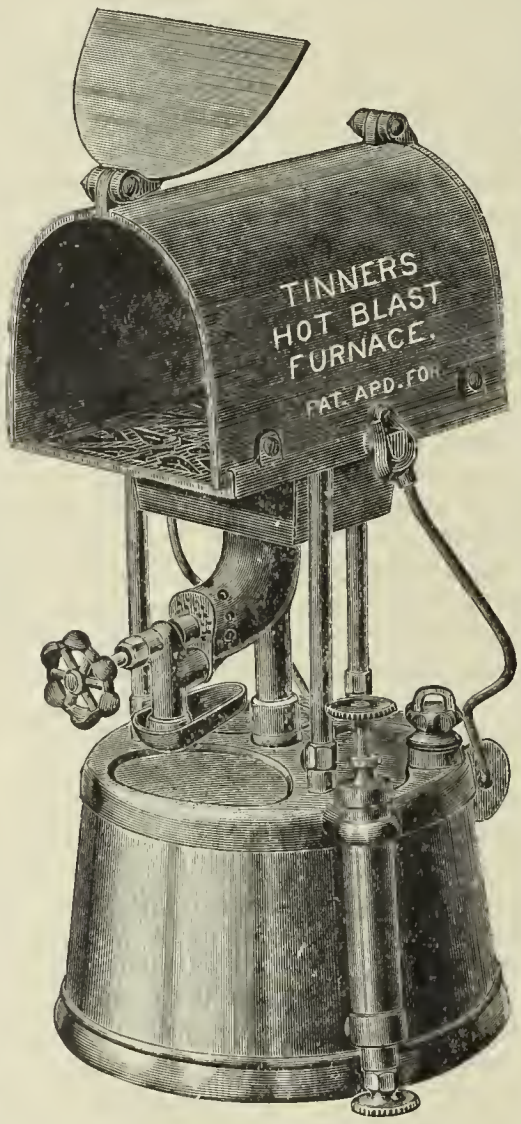
The Outlook.

So far as the past is concerned it is a matter of record and the business man knows from his books whether his trade has increased or decreased and at what profit it has been done. Dealing with the future, however, is quite different. The prophecies are largely a matter of temperament, or they are affected by the profits of the year that has passed. If things have gone well with a firm they are hopeful of the future, but it is hard to prophecy smooth things with a losing trade to look back upon. The roofing and cornice trade is, in a sense, a secondary industry, since it depends upon the building trade for its prosperity. There appears to be a good deal of talk about new buildings, but some of our correspondents complain that the contracts are not being let, so that there is no certainty that actual activity will result. One of the conservative Western houses, well known in the trade, say: "Our opinion is that there is no prospect of activity until the great questions which are being tossed about by our *intelligent* Congress are settled and they go home to their farms."

A Canadian correspondent refers to the way his business is being injured by the use of cedar shingles, and adds that the people generally prefer wood to metal for roofing "on account of its first cost being less, and also because their great-grandfathers used wood." The American manufacturers may congratulate themselves that, with all the obstacles in the way of their prosperity, they do not encounter a similar prejudice against new goods merely because of their novelty.

New Roofers' and Tinners' Furnace.

The White Mfg. Company, 40 and 42 State street, Chicago, have just brought out the new design of roofers' and tinners' furnace which is herewith



New Roofers' and Tinners' Furnace.

illustrated. It will be observed that the hood on this furnace is made of cast iron, with a swinging door at each end. These doors are hung at the top so that their own weight swings them shut, while the hinges have long arms to enable the doors to be opened back on the top of the hood when so desired. The hood is of large size to accommodate soldering irons of any description. It is claimed that by the construction employed every particle of heat is saved for the irons, none wasted. The utmost care has been taken to make this a perfect furnace, for use in the strongest wind. The burner has a generator of double strength, which, it is said, will not clog up. It will run for three hours without pumping and the heat can be regulated to any required degree. The burner has a patent renewable needle valve seat, which can be replaced at very slight cost when worn out. The reservoir is spun out of one piece of heavy sheet brass, covered with a cast top, constructed so as to neither sweat nor leak, tested to 50 pounds pressure, capacity for 1 gallon of gasoline and able to run the furnaces for 10 to 12 hours without refilling.

FLASHINGS.

J. J. Colvin, 159 La Salle street, Chicago, is to furnish the galvanized iron work for the residence of Joseph F. Ward, Evanston, Ill.; also the galvanized iron, tin and copper work for the residence of E T. Malone, Oak Park, Ill.

All the slate quarries in the Bangor (Pa) district shut down on January 1, owing to the cold weather. They will continue inactive until spring.

M. Cullen, Hartford, Conn., writes that he has been very busy during the last of the year with contracts for sheet metal work in cornices, skylights, inside metal work and some copper work.

John Seton, 78 and 80 Washington avenue, Brooklyn, N. Y., has installed in his shop a new press for cornice and skylight work, weighing 20,000 pounds, manufactured by Geo. A. Ohl & Co., Newark, N. J., which he refers to as the most perfect machine so far made for this line of work.

The Garry Iron & Steel Roofing Company, Cleveland, Ohio, in anticipation of a better business, are enlarging their works, and are going into the manufacture of iron trusses, &c., and a general line of architectural work in iron and steel. They also expect to push the cornice, eave trough and conductor trade more extensively the coming season. Their fire proof shutter has, we understand, been adopted by the Board of Underwriters and is meeting with a large demand.

Wagner Bros., 1350 Diversey street, Chicago, have finished a fine job of copper and galvaniz d iron work on the Masonic Temple, Ravenswood, Ill., including a large emblem in copper which ornaments the front of the building.

Sheet Metals.

Reports with which we have been favored from manufacturers of sheet metals operating in widely separated portions of the United States indicate that the year just closed was one of trial to those industries. This is especially true of the sheet iron trade. Partaking of the general depression which affected all trades to a greater or lesser extent, the sheet iron business, for the greater part of the year, suffered severely from the extreme dullness of the building and other trades, which constitute their principal clientage. Fierce competition for such orders as were available resulted in a shearing down of prices to an extent out of all proportion to the decline in raw materials. Many mills were forced to close down

and remained idle for the greater part of the year. Others were forced into the hands of receivers. Efforts were made from time to time to strengthen prices for black and galvanized sheets, but without avail, and the year closed with prices down to the lowest level known.

During the last quarter of the year, however, the demand for sheet iron showed a gratifying expansion. Stocks were reduced to a very narrow margin, owing to the large reduction in output, caused by the closing down of a majority of the mills. The reviving demand encouraged idle plants to resume operations, and in the last months of the year the trade experienced quite a little boom, so far as the volume of business went. Prices, nevertheless, continued weak and the margin of profits to the makers far from satisfactory.

The Eastern Manufacturers.

Eastern manufacturers of sheet iron place the shrinkage in volume of their business at from 25 to 50 per cent. Probably about 30 per cent. represents the average loss throughout the mills. Competition is generally referred to by them as being keener than ever, and the margin of profit much less than in previous years. As a rule, the manufacturers have found collections satisfactory, although some of their weaker customers have failed them.

A firm in the Schuylkill Valley of Pennsylvania, manufacturing sheet iron and steel, refer to this subject as follows:

"Those customers that have always been good are now better, there being a disposition with such houses to discount all bills. Those that have heretofore been doubtful or slow are slower than ever now. Failures, however, have been less frequent than in 1893, and smaller in amount. This is the only encouraging feature for the present year as compared with last."

This concern, unlike most, see no particular encouragement in the outlook for 1895, and regard the new tariff as extremely damaging to their business.

Another large Pennsylvania concern, who report a falling off in the volume of their business of 25 per cent., regard the outlook as fair for the early part of the year, to be followed by improvements both in demand and prices.

Yet another firm in the same State mention a loss of as much as 50 per cent. in the volume of business done, with shrinking profits. They do not look for much improvement this year. The general tendency of manufacturers in that section is, however, to the view that the business of 1895 will be fair in volume, but at very close margins.

The Middle States.

From a rolling mill in Ohio, producing black and galvanized sheet iron and steel, we get the following comparatively favorable report:

"Our tonnage will be 10 per cent. greater in 1894 than it was in 1893. Competition, however, especially during the last three months, was much stronger, and our margin of profit will be at least 25 per cent. less than in 1893. We cannot trace any bad effects to the actual Tariff bill itself, as it gives our branch of common sheets and galvanized iron ample protection. But we feel that we are sufferers, in common with every one, from its general bad effect on the community at large. We believe that we can see an improvement ahead for 1895, which, while it may not advance profits to any great extent, will at least start prices upward. Our losses this year will come entirely from the smaller trade. All of our large buyers during the entire year have almost invariably discounted their bills, a marked improvement in that regard over other years."

Another rolling mill firm, located in Ohio, state that their output of sheet iron was only about one-half that of a normal year and less than one-third in dollars and cents. They anticipate a gradual improvement, however, in the present year. They offer the following pithy remarks apropos of the keen competition in the sheet iron trade:

"Speaking for the iron business—what it needs most is for the mills to get closer to the consumer, doing away with the army of brokers—don't mean the legitimate dealer who buys and pays for material, but the irresponsible genius whose stock in trade consists of a pink-eared stenographer and a roll top desk who preys on consumer and manufacturer alike."

A third concern, located in Michigan, write as follows:

"The business done by us will be, on the whole, about as it was last year. The first six months was light, but the last six months, being better than the last six months of last year, made up to some extent for the small trade of January to July this year. We have made a greater amount of goods, but the price, being lower, has left the volume of business in dollars about the same."

Southern Mills.

The mills in the Southern States seem, on the whole, to have fared far better than their Eastern and Western competitors.

A sheet iron concern in Wheeling, W. Va., report the volume of their business as having been somewhat larger than that of 1893, but not so good as in some former years. They look for an extra good business this year, on the principle that after a depression comes a great revival, and they think the late depression will prove no exception to the rule.

From a second mill in the same district we are advised of a fair average business done in 1894, under very satisfactory conditions as regards payments, customers having generally taken advantage of the system of cash discounts.

A Southern concern, manufacturing sheet iron and steel from No. 28 to No. 18 gauge, speak of having done a larger business last year than in 1893, the increase amounting to above 20 per cent. They add, however, that the margin of profit was so close that only by running full, with closest economy, could they make any profit at all. Payments with them were better than heretofore, on account of the system of cash discounts.

The Chicago Sheet Iron Trade.

Chicago is a very large market for light sheets, both black and galvanized. Roofing and cornice makers are heavy consumers, trunk makers are by no means an insignificant factor, the stamping works are of large capacity, and miscellaneous manufacturers of small sheet wares are very numerous. The field has long been an inviting one for the manufacture of sheets, and in 1892 and 1893 two mills were built in the vicinity of the city, but for some reason they dropped out of the contest and neither of them turned a wheel in 1894, abandoning the trade to the mills in Indiana and further east. It was very certainly not a year for large profits in the manufacture of sheets. Prices fell over $8 per ton from January to April, although the January price was much below the average of the preceding 12 months. Contracts for No. 27 common iron sheets were placed about the 1st of April at 2.20 cents, Chicago, for large lots, to be shipped from mill, and rumors were current of even lower rates having been made. But from that time a marked recovery set in, and the demand was sufficiently large to keep the mills well employed until the close of the year. An increasing preference was manifested for steel sheets by consumers generally, while in the stove pipe trade smoothly finished iron was in greater favor, owing to its considerably lower cost as compared with past years. Galvanized sheets showed the effect of the increased capacity of old works and the entrance upon the field of new ones. Occasionally during the year an effort was made to strengthen prices, but for the most part competition for business was exceedingly keen and prices were weak. The adoption of a new list on galvanized sheets early in the year was of little avail in checking the slaughter of profits. The consumption was increased locally by the rescinding of a city ordinance forbidding the construction of metal covered wooden bay windows and light shafts, but the effect on the trade was not so great as it would have been in a year of great activity in building.

The Pacific Coast.

From California a manufacturer of steel and iron sheets writes that the competition with foreign plates, No. 18 gauge and thicker, is very keen in San Francisco. The new tariff, he believes, will injure his trade in the sizes thicker than No. 18; the gain in lower rates on wrought iron, scrap or steel billets does not help him any, as domestic steel billets and scrap are cheaper. He concludes, in regard to the outlook as follows:

"The outlook for the coming year is better than for the past year. The timely rains this fall which have been general on this Coast have stimulated the hopes of everybody. A great

many irrigating schemes are likely to be consumated and this requires a large amount of light plates, Nos. 10 to 16."

Sheet Brass and Copper.

Brass and copper rolling mills have done only a fair business. Competition is referred to as being quite as sharp as in the previous year, while profits have been about the same. Manufacturers in this branch of business have had the advantage over their sheet iron contemporaries of being able to keep their works running at a fair working profit, and in some instances at a slightly better profit than formerly. The dullness in building operations during the year caused a considerable restriction in the demand for cornice copper. Some of our correspondents place the falling off in sales in this department as high as 50 per cent.

A brass rolling mill proprietor in Illinois writes that his business for the first six months of the year was much below 1893, but the latter six months brought a considerable improvement. He looks for an increase in the volume of business this year, and refers to collections as having been very satisfactory; money, he remarks, seems freer and payments come in with less urging. A similar condition is reported from New England. A correspondent in this industry, located in San Francisco, speaks of the year's trade in the Pacific Coast as having been very poor in the earlier portion, but better in the fall and since. Profits, he thinks, were slightly better, and he regards the outlook as promising a better business in that section.

Miscellaneous.

A great many trades with which the readers of *The Metal Worker* are more or less directly concerned have furnished us items that will be of assistance in summarizing the general industrial situation. From these advices we make some selections:

Hardware.

The reports from our correspondents in the hardware business are not uniform respecting the comparison of trade this year with a year ago. The majority, however, refer to a falling off in amount, the figures giving the average of about 10 per cent. Some few others have held trade even, while a lesser number report an increase. The latter, however, account for it in several cases by additional lines added to their business and by the fact that they deal in specialties which are not so much affected by hard times. The prospects for the coming year are not altogether unpropitious, according to the best opinions of our correspondents. There are, to be sure, reports prophesying evil things, but, taken as a whole, the tendency shows a belief in a brighter year. One Western firm say: "Altogether we believe that the entire country is in better shape than for two years past." Another writes in this conservative way: "We see no prospects of better results prior to July, 1895; at least values are still falling and the building trades are not looking up." This expresses the condition of things in one of the cities of Western New York. As an offset to this, however, we have the following report from another well known firm in one of the larger cities of that section:

"The prospects appear to be better; factories and shops in the city are more fully employed than was the case this time last year. There is considerable building in progress and more that is now certain to be commenced at an early date."

In Ohio the reports are generally favorable, one firm looking for a gradual improvement, beginning with the opening of spring trade, and another being of the opinion that they will do an average trade in 1895. One New York firm have a reason for not being over hopeful of the future, for they say that "the country at large cannot grow rich on 50-cent wheat and 5 cent cotton," and the same thing is alluded to in a report from a Texas dealer, who writes:

"The abundant cotton crop that has just been marketed here sold so much lower than usual that it seems to have taught the farmers a great lesson in economy, and they have in consequence taken more money home with them than usual."

The following opinion is from a manufacturer who comes in contact with the hardware and similar trades. He writes: "Our salesmen cover the greater part of the United States and they report that the outlook for the coming year is very favorable."

Refrigerators.

The reports that we have received from this important industry indicate that the volume of trade, as a rule, was less than during 1893, the reduction averaging some 25 per cent. One of the few concerns reporting an increase in business say that early orders were small, but having built freely they had the goods ready for prompt shipment, and as a result did a larger business than usual. They remark that the demand was principally for the medium and large sizes of refrigerators. The prospects for the coming year are considered brighter than they were 12 months ago. The Western manufacturers think it will be better throughout the East and West, but in the Northwest they are looking for no great amount of trade. In a general way they consider that the demand will be fair in quantity, but they are afraid that the competition will keep prices very near to the unprofitable point. The Eastern makers are anticipating better trade, and one manufacturer writes:

"Dealers are just as reluctant as at this time last year to place orders, and those that can be induced to do so make them small. A few have carried over stocks; but, inasmuch as they had bought sparingly, these stocks will soon be disposed of when trade opens and we believe orders will then be placed as freely as usual."

The same concern write favorably of the financial strength of the purchasing classes, saying that they have been able to make collections more promptly than usual. They add:

"If manufacturers and others insist on terms being more respected than in the past, it will tend to a more healthy state of affairs in this connection. The desirability of purchasers respecting terms, and manufacturers and jobbing houses insisting on their doing so, ought to be generally recognized."

One well known firm of manufacturers complain of the practice of dry goods and department stores handling refrigerators and selling them at little or no profit, using them as leaders and relying on their other sales for making money.

"Such stores," they write, "may be big institutions in their way, but they have more disastrous effects on trade generally and on the already insignificant wages of the American mechanic and laborer than any tariff that has yet been devised or tinkered with. We believe that any thoughtful man who spends his entire time in such a business as ours and visits the trade all over the country, as the writer does, will agree with him as to the injury that has been done to manufacturing industries and legitimate dealers by the class of stores referred to."

An important conference, called by the Welsh Tin Plate Workers' Union, was held at Cardiff on Saturday week to consider the situation in the tin plate trade. After long deliberation, the Executive Committee's report was approved, and submitted to the different branches for final decision. The report was as follows: "1. That the council should declare itself in favor of a uniform rate of wage. 2. That inasmuch as a reduction of wages of 10 per cent. below the standard of 1874 has been accepted, and is now in operation, and that further and heavier demands are made, the council, under present circumstances, strongly urge upon every body of tin platers, on no account to agree to a greater reduction than 10 per cent.; and further, to take care that no contract be agreed to extending further than the end of March, 1895. 3. That the seven districts be requested to elect one member each to act in conjunction with the 12 executive members, and that the tin plate masters be invited to appoint an equal number to form a board to deal with wages and other matters pertaining to the tin plate trade." Some of the tin plate workers in the Llanelly district have, however, expressed themselves in favor of a reduction of 15 per cent. They fear that unless the men compromise the matter and meet the manufacturers half way, most of the works will close indefinitely.

The familiar calendar of Bruce & Cook of Water street, New York, is the eighty-third annual announcement of that well known metal house. The calender is in the customary style of decoration, and consists of a large card with the months divided into small panels and arranged each side of a picture of the warehouse of the company. Of particular interest at a time when so much is being said of the weights of tin plates is the table printed on the back giving the weight per box of tin plates of all sizes and gauges.

PLUMBING and GAS FITTING.

Review of the Plumbing Trade.

THE CLOSING MONTHS of 1894 brought encouragement to all engaged in any branch of the plumbing trade. Our correspondents in every part of the country, however, seem to agree that the volume of business was less than in 1893, when what has been termed "the panic" began. The reduction in the total amount of business done is variously estimated in some cases at as much as 40 per cent., and a general average based on these reports might safely be said to be at least 10 per cent.

One writer says: "The beginning of the year was slow, the present is better and on the increase." Another says: "Our business was materially less than in 1893, though the latter half of the year will, perhaps, show a small gain over the same period of 1893." Still another writes: "Our business is as good as it ever has been, but in ordinary times it would have doubled up."

Competition.

All have felt a sharper competition, which is reported by some to be "simply slashing." One says: "Competition is worse than ever before known, and in some lines cost of goods does not seem to be considered in making sales;" while another writes: "Profits are sacrificed to keep up volume of business; prices are too low in all lines of manufactured articles." A plumber reports: "Competition is sharper than ever. Many journeymen, through lack of work, have been compelled to take contracts for buildings at prices very satisfactory to the owners, the owners becoming responsible for the materials. The result is that work has been done at a lower price than is possible if association wages are paid, and a small advance is charged on the materials for a profit." A Western plumber says: "Competition is even sharper than last year. The firm that gets no work except in general competition is short of a profit, if not worse." A few report a good business, but, unfortunately, they are in the minority.

The Profits.

As a natural result, in such a depression as has been experienced throughout the country, and with the competition of the character reported, very few show any increase in profits. The majority report a reduction to the extent that only through a much larger output and a saving in the cost of production are they able to make the year's profits foot up to the amount of former years. The reduction may be estimated, from our correspondents' statements, at as much as 10 per cent. Some say "profits are less, owing to the cutting of prices without regard to cost;" others say "less margin of profit, prices badly cut," while still others say that "while the cost of material is less, the price of goods has been reduced out of all proportion with it, so that the margin of profit is much less and in some cases gone entirely." "Profits," according to an Ohio manufacturer, "are much less than former years or last year, but he hopes to make it up by larger sales." Another manufacturer writes: "Profits are better, due to smaller orders, and more of them;" while from another source we learn: "Prices are as low as they can go, and any change must be for the better and more profit."

The New Year's Prospects.

There is a disposition on the part of many who have money that is not earning much interest to go into real estate. This is marked by the busy condition of architects' offices and of the inquiries about land and material by contractors. The benefit to be derived from this movement will come first to the plumber and then to the manufacturer of plumbing goods. That better things are expected is shown by the opinions expressed. One writer says: "For the coming year prospects seem to be brighter;" another: "Prospects are very fair, and already we feel a little improvement in business." A plumber writes: "Things look brighter;" another says: "The prospects for the coming year are good and we are very hopeful. We do not like to say too much about it, but will be disappointed if we do not increase our present footings one-half." One manufacturer says: "From our inquiries we are preparing for a big year at good prices." Another says: "Things look better, money is being taken from stocks and speculation and put into real estate." Another writes: "With us prospects are A 1," and another: "A gradual improvement is expected by us, but no business of any magnitude for at least eighteen months." The prevailing impression of the situation is that the prospects are good unless some financial legislation checks the restoration of confidence that is now gaining ground.

Hard Times.

Having reached the bottom, as many of our correspondents put it, there is no reason why "better times" should not be talked to help things along. Several have asserted that many have used the "hard times and tight money" cry who were in no way affected by them, and thus made the times harder and collections more difficult. Some houses state that the conditions for trade are better, as there has been a weeding out of men who were incompetent to manage their business in a systematic way. A general impression exists that those who are likely to buy are able to pay. There is not so much trouble reported in making collections as might be supposed. Some state that their collections have been good and that there is an increase in hand to mouth buying, with a strong effort being made to secure the benefit of cash discounts.

The Use of Better Goods.

Never before could so much be secured for the money, which has materially aided in the introduction of strictly first-class goods, where formerly buyers could not be induced to consider them on account of cost. This has also brought domestic sanitary work into a prominence that has been alike advantageous to the owner and to the tradesman. With the increased use of exposed fixtures for all purposes there has been a decrease in the use of lead and solder work. This is a source of lamentation to some of the old-school plumbers, who, though they take pride, do not find consolation in the fact that their sanitary knowledge is still looked upon as invaluable in the construction of a system of modern plumbing.

New Articles and Methods.

The year has seen the introduction of many new goods in the various branches of the trade, and improvement has made some of the standard goods of the past seem very crude in comparison with those that have taken their place. New processes and methods of manufacturing for the reduction of cost have been general. One house says: "We have made no improvements of magnitude, but have many new devices and improved designs of standard goods." Another reports: "We have made changes in our goods by cutting off needless expense in cost in material and methods of doing the work." From another: "We have made a number of improvements in our tools, so that our output of goods is increased with no more labor than formerly." Some report new things that are being held back until the market is in a better condition for buying.

Associations of Master Plumbers.

The National Association of Master Plumbers has added to its membership and accomplished some things this year for which it has persistently labored in the past. Other matters are before its Executive Committee which will be treated in a businesslike manner for the good of all who come in contact with the association. Through the intimate acquaintance of its members, effected by their national and local meetings, the trade have less trouble from cutthroat competition and have raised plumbing, as a business and a science, to the high plane to which it belongs from the important influence it has on the public health. The association has much work before it to reach the mark set by some of its members, as is shown by the following: "I would like to see a National Board established to thoroughly investigate all systems of plumbing, with a view to establishing a standard that all plumbers could follow and feel that they were safe. This would avoid the competition with the 'go as you please' systems, each one the best in the mind of the originator. I would advocate a system of inspection that would give the property owner a correct idea of the condition of the plumbing in his premises, so that existing evils could be corrected. The next move would be to have examiners to pass on the qualifications of plumbers, and determine as to their competency to practice the trade. Then, by careful inspection, the incompetent or dishonest would be kept where they should be."

Learning the Trade.

The value of the trade school is being more widely recognized, and in several cities the master plumbers' associations shorten the term of apprenticeship one year to those who possess a trade school certificate. As the result of the benefits following a course in plumbing at the New York Trade School, plumbing classes have been formed in a number of cities of smaller magnitude. There are now several such classes in connection with other educational institutions in New York City, besides those in Philadelphia and Brooklyn.

Manufacturers' Associations.

During the latter part of the year the manufacturers of plumbers' supplies in different sections of the country have formed associations which is a new subject for consideration. These different associations work in harmony with each other and meet more frequently than would be possible with one national association, yet having all the advantages of a national body. There is said to be nothing in the course of action proposed that will be antagonistic to the interests of their customers, the plumbers.

Sanitary Earthen Ware.

The increased use of sanitary earthen ware is generally noticeable, and one correspondent says: "Where there was but 10 sanitary potteries in 1890, there are now 18 fully equipped, which has caused the selling price to come down with a jump that has affected the workmen. There is, however, no difficulty in procuring a full complement of hands to operate all of the potteries, but the demand is not for more than half of what can be produced." Vitreous earthenware is the latest pottery production to attract special attention. It is said to be perfectly non-absorbent and unaffected by changes of temperature. It is a general impression that the siphon closet is fast becoming the closet of the day for first-class work, as a better scouring and a deeper seal are secured.

Canadian Trade.

One correspondent from Canada says: "Prospects are very bright for next year and we are preparing for a larger volume of trade. The building trade expect to be busy and many large buildings are well under way." Another writer says: "As far as we can see we think we shall have a good season's trade." In commenting on the financial condition of trade the following remarks are made: "Although the complaint is general that collections are slow, we are able to collect pretty promptly in the majority of cases. There is a 'weeding out' process going on which will certainly force numbers 'to the wall,' but those left will be on a surer footing and will give a better basis to business than it has had for some time past."

The Chicago Master Plumbers.

The Chicago Master Plumbers held a meeting at their rooms, 107 Madison street, Thursday afternoon, December 27, at which there was a full attendance. The president and several committees made their reports, which were well received by those present. The election of officers for the ensuing year was the next in order, with the following result:

President, P. M. Murphy.
Vice-president, M. L Mandable.
Secretary, J. B. Breen.
Treasurer, P. Sanders.
Sergeant-at-arms, L. A. Larson.
Executive Committee: Paul Redieske, C. J. Herbert, M. J. Corboy, J. S. Webber.

The annual reception and ball will be held at the Auditorium Banquet Hall, Wednesday evening, January 30, 1895.

BROWN & WALES, Boston, Mass., advise us that they have made arrangements with Randolph & Clowes, Waterbury, Conn., manufacturers of the Brown & Bros. Copper House Boilers, by which they are enabled to carry a stock of these well-known goods, so that all orders can be filled promptly from their Boston store. They feel confident that this will be a great convenience to dealers in plumbers' supplies as well as plumbers themselves. They state that a difficulty has been that although these Boilers were frequently specified in contracts the plumbers were apt to provide some other make, owing to the fact that the Boilers could not be delivered as promptly as desired.

President Redieske's Address.

We print below the report of President Paul Redieske, of the Chicago Master Plumbers' Association, presented at the annual meeting of the association held December 27:

In presenting my annual report for the past year I will try in a brief manner to review the work of the past administration. When your officers assumed control of the affairs of the association for the year 1894, the plumbing trade of Chicago had just passed through a prosperous period. The great World's Columbian Exposition with its many magnificent productions had come to a close, but the dark cloud of distress (foreshadowed in our worthy ex-president, T. P. Culloton's, report of last year) which followed in its wake, has hung over this our great city for the past year, causing great destitution and financial loss, which a great many of our craftsmen and members were not fortuate enough to escape, but I think that I can safely say that the outlook for the future is again brighening, confidence seems to be gradually returning in all branches of business, and we may safely hope for a very prosperous spring.

After the election and at the first meeting of your Executive Committee of the past year, the first thing that was uppermost in the minds of the members of that committee was how to bring about a more hearty spirit of sociability and good fellowship among the members, and with that end in view the committee started to arrange an entertainment and ball, the success and pleasure of which no doubt are still fresh in your minds; and by your instructions to the committee a few meetings past to arrange for another you seem to be longing for a repetition of the same.

The next question for the consideration of the Executive Committee was the arrangement of a new agreement with the journeymen, and great credit is due to the Arbitration Committee who had the question in charge, for I do not think that there ever was a committee appointed by the association since its foundation that have worked harder and more faithfully for the interests of the association than they did. For three long weeks they sat from early morning until late at night to try and come to some settlement, and, in my mind, they arrived at the best settlement under the conditions then existing.

Next came the convention, and no doubt you have all read the report and noticed thereby that the delegates that you sent to Detroit represented this association in a creditable manner. Through the hard work of the National State Vice-President, Wm. Geary, with the assistance of your last Executive Committee, the Illinois Master Plumbers' Association is now an established fact and in a very flourishing condition, the first convention being held in Peoria last June.

One of the great things which this association is trying to accomplish is the passage of a bill governing the licensing of plumbers in this State, by the incoming Legislature, and every member of this, our local association, ought to see to it that the members of the lower house, as well as the State Senators of his district, will vote for the passage of this bill.

The next question that came up was the question that has been before the association since its foundation—namely, the apprenticeship question, and great credit is due the committee that have worked so faithfully for the past three months for a final settlement of this great question, and I hope that if it is not already settled by this meeting that a final settlement will be arrived at in the near future.

Our relations with the manufacturers and dealers in the past year have been of a very harmonious nature, with the exception of one, who is now out of the good graces of the association. All differences that have been referred to the Executive Committee have received prompt attention and a speedy settlement arrived at. The question of sub contracting is now receiving attention and has been placed in the hands of an able committee, whose report you will have heard to-day.

There is another very important matter to which I wish to call the attention of this association. You have no doubt all read the interpretation of the Baltimore Resolutions by the National Executive Committee. This, no doubt, will be the leading question at the next National Convention, and upon the right disposition of the same no doubt depends the future welfare of the

national as well as all local associations of master plumbers all over these United States. Yes, I do not think that it is assuming too much when I say that the very life of the national and the local associations, as well as every master plumber's individual business all over the United States, depends upon the right disposition of these questions of trade protection.

There are a great many other questions that I might enter into, which would prolong my report and make it cumbersome, but I think it is the duty of every member of the association to be present at all the meetings, so as to know as well as the officers of the association what is going on, and to watch over the interests of the association.

In conclusion, I wish to thank all the members of this association for all the kindness and forbearance shown me during the past year. Especially do I wish to thank the members of the Executive, Arbitration and Apprenticeship committees, as well as all other committees, for their promptness in attending the many meetings during the year, and for the assistance they have rendered me during the year.

TRAPS AND VENTS.

THE DIFFERENT master plumbers' associations throughout the country will soon be electing their officers for 1895. *The Metal Worker* will be glad to receive from the secretaries a list of the new officers for publication, as it is of interest for the plumbers of one city or State to know the officers of the associations away from home.

AT A MEETING of the Master Plumbers' Association of Cincinnati, Ohio, last week, the following ticket was placed in nomination: President, C. J. Nolan, J. J. Dowd, Richard Murphy, William Allison; vice-president, J. R. Gibson, Charles Atkinson; secretary, George Mellor, Jr., Frank Hopper; treasurer, J. D. Sullivan; sergeant-at-arms, T. D. Lynn.

AT A MEETING of the Plumbers' Supply Association of New England in Boston, December 21, the following were elected officers for the ensuing year: F. J. Knox of Hartford, president; Emory F. Souther, president of the Dalton & Ingersoll Company, Boston, vice-president; W. N. Goddard of King & Goddard, Boston, treasurer, and John B. Dupee, Boston, secretary.

THE ST. JOSEPH PUMP COMPANY, St. Joseph, Mo., report that during the year they have added a two-story 30x90 foot building to their plant and have put in two boilers and a 175 horsepower engine. They have also made some substantial improvements in their line of pumps.

THE AHRENS & OTT MFG. COMPANY, Louisville, Ky., will erect a new building, 180 x 60 feet, for enameling iron bathtubs.

THE ALBERENE STONE COMPANY, 217 Lake street, Chicago, are to supply ten combination laundry tubs and sinks for the building at 416–418 West Madison street.

"OLD PEPPER" CUSHING of the Knights of Tabasco has answered the letter which appeared in the trade press from the Executive Committee of the National Association of Master Plumbers, bearing the signature of President Mitchell. "Old Pepper" takes a dignified stand in his reply, and is positive in the statement that the "Knights" are a representative body of men and above the reflection which has been made upon them.

A CHARTER was issued November 14 to the American Porcelain Company, New Brighton, Pa., for the manufacture of earthenware sinks, wash trays, &c. The capital is $50,000, and the directors of the company are T. E. Marshall, Frank S. Reader, J. S. Boyd and Thomas Craven of New Brighton, and S. L. Marshall of Pittsburgh. The ware is of a light brown colored body, enameled with a heavy coat of perfectly white china, giving the same effect as white clay, with the advantage, it is claimed, of being harder burned and more lustrous. We understand that this ware has been subjected to many tests with excellent results. It has been proved to be proof against crazing, and the enamel cannot be separated from the body. The company have purchased the Scott Tile Company's works in New Brighton, which they have put in complete order and equipped with new machinery. The main building is 100 feet square, two stories high, with two large kiln houses, one 45 x 85 feet, and the other 40 x 60 feet. A large warehouse and office adjoin the railroad siding, giving excellent shipping facilities.

OWEN & SALTER, manufacturers of plumbers' supplies, Buttonwood and Twelfth streets, Philadelphia, are distributing a neat little vest pocket renewable memorandum book in fancy leather covers. The inside cover pages are utilized for describing their Maelstrom closet and Faultless basin waste.

THE PLUMBING SHOP of Walter Hager, Johnstown, Pa., was destroyed by fire on December 31.

THE BURGESS SOLDERING FURNACE COMPANY of Columbus, Ohio, inaugurated on the first of the year a new feature in the sale of their soldering furnaces. It is that all cylindrical cast iron burners of their Gem furnaces are guaranteed for one year against burning out, and during the period named the company will furnish one free of charge.

THE WADSWORTH PLUMBING COMPANY have been incorporated at Cleveland, Ohio, by Frank A. Wadsworth, W. A. Wadsworth, J. B. Wadsworth, G. H. Wadsworth and H. J. Link, for the purpose of doing a general plumbing, gas fitting, steam and hot water heating and sewer building business in Cleveland.

A PETITION has been sent to the City Council of Minneapolis, Minn., for the appointment of experienced plumbers as inspectors of plumbing.

COL. GEO. E. WARING, Newport, R.I., the well known sanitary engineer, has been appointed Street Cleaning Commissioner of New York City.

THE FLUSH TANK COMPANY, Richmond, Ind., are issuing a circular of their Siphon Eduction Closet Range for schools and public buildings. The circular gives a cut of the closet set up showing the flush tank, seats, the trap and drain pipe. By means of a siphon the range of closets are said to be effectually flushed periodically, after which there is 7 inches of clear water left as a separate seal under each seat. The closets are made in sections so that the number can be increased when desired. The company are also manufacturers of the Rhoades-Williams Automatic Siphon, the Field-Waring Automatic Siphons, and the Yeteve Raw Sewage Closet Systems.

THE ANNUAL ENTERTAINMENT AND RECEPTION of the Master Plumbers' Association of New York will be held in the Lexington Opera House, Fifty-eighth street and Third avenue, on February 12. The committee having charge of the affair and the tickets are John Yule, T. J. Tuomey, Charles Schloesser, T. J. Cummins and Milton Schnaier. Several specialists have been secured for the entertainment and the music will be furnished by a well-known orchestra.

SCRAP.

FORD & DONNELLY, Kokomo, Ind., are erecting a pickling machine of the Grey patent for the Atlanta Steel & Tin Plate Company, Atlanta, Ind., and also one of the same type for the Montpelier Tin Plate Company, Montpelier, Ind. These machines have a capacity of 45 tons per day.

ATLANTA STEEL & TIN PLATE COMPANY, Atlanta, Ind., expect to be rolling their own black plate by February 1 and not January 1, as stated last week.

A PRESS DISPATCH from McKeesport, Pa., states that the locked-out tin plate workers of the United States Iron and Tin Plate plant, at Demmler, Pa., have inaugurated a movement to erect a $40,000 tin plate plant. The McKeesport, Pa., Board of Trade has been invited to assist in securing a location for the plant. At a meeting of the Board of Trade a committee was selected to ascertain what inducements can be offered to the men to locate the works at McKeesport.

THE WORKMEN at the tin plate works of R. Thomas & Co., at Sydney, Gloucestershire, and Lydbrook, Herefordshire, England, have agreed to accept a reduction of 10 per cent. in their wages for three months. It is probable that the men at the Mellingriffith Works, near Cardiff, in which Messrs. Thomas are interested, will follow this example.

THE BALTIMORE IRON, STEEL & TIN PLATE COMPANY, Baltimore, Md., are reconstructing and enlarging their mill, at Locust Point, near that city.

GREAT WESTERN TIN PLATE COMPANY of Chicago will have their rolling mill and tin plate works at Joliet, Ill., in operation by January 21. The company will manufacture bright coke and terne plates, as well as black sheets.

THE ELWOOD TIN PLATE COMPANY of Elwood, Ind., have filed articles of incorporation with the Secretary of State of Indiana. Their capital stock is placed at $10,000, and the directors named are G. Samuel Allison, F. Marion Conner and Richard Howland, all of Richmond, Ind.

WE ARE ADVISED by a London cable dispatch of January 2 that a large meeting of tin plate workers was held at Llanelly last Saturday, at which it was decided to maintain the 36-box rule and refuse to accede to the proposed reduction of 10 per cent. in wages. Several Welsh tin plate works are reported as closing down indefinitely, including those of the Cynon Tin Plate Company at Aberdare, and the Upper Forest Works, at Morriston, South Wales.

PITTSBURGH TIN PLATE WORKS, New Kensington, Pa., are reported busy, having their full equipment of six tinning pots in operation. The concern are now rolling their own black plates. Their output consists of Kensington charcoal bright plates, Amber coke bright plates, and Kensington, Amber and Westmoreland ternes. The last named plate is controlled by Sidney Shepard & Co. of Buffalo and C. Sidney Shepard & Co. of Chicago.

STEAM AND HOT WATER.

Steam and Hot Water Heating Trade.

THE REVIEW of the trade which we present below was prepared for us by a prominent heating engineer, who has had every facility for studying the condition of business in this department.

General Review.

While many lines of business and manufacturing interests have suffered during the year 1894 through business depression, competition, and other causes, the heating of buildings—particularly private residences—by steam and hot water, or what has become known as the house heating industry, has advanced during the past year in appliances, methods of placing and amount of business done as compared with former years.

In addition to improvements in construction made in some of the older styles of heating boilers during the past year, a number of new constructions have been invented, patented and brought before the public, some by inventors and manufacturers who have already achieved fame and success in this line, and others by new aspirants in the field. Many of the newer constructions are but copies of older designs, from which some objectionable feature has been eliminated, or with some improvement added. In fact it would seem impossible in the present state of the art of boiler making in this country, with its hundreds of manufacturers making almost every conceivable shape and construction, to produce a house heating boiler that did not possess some of the features of the older constructions.

Types of Boilers.

Boilers are made of wrought iron, steel, cast iron, and a combination of wrought iron or steel and cast iron in one piece and in sectional form, portable and brick set, some with magazine feed and others surface burning, some with a direct draft only, others with a return flue only, and still others with both a direct draft and a return flue, with the many different circulations of water and gases and the different arrangements of surface. Plain and extended flat, rounding and corrugated drop tube. Fire box and flue surface arranged in different proportions, and when in sectional form with both the washer and screw joint, with and without manifold or drums, and with fire boxes round, square, oblong and oval, some formed of brick and others water lined, with bases or ash pits of iron or brick and with water lined bases.

Line of Development.

The type of boiler which has possibly been more fully developed during the past year, and which is being constructed in slightly differing designs by a number of manufacturers, is the vertical sectional cast iron boiler with screwed joints, a vertical circulation of water, a horizontal fire travel, a direct draft and a return flue, each section having its own proportion of grate area, fire and flue surface, and being arranged as a surface burning boiler. Many manufacturers advocate the use of a non-conducting covering on their boilers, some furnishing it as a part of their construction. This particular design has been very largely used during the past year, many of the newer constructions being of that type. Boilers with a direct draft and horizontal water ways have not been as largely sold as in the past. The older manufacturers have enjoyed a slightly increased trade, while those that have come into the field later seem to have taken up the natural increase of about 20 per cent. Prices have been firm, the only reductions being due to the reduction in cost of the raw materials entering into their manufacture.

Radiators.

Radiators have been improved in design and finish, and some new styles have been brought out. The older companies have extended and increased their trade, while a number of new companies have come into the field. Prices have been somewhat reduced, and the tendency has been to use plain rather than extended surface for direct radiation. With the growth of the steam and hot water systems mechanics in all sections of the country have become more familiar with the best methods for placing the systems; manufacturers have become more familiar with the actual capacity of their goods, and as a result we hear of fewer failures or partial failures.

Pipe, fittings, valves and other goods entering into the construction of steam and water heating apparatus have been slightly reduced in cost, making the cost of the apparatus from 10 to 20 per cent. less than in former years and thus helping to popularize the systems.

Steam and Hot Water.

As near as can be ascertained by inquiry among boiler and radiator manufacturers the percentage of steam apparatus placed during the past year has been about 60 per cent., while hot water apparatus has been about 40 per cent. of the total production. The present indications are that 1895 will show a marked improvement and a still further increase in the number of steam and water heating apparatus placed and we are also promised some new designs of boilers.

Opinions of the Trade.

Following after the review of the steam and hot water heating trades, it will not be without interest to quote from some of the reports that we have received from representative houses in different parts of the United States. It is pleasurable to note that the general feeling is that the future will not be without comfort to those who long for better business. A prominent manufacturer writes that he thinks the prospects for the coming year are very favorable, and adds the encouraging statement that the financial strength of the purchasing classes was, in his opinion, a great deal better in 1894 than in previous years. Another large firm in the East write:

"We think the prospects for the coming year are more hopeful, since there is evidence of more building and general business, and there are preparations for doing something."

The same firm, when asked for their opinion of the effect of the new tariff on their business, replied, "D—— the tariff." This may not be the most elegant way of expressing one's sentiments, but we have no doubt that it reflects the opinion of very many people who are longing for the time when the agitation of this agitating subject shall have ended.

A prominent steam fitting concern of New York City believe the prospects are very fair as to the volume of business, but think the future holds out little hope of any improvement in profits. A radiator manufacturer writes:

"The steam fitters, so far as we have come in contact with them, expect a good trade in 1885, owing to more and larger building enterprises; hence we look also for increased trade next year."

A conservative firm, writing from Philadelphia, say:

"We think the prospect promises a light business for a few months of the coming year, but hope for an improvement before the end of next year."

A prominent heating engineer, who has been connected with the business for many years, writes us rom one of the large Ohio cities:

"The prospects for the coming year I consider favorable, but think that next year will witness a greater reduction in profits in all classes of work, and also a reduction in wages paid to labor."

A well-known firm of New York contractors expressed the following opinion:

"Unless business improves and better prices are obtained it is our opinion that it is only a question of time when many parties now in business will be obliged to discontinue. Only strong firms can stand a continued pressure like that of the past year."

As a closing quotation we print an opinion from the president of a well-known firm of steam engineers and contractors whose reputation has extended far beyond the New England States. Our correspondent writes:

"For the last six months we have seemed to be going through a long tunnel on a level grade. This tunnel apparently has a curve in it so we can't see through, and consequently we don't know whether we shall come out into daylight in three months or three years."

National Fitters' Association.

Increased activity has been shown by the National Association of Master Steam and Hot Water Fitters of the United States since the annual convention in New York last June. At the convention a number of interesting papers were read by its members, and an English engineer, David M. Nesbit, a guest of the association, also presented a paper. The Executive Committee have held regular meetings, an important one having been held on September 30, when what is known as the "Trade Resolutions" were passed. The deliberations of the Executive Committee have been issued to the members in the form of a bulletin that they may know just what is being done in their interests.

New Associations.

During the year two new associations have been formed that are of interest to the heating trade. One is the Association of Boiler Manufacturers formed in New York and which recently held a meeting in Detroit. This organization has considered its affairs of no public interest and its business has been transacted in private.

The American Society of Heating and Ventilating Engineers is a newly formed association that already includes many prominent members of the trade and gives promise of a successful career. A preliminary organizing meeting was held during the fall and officers were elected to serve until the first regular convention, which will take place in New York on January 22.

Another association, or rather set of sectional associations, has been formed by the manufacturers and jobbers of supplies which has excited some comment, though it is claimed that its objects do not conflict with the interests of the trade.

HEATING NOTES.

THE SOUTHERN HEATING COMPANY, Louisville, Ky., whose incorporation was noticed in *The Metal Worker* of December 15, are representing the following concerns: J. H. McLain Company, Canton, Ohio; Buffalo Forge Company, Buffalo, N. Y.; Powers Regulator Company, Chicago, Ill., and the Dean Steam Pump Company, Holyoke, Mass. The Southern Heating Company, we understand, are desirous of receiving catalogues, price-lists and discounts of all goods in their line.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, engineers and contractors for steam and hot water heating apparatus, have been succeeded by the Charles H. Simmons Company. Charles H. Simmons is president and treasurer, C. M. Simmons is secretary, and W. H. Finney is general manager. The management of the company thus remains unchanged, still being under the care and supervision of Charles H. Simmons, who has practically had charge and control from the time of the company's inception ten years since. The company assure their patrons that their facilities for doing business are to be better than ever, keeping up the reputation of the concern for progressiveness. It is their aim to make each job of heating better than any that preceded it. The company have just issued a very neat pamphlet giving a list of architects and owners for whom they have furnished their improved heating apparatus.

WRAY, WENTZEL & ROBINSON, Bellwood, Pa., who recently purchased the plant of the Robinson Company, are issuing a four page circular of the Popular hot water fire place, printed in red and blue ink on fine paper. The first page shows a general view of the fire place and the second page gives a horizontal section, showing the grate bars, the water section and the air spaces. The third page shows a vertical section of the fire place set, with outside air supply, two hot air registers, expansion pipe and flow and return pipe to two radiators. The fourth page illustrates a cottage and plans with the fire place arranged for heating four rooms. Between the illustrations the text describes the apparatus.

WE HAVE RECEIVED from the A. A. Griffing Iron Company, Jersey City, N. J, a bound copy of their "M" catalogue. The book contains several new features showing the Bundy Semi-Renaissance radiator, the Elite and Columbia radiators, with top box, base, corner and grouped in all hights. The Bundy Newport radiator, like the Climax, except that it has three barrels instead of two, is also illustrated. The new Bundy giant pipe hanger and the Bundy steam return and tank traps are shown, likewise the Power regulators and the Major elastic couplings, Bundy comfort foot rests and other specialties. The catalogue is of convenient shape and well printed.

THE EXECUTIVE COMMITTEE of the National Association of Master Steam and Hot Water Fitters of the United States are sending from the headquarters in the Cable Building, New York, Official Bulletin No. 5. The feature of this bulletin is the comments on the action of the recently organized supply associations, which action is construed to be opposed to the Trade Resolutions passed on September 20. The bulletin contains a resolution passed by the Eastern Supply Association, a letter in reference to it by John Mitchell, president of the National Association of Master Plumbers, and a letter from the Henry McShane Mfg. Company. The bulletin announces that there are 450 houses manufacturing goods used by its members, of which 126 have expressed themselves in accord with the Trade Resolutions. A full list will be printed and sent to the members in a later bulletin.

THE SCHEDULES in the assignment of Richard M. Johnson and George G. Morris (Johnson & Morris), dealers in steam heating supplies, at 239 and 241 South Fifth avenue, New York, state liabilities $22,810, nominal assets $42,906, actual assets $37,159.

THE CITY COUNCIL of Circleville, Ohio, has passed an ordnance granting the franchise to the Circleville Steam Heating Company, to lay steam pipes in the streets for furnishing heat and power to the citizens. Work on the plant is to begin June 1, 1895.

A NEW CIRCULAR is received from the March-Brownback Stove Company, Pottstown, Pa., showing two views of their Crown water heater. It is of the dome type, with vertical circulation, and has a return flue. It has a 16 inch fire pot and is rated to carry 350 feet of radiation. The circular also gives a table as a guide for calculating the radiation required for buildings.

THE DWYER PLUMBING & HEATING COMPANY of St. Paul, Minn., with a capital stock of $20,000, have filed articles of incorporation with the Secretary of State. The incorporators are John J. Dwyer, Patrick H. Smith and John J. Bailey.

THE AMERICAN BOILER COMPANY will be represented in Illinois by Charles H. Straw, whose headquarters will be at Danville. T. J. Ryan of Milwaukee will represent the above company in Iowa, with headquarters at Des Moines.

THE MORTON TIN PLATE COMPANY, Cambridge, Ohio, started their plant on Wednesday, the 26th ult. These works, which consist of three hot mills, three cold mills and a complete equipment for producing black plates, have been previously described in the columns of *The Metal Worker*. The exceptional circumstances which favored the company during the construction period have continued. During the first three days of operations nearly 50 tons of plates of the best quality were rolled, and it is expected that shipments will commence during this week at the rate of 20 to 25 tons per day. In explaining their action in starting their mills upon a union basis, the company state that while there is little if any apparent margin for profit, they decided to pay the Amalgamated Association scale of wages in preference to incurring the trouble and expense of training inexperienced men, available non-union men not being of a desirable class. The plant was put in operation just four months and six days from the date on which ground was broken.

UNITED STATES IRON & TIN PLATE MFG. COMPANY, Demmler, Pa., expect to have their full complement of 12 tinning sets in operation by next week.

TIN PLATES.

Tin Plates in 1894.

THE PAST YEAR has not been one on which the tin plate trade can look back with any great degree of satisfaction. The trade shouldered its full share of the general business depression which prevailed throughout the United States, and was, moreover, under the spell of disturbing influences peculiar to itself, in the shape of tariff changes and labor difficulties, which will stamp the year 1894 as one of exceptional severity as regards this department. Until the final passage of the Wilson Gorman tariff law, in the middle of August, the trade was hampered and agitated by uncertainty respecting the proposed change in the tariff. When the new law was passed, reducing the duty on tin plates after October 1 from 2.2 cents to 1.2 cents per pound, sales dropped down to very small proportions. Consumers postponed buying beyond the limit of their current needs until they could take advantage of the expected drop in prices which would follow the changed duty, and the trade, for a month, was absolutely stagnant, so far as imported plates were concerned. After the opening of October prices of tin plates underwent a sudden drop, and a somewhat active demand sprang up, which was not, however, as extensive, either in volume or duration, as had been looked for. After a few weeks the trade relapsed into a condition of comparative dullness, which continued until the close of the year.

Reduced Consumption of Plates.

The fact that some of the largest consumers of tin plates closed their factories for a part of the year, and that about all ran them on a restricted scale, necessarily caused a material reduction in the value of tin plates used. The canning industry also passed through a year of unusual dullness, and the demand from this constituency has very largely contracted. Moreover, the inactivity in the building trades was reflected in a considerable decrease in the demand for roofing plates. To such an extent was this falling off felt that the importation of terne almost ceased for a time, the requirements of the roofers being fully met by the American manufacturers. After the new tariff became operative, however, Welsh roofing plates again made their appearance on the market, and a number of the smaller American "dippers," who had been turning these plates out in good quantities, were forced to close down their works altogether.

The Jobbing Trade.

The smaller consumers of both bright and terne plates have been supplying their wants throughout the year in a hand to mouth fashion, taking only such quantities of material as they required for actual use within a very short time, keeping no stocks at all, and expecting every time to be able to make their next purchase at a cheaper rate than the last—an expectation which has been usually justified by the event, the course of prices having been steadily downward from month to month. This peddling method of buying, involving frequent repetitions of orders, caused a kind of spurious activity among the jobbing trade, keeping them generally busy, but with a resultant aggregate of sales far below the volume generally secured with less effort. Altogether the reduced consumption of tin plates in the year just closed must have been very considerable. One of the largest dealers in this city places the falling off at 20,000 tons as compared with 1893—itself a dull year—and 40,000 tons as compared with 1892. The following table, furnished us by the firm referred to, shows a gradual dropping since 1890:

Estimated Consumption of Tin Plates in the United States.

	Tons of 2240 pounds each.
1890	320,000
1891	315,000
1892	300,000
1893	280,000
1894	260,000

The falling off has been most marked in the Eastern States, judging by reports received by us from importers and jobbers. A large firm of importers and dealers in New England place their decrease in the volume of sales at 40 per cent., as compared with the past two years. Another jobbing house in the same section state that their business from January to July was 20 per cent. behind, while from July to December it was between 10 and 15 per cent. less than that of 1893.

An Eastern firm, doing a large tin plate business, report that the volume of their business in the first half of the year was very largely behind that of the previous year, but that in the last half it was a little ahead, the total for the whole year being materially behind that of 1893.

This jobbing house refer to their business as showing a decrease of 10 per cent., owing, however, to lower prices, and not to a reduction in the volume of sales. A large Chicago concern also place their loss in trade at 10 per cent., while yet another in the same city state that their output was materially increased, while the gain in dollars and cents was practically the same as in the previous year.

Competition is generally referred to, both by manufacturers and dealers, as keener than ever, especially in foreign plates, while the margin of profit is uniformly reported to be much less than a year ago.

Prices.

Prices of Welsh plates have been gradually dropping during the year. When the new duty was imposed, on October 1, a sudden drop of from 75 to $1 a box occurred, and a further slight decline has developed since that time. IC, 14 x 20, coke tin plates of Welsh make, which, on January 1, 1894, were quoted in large lots at $5.35 a box, are now quoted at $4, and the end does not seem to be yet, although the lowest prices ever known have been long ago reached. American made tin and terne plates have generally followed suit in the reduction in price, but not to the same extent as the foreign material.

The Outlook.

As regards the prospects for tin plates in the present year, the views of the trade are generally hopeful for a greatly improved business. The impression seems to be that this improvement may not occur at once, but is likely to develop gradually in the course of the year as the existing wage difficulties on both sides of the Atlantic are straightened out.

On this subject a Boston house write as follows:

"It seems to us the prospects for 1895 are much more promising than they were for this year. We judge largely by the condition the manufacturers seem to be in, which appears to be one of great activity, although we have not as yet felt the effects of it ourselves. We think that since the change in the tariff on October 1 the demand for tin plates has increased and it seems liable to still further advance."

Another firm in the New England States allude to the effect of the new tariff as likely to be favorable as regards tin plates. "As the rate of duty is now fixed for a time," they say, "and American makers know what it will be and are increasing their output, the effect will be, we think, to increase the sales of American and reduce those of foreign plates."

From Columbus, Ohio, a leading tin plate firm write on the outlook in that city as follows: "Good, very good.

Half our trade is from this city and we know local demands will increase gradually, though prices, we believe, will be low." This opinion is supported by one of the largest New York importing houses, who anticipate a large business in 1895, but at close margins.

A Pittsburgh concern, doing a large business in that district, write: "We look forward to a very prosperous year. Here in Pittsburgh there is every indication of a large amount of building, and of a substantial kind. This will, of course, cause a greater volume of business in our line of roofing plates."

Chicago correspondents are more conservative in their estimates. One looks for only "a moderate improvement over 1894;" and another "hopes for a gradual improvement," but anticipates "no material increase for the next two years."

The new tariff, by lowering the cost of tin and terne plates, is generally held by jobbers to promise an increase in the consumption and consequently in the demand.

Collections and Credits.

Collections are generally reported as having been very fair. Many consumers, with poor facilities as regards cash and credits, have been obliged to withdraw from the field, and the balance have so well realized the need of conservative action that they have, as a rule, gotten their affairs in better shape than heretofore, and have been able to pay more promptly. In the West this appears to be specially the case. A Chicago house, doing a large jobbing trade in tin plates, say that their customers are, as a rule, in good condition to purchase and pay promptly for goods. The weaker concerns have been weeded out during the stringent times, and a safer trade is looked for.

On this head a Cleveland jobbing concern write as follows:

"We feel that our accounts contracted from now on, in fact, contracted for some time back, are safer than they would have been had we not had the severe depression. All buyers are more conservative, purchasing only what they actually need from month to month, which seems to enable them to meet their bills more promptly. Then the depression has weeded out a good many weak concerns."

And an old established Indianapolis firm of dealers refer to their collections as being greatly improved, 15 per cent. more of their customers discounting their bills than formerly. Their losses from bad debts, they add, were less last year than in any previous year.

In New York City and the Eastern States generally collections are reported to be fully as good, if not better, than formerly, owing possibly, in a measure, to the fact that stock and wages are so reduced that it does not require as much capital to pay for running expenses.

The Domestic Industry.

The growth of the American tin plate manufacturing industry during the year has been phenomenal, despite the repressive effect of a reduced tariff. The quarterly lists of the American works printed in *The Metal Worker*, and the long table of brands of American tin and terne plates now on the market, published herewith, will give some idea of the magnitude of this comparatively young native industry. During the last period for which official reports have been published—namely, the fiscal year ending June 30, 1894, the output of the American works was slightly under 140,000,000 pounds of commercial tin and terne plates. In the third quarter of last year the ratio of increase was undoubtedly proportionately greater, but the labor troubles, following on the reduction of duty on October 1, and the consequent cutting down of wages by the manufacturers, increasing the general closing down of the works, largely restricted the home production during the last quarter of the year.

The wage controversy between the manufacturers and the workmen is still unsettled, in spite of numerous efforts to effect an agreement, and the breach appears wider than ever. A number of the largest mills have already started up on a non union basis and others are preparing to do so. At the end of the year the output was generally increasing again, and it is likely that this quarter will exhibit a further increase in the aggregate output, as several large new mills, now building, are expected to commence operations within the next three months. The industry has taken so firm a hold in this country, and so much capital has been already sunk in it, that it is bound to override all obstacles and forge its way ahead, in spite of foreign competition and temporary impediments in the matter of wages and tariff.

New Works and Extensions.

The additions made to the list of American tin plate mills during the past year have been very numerous. Some of the new works are of the first magnitude, and all are provided with the most modern improvements in the way of tinning machinery and labor-saving apparatus. Probably, at this time, America can show some of the most completely equipped tin plate mills in the world. A few of the smaller dipping plants have gone out of existence as a result of adverse tariff legislation, but the larger works of that kind have stood to their guns and are still turning out large quantities of tin and terne plates, having continued in operation even when the works attached to rolling mills were closed down. None of the larger concerns, notably those manufacturing their own black sheets, which form, of course, the backbone of the industry, have gone out of existence. A large number of concerns have increased their size and capacity by the erection of larger buildings, or by the provision of additional rolling mill or tinning machinery. Some of the original works have been remodeled, in order to adapt them more fully to modern requirements, and a few dipping works have added rolling mills to their plants.

A new and satisfactory feature in the industry is found in the fact that a number of iron making firms have put up or are now building tinning works as an adjunct to their mills. Such has been the case with the Ætna-Standard Iron & Steel Company, at Bridgeport, Ohio; the Canonsburg Iron & Steel Company, at Canonsburg, Pa.; Hughes & Patterson, at Philadelphia; the Old Dominion Iron & Nail Mfg. Company, Richmond, Va., and Lalance & Grosjean Mfg. Company, at Harrisburg, Pa. Among the most recent large plants are those of the Morton Tin Plate Company, Cambridge, Ohio; the Irondale Steel & Iron Company, Middletown, Ind.; Montpelier Sheet & Tin Plate Company, Montpelier, Ind.; the Britton Rolling Mill Company, Cleveland, Ohio, and the Atlanta Steel & Tin Plate Company, Atlanta, Ind., all of which are on the most extensive and substantial scale.

At the present moment some six or eight large tin plate mills are being erected, including those of the Beaver Tin Plate Company, New Lisbon, Ohio; Crescent Sheet & Tin Plate Company, Cleveland, Ohio; Globe Tin Plate Company, Newcastle, Ind.; Goldsmith & Loewenberg, New Kensington, Pa.; La Belle Iron Works, Richmond, Va., and the National Tin Plate Works, Anderson, Ind. All these new works are expected to be in full operation within the next six months, and they will form a very strong addition to the productive capacity of the country.

Quality of American Plates.

The American works are producing both tin and terne plates in all sizes and grades, of a quality equal, and in some instances very superior, to those imported from abroad. The home consumers are becoming largely convinced of the merits of the native plates, and —particularly in the West—are reported to be discarding the use of the foreign article entirely. The American roofing plates have for some time past firmly established their reputation. Many brands of these plates are now almost as well known throughout the United States as the old Welsh standard brands. The bright plates are now coming more and more to the fore, and are by degrees displacing the Welsh material in certain sections.

Views of Manufacturers.

In regard to the outlook for the American tin plate industry, we present herewith extracts from some of the re-

(*Continued on page* 44.)

List of American Manufacturers of Tin and Terne Plates and Their Brands.

JANUARY 5, 1895.

Name of manufacturing firm.	Location of works.	Tinning sets. No.	Tinning sets. In operation	Whether rolling black sheets.	NAMES OF BRANDS. Bright tin plates. Charcoal.	Bright tin plates. Coke.	Terne plates.	REMARKS.
Ætna-Standard Iron & Steel Co	Bridgeport, Ohio	3	....	Yes.	Ætna	Ætna	Belmont, Belmont Special, Belmont Extra.	
American Tin Plate Co	Elwood, Ind	15	10	Yes.	Elwood. Leeds	Elwood	Elwood, Indiana.	
American Tin & Terne Plate Co	Philadelphia, Pa.	....	....	....				
American Tin Plate Machine & Mfg. Co.	Linfield, Pa	4	4	No.			* Linfield, * Tandem, Barto, Ætna, Merlon, Mingo, Saratoga, Pencoyd	* Continuous roofing.
American Stamping Co	Brooklyn, N. Y.	....	....	No.				Make bright plates for their own use only.
Apollo Iron & Steel Co	Apollo, Pa.	6	1	Yes.			Apollo Best Roofing.	
Atlanta Steel & Tin Plate Co	Atlanta, Ind.	8	4	Yes.	Atlanta	Atlanta	Atlanta.	
Baltimore Steel, Iron & Tin Plate Co.	Baltimore, Md.	....	....	Yes.				Reconstructing and enlarging works.
Beaver Tin Plate Co.	New Lisbon, Ohio	....	....	†				Building.
Black Diamond Tin Plate Works.	Philadelphia, Pa.	4	4	No.	Arrow, Black Diamond, Horse Shoe, Imperial, Peerless	B ◇ D Coke	Arrow, Black Diamond, Horse Shoe, Laurel, Quaker City.	
Blairsville Rolling Mill & Tin Plate Co.	Blairsville, Pa.	5	....	Yes.				
Britton Rolling Mill Co	Cleveland, Ohio	3	....	Yes.	Britton's Best Buckeye, Britton's Buckeye	Buckeye Coke	B. B. B. Roofing, B. B. Roofing, B. Roofing.	
Canonsburg Iron & Steel Co	Canonsburg, Pa.	3	....	Yes.	Flag		Down	Operation temporarily suspended.
Chicago Stamping Co	Chicago, Ill.	5	5	No.				Make bright plates for their own use.
Cincinnati Corrugating Co	Piqua, Ohio	1	1	No.			Piqua.	
Crescent Sheet & Tin Plate Co.	Cleveland, Ohio.	....	....	†				Building.
Duquesne Tin Plate Works	Pittsburgh, Pa.	5	5	No.			Iron City, Soho.	
East River Lead Co	New York, N. Y.	2	....	No.				Operation suspended.
Ellwood Tin Plate Co	Ellwood City, Pa.	....	....	Yes.				About to commence operations.
Follansbee Bros. Co	Pittsburgh, Pa.	..	....	No.	Clifton		Allegheny, Braddock, Duquesne, Kenton, Lionel, Neville, Oakmont, Orbit, Pittsburgh, Raymond, Scott's Extra Coated, Sherwood, Thurso, Triumph, Old Style.	
Globe Tin Plate Co	New Castle, Ind.	....	....	....				
Griffiths & Cadwallader	Pittsburgh, Pa.	5	3	No.	Petunia, Primrose		Optimus, N F.	Building.
Goldsmith & Lowenberg	New Kensington, Pa.	10	....	†				
Great Western Tin Plate Co.	Joliet, Ill.	2	2	†		Swansea	Cardiff.	Building.
Gummey, Spering & Co	Philadelphia, Pa.	4	4	†	Climax, Colonial, Mars, Neptune, Phœnix, Stag, Sun, Victor		Alderly, Anchor, Climax, Continental, Eagle, Flag, Hercules, Leominster, Extra Coated, Liberty, Phœnix, Pennsyl Old Method, Pioneer, Venus, X. L. C. R.	
Hamilton, John	Pittsburgh, Pa.	3	3	No.	Ivy, Pansy, Plorama	Pink	Bonus, Hamilton's Best Redipped, Hazlewood, Killbuck, Lulu, Mingo Old Process, Osceola Old Style.	
Henderson Tin Plate Co	Norristown, Pa.	....	....	....				
Hughes & Patterson, Incorporated	Philadelphia, Pa.	6	....	Yes.	Cherokee, H. & P. Best Bright, Mohawk, Seminole		Delaware, H. & P. Best Roofing, H. & P. Redipped, Roofing, Huron, Oneida	Operations suspended.
Irondale Steel & Iron Co	Middletown, Ind.	8	2	Yes.	Crane BB	Crane C	Crane Terne.	
La Belle Iron Works	Wheeling, W. Va.	....	....	†				Building.
Lalance & Grosjean Mfg. Co.	Harrisburg, Pa.	....	....	Yes.				Building tinning department.
Laufman Tin Plate Co.	Butler Junction, Pa.	4	2	Yes.			Allegheny, Freeport, Laufman's Apollo, Tip Top.	
Marshall Bros. & Co.	Philadelphia, Pa.	....	....	....				
Merchant & Co., Incorporated	Philadelphia, Pa.	8	8	No.	Florence, Minerva, Palma, Pisa	Leslie	Alaska, Arch, Crescent, Empire, Hand Coated, Hickory, Merchant's Old Method, Merchant's Roofing, Palm, Special Extra Coated.	
Meurer Bros. Co.	Brooklyn, N. Y.	7	7	No.	Century, Florida	Brooklyn, Climax	Excelsior, Flushing, Grace, Meurer Old Method, Meurer Roofing, Pullman, Standard, Superior.	
Montpelier Sheet & Tin Plate Co.	Montpelier, Ind.	12	....	†				Building.
Morewood Co.	Gas City, Ind.	12	12	Yes.	Dorothy, Grace, Jack	R. H. J.	F. W. B., H. C. B., J. H. R., P. T. L.	
Morton Tin Plate Co	Cambridge, Ohio	4	....	Yes.	Morton	Guernsey	Leatherwood.	
National Tin Plate Co.	Anderson, Ind.	10	....	†				Building.
New Castle Steel & Tin Plate Co	New Castle, Pa.	12	....	Yes.	New Castle Best Palm, New Castle Palm, New Castle Charcoal, New Castle S. Charcoal	New Castle Palm Coke, New Castle Coke	Juniati, New Castle Old Method, New Castle Palm.	
Norristown Tin Plate Co.	Norristown, Pa.	....	....	....				
Norton Bros.	Maywood, Ill.	16	....	No.				Make bright plates for their own use only at present.

Old Dominion Iron & Nail Works	Richmond, Va	2	2	†	Belle Isle, Belmont	Bellevue, Belona	Albemarle, Chesapeake, Green Brier, Indian, Kanawha, Potomac, Rivanna, York.
Philadelphia Tin Plate Co	Philadelphia, Pa	3	3	No.			Elziver, Enid, Madison, Sharon, Triumph, Trotter's American New Method, Trotter's Roofing, Trotter's Special.
Phillips Tin Plate Co	Philadelphia, Pa	5	5	No.	Century, Oak	Gladys, Walnut	Boston, Columbus, Filbert, National, Phillips' Roofing, Republic, Waldo's Roofing, Zero.
Pittsburgh Tin Plate Works	New Kensington, Pa	6	6	Yes.	Kensington	Amber	Amber, Kensington.
Record Mfg. Co	Conneaut, Ohio	2	1	No.	Record Charcoal A, Record Charcoal A1.	Record Coke.	
St. Louis Stamping Co	St Louis, Mo	17	17	Yes.	Granite, St. Louis	Steel Coke	Acme, Alta, Extra Fine, S. G., S. L. S. Old Process.
Simpson (Wm. T.) & Co	Cincinnati, Ohio	3	2	No.			Boaz.
Somerton Tin Plate Works	Brooklyn, N. Y	3	3	Yes.	Somerbrook, Somerton.		
Taylor (N. & G.) Co	Philadelphia, Pa	20	20	No.	Brilliant, Linden, Merion, Royal, Taylor's Hand Dipped	Almond, Locust Mint.	Columbia, Genuine Old Style, Globe, Knoxall, Maple, Old Method, Spruce, Taylor Roofing Tin, Willow.
Thomson (A. A.) & Co	New York, N. Y	3		No.			Central, Old Colony, Tarn. Thomson's Puritan.
United States Iron & Tin Plate Mfg. Co.	Demmler, Pa	12	6	Yes.	U. S. Bright, Versailles, Youghiogheny		U. S. Eagle, U. S. Grant, U. S. Monongahela, U. S. Redipped.
Wallace, Banfield & Co., Ltd	Irondale, Ohio	10	7	Yes.	Irondale AAA AA A B	Irondale C	Irondale B A AA AAA WB

†Preparing to make black plates.

Alphabetical List of Brands of American Tin and Terne Plates

BRIGHT CHARCOAL PLATES.

Name of Brand.	Maker.
Ætna	Ætna-Standard Iron & Steel Co.
Arrow	Black Diamond Tin Plate Works.
Atlanta	Atlanta Tin Plate Co.
Belle Isle, Belmont	Old Dominion Iron & Nail Works Co.
Black Diamond	Black Diamond Tin Plate Works.
Brilliant	N. & G. Taylor Co.
Britton's Best Buckeye, Britton's Buckeye	Britton Rolling Mill Co.
Century	Meurer Bros. Co.
Century	Phillips Tin Plate Co.
Cherokee Bright	Philadelphia Iron & Tin Plate Works.
Climax, Colonial	Gummey, Spering & Co.
Crane BB	Irondale Steel & Iron Co.
Dorothy	The Morewood Co.
Elwood	American Tin Plate Co.
Florence	Merchant & Co., Inepd.
Florida	Meurer Bros. Co.
Grace	The Morewood Co.
Granite	St. Louis Stamping Co.
H. & P. Best Bright	Philadelphia Iron & Tin Plate Works.
Horse Shoe, Imperial	Black Diamond Tin Plate Works.
Irondale	Wallace, Banfield & Co., Ltd.
Ivy	John Hamilton.
Jack	The Morewood Co.
Kensington	Pittsburgh Tin Plate Works.
Linden	N. & G. Taylor Co.
Mars	Gummey, Spering & Co.
Merion	N. & G. Taylor Co.
Minerva	Merchant & Co., Inepd.
Mohawk	Philadelphia Iron & Tin Plate Works.
Morton	Morton Tin Plate Co.
Neptune	Gummey, Spering & Co.
New Castle Best Palm, New Castle Charcoal, New Castle Palm Charcoal, New Castle S. Charcoal	New Castle Tin Plate Co.
Oak	Phillips Tin Plate Co.
Palma	Merchant & Co., Inepd,
Pansy	John Hamilton.
Peerless	Black Diamond Tin Plate Works.
Phœnix	Gummey, Spering & Co.
Pisa	Merchant & Co., Inepd.
Florama	John Hamilton.
Primrose	Griffiths & Cadwallader.
Record Charcoal	Record Mfg. Co.
R. H. J	The Morewood Co.
Royal	N. & G. Taylor Co.
Seminole	Philadelphia Iron & Tin Plate Works.
Somerbrook, Somerton	Somerton Tin Plate Works.
Stag	Gummey, Spering & Co.
St. Louis	St. Louis Stamping Co.
Sun	Gummey, Spering & Co.
U. S. Bright, Versailles	United States Iron & Tin Plate Mfg. Co.
Victor	Gummey, Spering & Co.
Youghiogheny	United States Iron & Tin Plate Mfg. Co.

BRIGHT COKE PLATES.

Ætna	Ætna-Standard Iron & Steel Co.
Almond	N. & G. Taylor Co.
Amber	Pittsburgh Tin Plate Works.
Atlanta	Atlanta Tin Plate Co.
B D	Black Diamond Tin Plate Works.
Bellevue, Belona	Old Dominion Iron & Nail Works Co.
Brooklyn	Meurer Bros. Co.
Buckeye	Britton Rolling Mill Co.
Climax	Meurer Bros. Co.
Crane C	Irondale Steel & Iron Co.
Elwood	American Tin Plate Co.
Flag	Canonsburg Iron & Steel Co.
Gladys	Phillips Tin Plate Co.
Guernsey	Morton Tin Plate Co.
Leeds	American Tin Plate Co.
Leslie	Merchant & Co., Inepd.
Locust	Baltimore Steel, Iron & Tin Plate Co.
Locust, Mint	N. & G Taylor Co.
New Castle Coke, New Castle Palm Coke	New Castle Tin Plate Co.
Petunia	Griffiths & Cadwallader.
Pink	John Hamilton.
Record Coke	Record Mfg. Co.
Steel Coke	St. Louis Stamping Co.
Swansea	Great Western Tin Plate Co.
Walnut	Phillips Tin Plate Co.

TERNE PLATES.

Acme	St Louis Stamping Co.
Alaska	Merchant & Co., Inepd.
Albemarle	Old Dominion Iron & Nail Works Co.
Alderly	Gummey, Spering & Co.
Allegheny	Follansbee Bros. Co.
Allegheny	Lautman Tin Plate Co.
Alta	St. Louis Stamping Co.
Amber	Pittsburgh Tin Plate Works.
Anchor	Gummey, Spering & Co.
Apollo Best Roofing	Apollo Iron & Steel Co.
Arch	Merchant & Co., Inepd.
Arrow	Black Diamond Tin Plate Works.
Atlanta	Atlauta Tin Plate Co.
Barto	American Tin Plate Machine & Mfg. Co.
B. B. B. Roofing, B. B. Roofing, B. Roofing	Britton Rolling Mill Co.
Belmont, Belmont Extra, Belmont Special	Ætna-Standard Iron & Steel Co.
Black Diamond	Black Diamond Tin Plate Works.
Boaz	Wm. T. Simpson & Co.
Bonus	John Hamilton.
Boston	Phillips Tin Plate Co.
Braddock	Follansbee Bros Co.
Cardiff	Great Western Tin Plate Co.
Central	A. A. Thomson & Co.
Chesapeake	Old Dominion Iron & Nail Works Co.
Climax	Gummey, Spering & Co.
Columbia	N. & G. Taylor Co.
Columbus	Phillips Tin Plate Co.
Crane Terne	Irondale Steel & Iron Co.
Crescent	Merchant & Co., Inepd.
Dawn	Canonsburg Iron & Steel Co.
Delaware	Philadelphia Iron & Tin Plate Works.
Duquesne	Follansbee Bros. Co.
Eagle	Gummey, Spering & Co.
Elwood	American Tin Plate Co.
Elziver	Philadelphia Tin Plate Co.
Empire	Merchant & Co., Inepd.
Enid	Philadelphia Tin Plate Co.
Etna	American Tin Plate Machine & Mfg. Co.

Excelsior	Meurer Bros. Co.
Extra Fine	St. Louis Stamping Co.
Filbert	Phillips Tin Plate Co.
Flag	Gummey, Spering & Co.
Flushing	Meurer Bros. & Co.
Freeport	Laufman Tin Plate Co.
F. W. B.	The Morewood Co.
Genuine Old Style	N. & G. Taylor Co.
Globe	N. & G. Taylor Co.
Grace	Meurer Bros. Co.
Greenbrier	Old Dominion Iron & Nail Works Co.
Hamilton's Best Re-Dipped	John Hamilton.
Hand Coated	Merchant & Co., Incpd.
Hazlewood	John Hamilton.
H. C. B	The Morewood Co.
Hercules	Gummey, Spering & Co.
Hickory	Merchant & Co., Incpd.
Horse Shoe	Black Diamond Tin Plate Works.
H. & P. Re-Dipped Roofing	Philadelpha Iron & Tin Plate Works.
H. & P. Best Roofing	
Huron	
Indian	Old Dominion Iron & Nail Works Co.
Indiana	American Tin Plate Co.
Iron City	Duquesne Tin Plate Works.
Irondale	Wallace, Banfield & Co., Ltd.
Irving	American Tin & Terne Plate Co.
J. H. R.	The Morewood Co.
Juniati	New Castle Tin Plate Co.
Kanawha	Old Dominion Iron & Nail Works Co.
Kensington	Pittsburgh Tin Plate Works.
Kenton	Follansbee Bros. Co.
Kilbuck	John Hamilton.
Knoxall	N. & G. Taylor Co.
Laufman's Apollo	Laufman Tin Plate Co.
Laufman's Roofing Tin	P. H. Laufman & Co., Ltd.
Laurel	Black Diamond Tin Plate Works.
Leatherwood	Morton Tin Plate Co.
Leominster	Gummey, Spering & Co.
Liberty	
Linfield	American Tin Plate Machine & Mfg. Co.
Lionel	Follansbee Bros Co.
Lulu	John Hamilton.
Madison	Philadelphia Tin Plate Co.
Maple	N. & G. Taylor Co.
Merchant's Old Method	Merchant & Co., Incpd.
Merchant's Roofing	
Merion	American Tin Plate Machine & Mfg. Co.
Meurer's Old Method	Meurer Bros. Co.
Meurer's Roofing	
Mingo	American Tin Plate Machine & Mfg. Co.
Mingo Old Process	John Hamilton.
National	Phillips Tin Plate Co,
Neville	Follansbee Bros. Co.
New Castle Old Method	New Castle Tin Plate Co.
Newcastle Palm	
N. F	Griffiths & Cadwallader.
Oakmont	Follansbee Bros. Co.
Old Colony	A. A. Thomson & Co.
Old Method	N. & G. Taylor Co.
Oneida Roofing	Phildelphia Iron & Tin Plate Works.
Optimus	Griffiths & Cadwallader.
Orbit	Follansbee Bros. Co.
Osceola Old Style	John Hamilton.
Palm	Merchant & Co , Incpd.
Pencoyd	American Tin Plate Machine & Mfg. Co.
Penllyn	Philadelphia Tin Plate Co.
Pennsyl Old Method	Gummey, Spering & Co.
Phillips' Roofing	Phillips Tin Plate Co.
Phœnix	Gummey, Spering & Co.
Pioneer	
Piqua	Cincinnati Corrugating Co.
Pittsburgh	Follansbee Bros. Co.
Potomac	Old Dominion Iron & Nail Works Co.
P. T. L.	The Morewood Co.
Pullman	Meurer Bros. Co.
Quaker City	Black Diamond Tin Plate Works.
Raymond	Follansbee Bros. Co.
Republic	Phillips Tin Plate Co.
Rivanna	Old Dominion Iron & Nail Works Co.
Sanatoga	American Tin Plate Machine & Mfg. Co.
Scott's Extra Coated	Follansbee Bros. Co.
S. G	St. Louis Stamping Co.
Sharon	Philadelphia Tin Plate Co.
Sherwood	Follansbee Bros. Co
S. L. S., Old Process	St. Louis Stamping Co.
Soho	Duquesne Tin Plate Works.
Special Extra Coated	Merchant & Co., Incpd.
Spruce	N. & G. Taylor Co.
Standard	Meurer Bros. Co.
Superior	
Tandem	Merchant & Co., Incpd.
Tarn	A. A. Thomson & Co.
Taylor Roofing Tin	N. & G. Taylor Co.
Thomson's Puritan	A. A. Thomson & Co.
Thurso	Follansbee Bros. Co.
Tip Top	Laufman Tin Plate Co.
Trotter's American New Method	Philadelphia Tin Plate Co.
Trotter's Roofing	
Trotter's Special	
Triumph	
Triumph, Old Style	Follansbee Bros. Co.
U. S. Eagle	United States Iron & Tin Plate Mfg. Co.
U. S. Grant	
U. S. Monongahela	
U. S. Redipped	
Venus	Gummey, Spering & Co.
Waldo's Roofing	Phillips Tin Plate Co.
Willow	N. & G. Taylor Co.
X. L. C. R	Gummey, Spering & Co.
York	Old Dominion Iron & Nail Works Co.
Zero	Phillips Tin Plate Co.

Dealers' Special Brands.

BRIGHT CHARCOAL PLATES.

Name of Brand.	Dealer's Name and Address.
Home	Canton Steel Roofing Co., Canton, Ohio.
Mohawk	Hibbard, Spencer & Bartlett, Chicago, Ill.
Pawnee	
Silver Star	J. M. & L. A. Osborn, Cleveland, Ohio.
Tower	Canton Steel Roofing Co., Canton, Ohio.

BRIGHT COKE PLATES.

Glanshire	Hibbard, Spencer & Bartlett, Chicago, Ill,
Old Hundred	
Osborn	J. M. & L. A. Osborn, Cleveland, Ohio.
F. W. B	Hibbard, Spencer & Bartlett, Chicago, Ill.
Yale	Canton Steel Roofing Co., Canton, Ohio.

TERNE PLATES.

Buffalo Best	Sidney Shepard & Co., Buffalo, N. Y.
Coe O. S	Jas. A. Coe & Co., Newark, N. J.
C. S. R., Canton	Canton Steel Roofing Co., Canton, O.
C. S. R., Fargo	
Dunlap's Domestic	John Dunlap & Co., Pittsburgh, Pa.
Dunlap's Double Dipped.	
Eureka	J. M. & L. A. Osborn, Cleveland, Ohio.
Furmston	C. Sidney Shepard & Co., Chicago, Ill.
Golden Star, Old Style	J. M. & L. A. Osborn, Cleveland, Ohio.
Iroquois	Hibbard, Spencer & Bartlett, Chicago, Ill.
J. L. O	J. M. & L. A. Osborn, Cleveland, Ohio.
Kenwood	C. Sidney Shepard & Co., Chicago, Ill.
Lion	Geo. E. Merry, New York.
Nava	J. M. & L. A. Osborn, Cleveland, Ohio.
Niagara	Hibbard, Spencer & Bartlett, Chicago, Ill.
Oneida	Jas. A. Coe & Co., Newark, N. J.
Osborn	J. M. & L. A. Osborn, Cleveland, Ohio.
Osborn's Old Process	
Osborn Roofing	
Pawnee	Hibbard, Spencer & Bartlett, Chicago, Ill.
Petrel	Bruce & Cook, New York.
Seneca	Sidney Shepard & Co., Buffalo, N. Y.
Snow Drop	Jas. A. Coe & Co., Newark, N. J.
Staple	
Star	J. M. & L. A. Osborn, Cleveland, Ohio.
Westmoreland	C. Sidney Shepard & Co., Chicago, Ill.
W. T. R	Bruce & Cook, New York.

(*Continued from page* 41.)

ports with which we have been favored by the domestic manufacturers:

An Ohio manufacturer writes as follows:

"As the wage question in tin mills has not been settled, the prospects of doing business in the early part of the new year are not promising. We think, however, that there will be a fair amount of business by spring, increasing as the year grows older, provided capital does not get scared at the agitation of new financial schemes. We do not anticipate having what we call 'good business' until some time during '96, and possibly not until '97 has shown its colors. The improvements in tin plate manufacture, that is 'individual improvements,' have been minor. Being a new industry, improvements have been general, more especially in general arrangement, concentrating the different departments to save labor as much as possible, and thus lessen cost of production."

An Eastern manufacturer gives it as his opinion that business in his line in the early spring will be very brisk. The new tariff, he remarks, has somewhat demoralized the industry, as Welsh competition is giving the manufacturers all they can do to hold their own, but this difficulty they expect to overcome in time. He adds that he is continually experimenting in order to reduce costs, and has been able during the past year to do so in several directions.

A manufacturing firm in Philadelphia remark:

"The tariff has had the effect of reducing prices and, what is worse, bringing in inferior plates of every conceivable weight except the standard. It has also stimulated us to put in more improved machinery by which we can meet the reduction."

In regard to the outlook for American tin plates, the writers say:

"We consider the prospects for 1895 very favorable, for the reason that the brands of American plates are becoming better known and are being ordered in increasing quantities in preference to foreign. This being so, especially for the last six months, we naturally look for a still greater improvement in this direction, as the foreign article is certainly deteriorating in quality and finish to meet competition."

An Ohio concern manufacturing bright tin plates write to the following effect:

"We have spent six weeks visiting our trade and getting the pulse of business, traveling nearly 5000 miles during that time, and having interviews with some of the foremost business men of the country. The generally hopeful feeling of the trade is apparent in almost every direction, although every one is feeling that profits are not commensurate with the efforts that are required to obtain business; nevertheless, there is a larger volume of business than heretofore, and every one feels, as far as our observation goes, that the coming year offers a much more hopeful outlook than a year ago. The cost of production to manufacturers, while it has been reduced by lower material, yet there is a demoralizing condition of the market which has caused a much greater decline in the price of their production than the cost would warrant, and we feel that if trade revives there must be a reaction, to a certain extent, in the recovery of prices, though that may be some time in the future. There is one point that is largely against the manufacturers of tin plate in this country, and that is the co-operation of the steamship lines

with our railroads, making Western deliveries almost on a par with seaboard deliveries. The Detroit, Chicago and Western shipping points are contracting for foreign tin to be laid down in their cities at a much less rate of freight than is charged by our railroads from the seaboard to these points. This is a great discrimination on the part of the railroads to encourage foreign shipments and a great drawback on our tin plate industry."

One of the largest manufacturing firms in this country, located in Ohio, report a very favorable trade up to October 1, when their works were closed down on account of the new tariff and pending adjustment of wsges. They regard the outlook as fair, and are among those who have decided to run their plant non-union, which they expect to be able to do with little difficulty.

Improvements in Manufacture.

Great strides have been made during the past year in the directlon of improvements in tin plate machinery and in the general appliances connected with the industry. The American genius for inventing has evolved some remarkable labor-saving machinery, and new tinning machines, pickling machines and apparatus for handling, cleaning, polishing and even sorting and packing the plates have been among the developments of the year for which patents have been applied and awarded. New processes for facilitating manufacture and improving the product are being constantly adopted in all the works.

Tin Plate Machinery.

Several firms have embarked in the manufacture of tin plate machinery as a specialty, and the industry has already become a very important one. These firms have all enjoyed an excellent business during the year in ministering to the needs of the numerous manufacturing concerns that have been building or adding to their plants.

American Black Plates.

The number of tin-plate plants that manufacture their own black plates has grown materially. Nearly all the latest additions to the list of American makers combine the two lines, while a large number of rolling mills have added, or are adding, tin mills for the production of plates for tinning purposes. The quality of the American black plates is admittedly excellent, and these are unlformly preferred by the dipping firms to the foreign material. Latterly the alteration in the duty on tinned and black plates has made the use of the domestlc plates almost prohibltive to those manufacturing firms who do not roll thelr own material, and they have been forced, for economy's sake, either to revert to the use of imported plates or to shut down altogether. This diffi culty soon may, and probably wlll, be surmounted when the wage question is settled and the manufacturers are able to reduce the price of Amerlcan plates through reductions in the price of labor and the adoption of more economical processes, although black plates are already down to the lowest price known.

A number of iron and steel mills have erected tin mills during the year, and the production of black plates for tinning is likely to be immensely augmented this year. So far, the supply has been hardly adequate to the demand, and in the busiest quarter of last year—that ending September 30—the complaint was often heard from the tin plate makers of inability to obtain a sufficient supply of black plates to keep their works running as actively as their volume of orders necessitated. This drawback will probably not be again felt.

The use by the tin plate makers of black plates rolled in the United States, in place of the imported article, has grown substantially, and at the present time it is estimated that 75 to 80 per cent. of American tin and terne plates are made from American steel and iron sheets. Colonel Ayer's last report, for the quarter ended June 30, 1894, gave 73 per cent. as the proportion at that time.

Palm Oil.

Through the first effect of the new tariff law on the tin plate industry, there was some falling off in the volume of business done in palm oil. For the past six months, however, there has been about double the trade of the last six months of 1893, and as the demand has taken on some degree of strength, competition has correspondingly increased, with a tendency to reduce the margin of profit.

The Tin Plate Market.

We print, in conclusion, an interesting memorandum on the tin plate market for the past year, issued by the old and well-known firm of Bruce & Cook of this city, which contains a review of the situation from the jobber's point of view. They write, on January 1, 1895, as follows:

The history of the tin plate market during 1894 was a gradual decline in price by makers, and a sudden drop October 1, when the new rate of duty took effect. The very low prices obtaining for steel and pig tin have made possible the lowest prices on tin and terne plates ever known, and this with a duty of $1.20 per 100 pounds, or about 50 to 60 per cent. of the present value of plates used by canners and terne plates used for roofing. The causes for this decline may be found in the overproduction of steel, and under improved methods at low prices—the low prices for pig tin, owing partly to the low rate of silver, and the operations of a tin syndicate and those opposed to it. As labor, steel and fuel are by far the most important items entering into the cost of tin plate, any change in these may be taken as a sure and quick guide as to future value of plates.

A comparison of prices ruling in the latter part of December in large lots may be of interest:

	1894.	1893.	1892.	1891.	1890.	1889.
Steel rails, per ton	$22.00	$24.00	$30.00	$30.50	$28.50	$34.00
IX pig iron, per ton	11.25	13.50	14.25	16.00	16.00	18.00
Straits tin, per ton	314.00	465.00	440.00	448.00	454.00	470.00
Straits tin duty, per ton	Free.	89.60	89.60	Free.	Free.	Free.
Pig lead, per ton	72.00	74.00	84.00	95.00	92.00	88.00
IC 14 x 20 coke tin, per box	4.00	5.35	5.38	5.35	5.20	4.80
IC 14 x 20, duty, per box	1.29	2.36	2.36	2.36	2.36	1.07
Import price, less duty	$2.71	$2.99	$3.02	$2.99	$2.84	$3.73

The resources of this country are very great for almost every known commodity and, for many of them, far exceed those of any other country. Our home market is an exceedingly large and important one and should be served by producers on terms as favorable as to any other, but we should not be content with this alone. We must do an international trade, and to do this we must give our producers and manufacturers the best market to buy in. We must be a nation among nations, able to reach the best of the world's markets for both buying and selling, but, above and beyond all, we must have a system of currency and finance not useful in our own country alone, but available the world over. A United States dollar should be such that it will be recognized and accepted for a dollar value at sight, wherever or whenever seen. No other kind should be issued. As "no man liveth to himself," so it will be with nations. We hope for wise legislation at Washington on the currency question, and with as little delay as is consistent with wisdom.

Values do not usually remain at the lowest point very long. We believe that they are there now, and that there are evidences of a better demand, a revival of industries, after nearly two years of prostration. Let those who guide labor and those who control capital study each other's interests, work in harmony for a common end, and we are sure the trade of the country will right itself, giving to all honest men an honest return for honest labor.

The Coal Mining Situation.—The joint convention of coal operators and miners of the Pittsburgh district, held in that city on Friday, the 28th ult., adjourned without reaching a settlement of a wage rate to be effective until May 1 next. The question was left to a committee consisting of three operators, three miners and three disinterested citizens of Pittsburgh. This committee is expected to meet in conference in about two weeks, and in the mean time the district rate for Pittsburgh will remain at 55 cents, the price adopted by the Railroad Coal Operators' Association. John Burns, M. P., the well-known labor leader of England, and M. M. Garland, of the Amalgamated Association, were both present at the above conference.

Plans for nearly 2600 buildings, at an estimated cost of $51,300,000, have been submitted in New York City during the past year, a slight increase over 1893, if the Cathedral of St. John the Divine be excluded.

STOVE TRADE NOTES.

The Stove Trade of 1894.

BY GEO. W. COPE.

Review of the Year.

STOVE MANUFACTURERS should congratulate themselves that the worst year known in recent times is over. With no absolute certainty as to the developments of the future, they can at least hope that 1895 will show a material increase in the volume of business. And it is entirely reasonable and in accordance with natural laws that this should be the case. The year following a severe financial panic is always a period of depression, for recuperation is a slow process. It is estimated that the trade of 1894 in regular lines of coal and wood stoves was about one third less than that of 1893. This is due to the very light sales in the first six months of the year, as compared with the excellent demand in the corresponding period of 1893. It must be borne in mind that the panic of the latter year occurred in June. Hence the latter half of 1893 felt its brunt, and genuine recovery did not set in until 1894 was well spent. The improvement in the last few months of the year was not sufficient to compensate for the dullness of the first part.

The trade reports published in our columns from time to time during the year very accurately set forth the prevalence of these conditions. New England, New York, Philadelphia, Baltimore, Cincinnati, Chicago and St. Louis substantially agreed that the first quarter of 1894 showed but slight recovery in their several sections. Each month marked a little gain over that preceding, but the increased business was not enough to restore even a semblance of activity for either manufacturers or merchants. Stove foundries ran spasmodically. There were frequent reports in our news items of foundries starting up, only to be followed in a short time by statements that the same foundries had been obliged to shut down until accumulated stocks could be worked off. Manufacturers with plenty of capital, or with facilities for securing the necessary money, ran steadily on short time to enable their workmen to live, even though warehouses were filled to overflowing, showing themselves practical philanthropists.

The second quarter of the year was but little better than the first. New England reported a very conservative feeling among dealers, who were unwilling to increase their trade by selling stoves on credit to workingmen on short time and reduced pay. New York admitted that a demand which set in on the opening of spring had been short lived. Philadelphia found more business doing, but most buyers hesitating about placing orders in advance of their actual requirements. Chicago testified to an intermittent trade, varying from satisfactory orders in exceptionally prosperous localities to no demand whatever in sections still suffering from business prostration. St. Louis appeared at this time to be in best shape, having been benefited by cut freight rates to outlying districts, during the prevalence of which the St. Louis manufacturers and merchants had been able to reduce their stocks. June saw many Western foundries compelled to suspend operations on account of the coal miners' strike, which cut off their supply of coke. The shortage of coal was for a time so serious that it caused a little boom in gasoline and oil stoves in the very heart of the Western coal mining regions. July was dull in the East, but fairly active in the West, where the approach of harvest, with its prospect of ready money then in farmers' hands, gave dealers more courage to order stocks. But August saw blighted hopes, as the July railroad strikes had injured general business, checking the operations of innumerable local industries, while nature joined forces with man to ruin the trade by the prevalence of scorching winds, which burned up vegetation over a wide expanse of country in the West. Disheartened merchants countermanded their orders.

September and October, however, witnessed a decided change, particularly in the West. It was found that only Western Kansas and Nebraska and portions of South Dakota were actually suffering from crop failures due to drought and hot winds. Iowa, being an older State, with farmers who had enjoyed many years of prosperity, proved itself superior to one season of short crops. Other Western States were blessed with good crops, and the Southwest was particularly well favored. Hence the demand for stoves assumed something of its old-time activity, being far better than for the corresponding period of 1893. November was, in the main, an excellent month, but the weather was unseasonably mild, causing a falling off in the demand for heating stoves. December was a quiet month, as usual, trade being confined to small shipments to meet the requirements of dealers with occasional customers.

Several features of the trade of 1894 call for special reference. It was a hard year on traveling salesmen. So many uncertainties clouded the business sky that dealers placed very small orders, and then only when they were positively certain that they could sell the goods. Hence, salesmen were obliged to canvass their districts frequently, so as to be sure to catch the dealer ready to buy. Another feature was the great demand for stove repairs. All sorts of odd castings were called for, some of which had not been in demand for years, showing that parts of stoves were being renewed which in good times would cause owners to discard the stoves and buy new ones. Large stove companies found their repair department a much more important source of revenue than ever before. Irregularity in prices became a fruitful source of annoyance in some localities, owing to the ambition of some manufacturers to extend their trade, regardless of the absolute certainty that they would only reap a temporary advantage from the inauguration of such a policy. If it had been continued it would have merely resulted in the lowering of competitors' prices, so that the last stage of the trade would have been worse than the first, because nobody would have increased his volume of business, but would, perhaps, have sacrificed all his profits on his still meager sales. Another interesting feature was the continued growth of the business in steel ranges. It is believed that more of these were sold in 1894 than in any previous year, as prominent manufacturers, making steel ranges a specialty, were frequently considerably in arrears on deliveries. The manufacturers of oil heating stoves also did well, as compared with previous years, their circle of consumers steadily widening.

Freight Questions.

In connection with the course of trade the subject of freight rates comes up very closely. Several important developments took place in this line during the year. The Southern manufacturers suffered seriously by the imposition of prohibitory rates on stoves to Northern points in the latter part of 1893. Several of the Southern foundries had until then enjoyed an outlet in Northern markets which was of much importance to them, but this was suddenly cut off, and the loss of trade was

so great that they were compelled to shut down. The manufacturers used their utmost endeavors to have the rates reduced, but it was not until the latter part of September, 1894, that they were successful. The importance of the reduction may be seen from the statement that the charges per hundred pounds from Chattanooga to Cincinnati were changed from 47 cents to 19 cents. The Western stove manufacturers also had their bit of experience of a slightly different character. In November they learned that the Western Classification Committee of the railroads had decided that after January 1, 1895, the classification on stoves in less than carload lots should be raised from third to second class, and, at the same time, the minimum weight of a carload should be increased from 20,000 pounds to 24,000 pounds. The change thus ordered involved an advance of 25 to nearly 50 per cent. in the rates of freight on all Western business. It was the unanimous opinion of the stove trade that conditions did not warrant any advance in freight rates. The cost of stoves to Western consumers would thus be so enhanced as to threaten a serious restriction of the demand. Efforts were accordingly made at once to induce the railroad companies to rescind their action. So much pressure was brought upon the managers by manufacturers and merchants that a special meeting of the Classification Committee was called in December, at which the new classification was reconsidered and the old one restored, with the understanding that no change shall be made for at least the next six months. On December 1 lower freight rates on stoves were established from Louisville to Southern points, in compliance with the requests of Louisville manufacturers. Another movement is now on foot to secure the reduction of freight rates in Illinois, which have for a long time been higher than those prevailing in neighboring States, and have thereby operated as a discrimination against the local manufacturers in endeavoring to secure trade in their own State. These occurrences show the importance of the subject of railroad freight rates as a topic for permanent consideration by local stove associations as well as the national body.

Meetings of Associations.

The event of the year in gatherings of manufacturers was the twenty-third annual convention, which was held at the Auditorium Hotel, Chicago, on May 2 and 3. The occasion was one of the most interesting in the history of the National Association of Stove Manufacturers. An unusual number of exceedingly practical papers was read, and the discussions were animated and instructive. At this meeting it was resolved that current prices and terms on stoves should be firmly maintained during the year 1894, in the best interests of manufacturers, dealers and labor. The following officers were elected for the ensuing year:

President, George D. Dana, St. Louis.

First vice-president, Lazard Kahn, Hamilton, Ohio.

Second vice president, Francis Kernan, Utica, N. Y.

Treasurer, W. S. Stevenson, Philadelphia.

Secretary, D. M. Thomas, 80 Broadway, New York.

Board of Management, H. W. Buttorff, Nashville, Tenn.: Henry Cribben, Chicago; C. A. DuCharme, Detroit; Frederick Will, Rochester, N. Y., and W. E. Walker, Taunton, Mass.

The Stove Founders' National Defense Association held their annual meeting at the same place, on the day previous to the meeting of the National Association, and re-elected the old officers, headed by Henry Cribben of Chicago as president. Harmonious relations with workmen were reported, and the proceedings were consequently of a routine character.

A meeting of Southwestern Stove Manufacturers was held at the Southern Hotel, St. Louis, on August 20, and was attended by representatives of all the foundries of St. Louis, as well as many of those in Southern Indiana and as far south as Memphis, Tenn. Questions of important local interest were considered. Another meeting was held at the same place on November 7 and 9, which was even more numerously attended, and by manufacturers from a wider scope of territory. Steps were taken toward the formation of a Southwestern Association, to meet bi-monthly or quarterly, to regulate local matters and to act in harmony with the National Association.

At the Grand Hotel, Cincinnati, December 4 and 5, an important meeting was held which was attended by a considerable number of the most prominent stove manufacturers of the West and Southwest. Action was taken upon the proposed reclassification of stoves by railroads, and efforts were made to harmonize differences between Northwestern and Southwestern manufacturers, while prices were also discussed to some extent. Much business was put in shape for final consideration at the next annual convention of the National Association.

New Patterns and Designs.

Notwithstanding the general dullness in the stove trade, enterprise was not completely checked. Many manufacturers brought out new patterns with which to coax needed dollars from reluctant pockets. Popular constructions, which had been on the market for some time and had lost their novelty, were redressed in order to awaken fresh interest. Less was done in this way than in previous years of activity, but it is noteworthy that so much was done at a time when economies of all sorts were being enforced to reduce running expenses of manufacturing. Some classes of stoves, which had been previously made by a very few, were brought out by others in order to catch the rising breeze of public favor. Among these is the cast iron air tight stove for burning soft coal, which has been remarkably successful the past year, due very probably to the enforced economy prevailing among the general public, which has led in the West to the substitution of cheap soft coal for the much dearer anthracite, but compelled the use of a different type of stove. Sheet iron air tight stoves have also been brought out for wood, being further adapted to the use of chips, cobs, bark, &c., and therefore have met with a wide sale in many portions of the country, owing to their low first cost and their adaptability to cheap or refuse fuel. Phenomenal sales are reported of these sheet iron wood heaters. Great progress has also been made in the construction of stoves specially designed to burn straw and hay, and therefore in much favor on the treeless plains of the Northwest, which are also long distances from coal deposits. Greater success has also been attained in the construction of stoves for burning lignite, which is found so abundantly in some parts of the Rocky Mountain region, but cannot be burned to advantage in stoves of ordinary construction.

Improvements in Plant.

Considerable capital has been invested during the year in providing better manufacturing facilities, rebuilding burned foundries, enlarging warehouses, improving office accommodations, &c. Among the most important improvements of this character in the stove and allied trades are the following:

The Auburn Stove Foundry Company of Auburn, Maine, rebuilt their works, which were damaged by fire in 1893.

The Excelsior Steel Furnace Company of Chicago removed into much larger quarters at 38 and 40 West Monroe street, where they occupy a five-story and basement building in the manufacture and storage of furnace fittings, furnaces, boilers, &c.

The Bridge & Beach Manufacturing Company of St. Louis demolished their old foundry, which had been in use since 1848, and erected a seven-story building, extending from Main street to the levee. It is equipped throughout with the latest improved machinery of the most approved design.

The Glazier Oil Stove Company of Chelsea, Mich., built an important addition to their works.

The Michigan Vapor Stove Company of Grand Rapids, Mich., removed into a much larger building, to meet the requirements of their growing trade.

F. Meyer & Bro. Company of

Peoria, Ill., largely increased their capacity for manufacturing furnaces.

The Spicer Stove Company of Providence, R. I., made important additions to and changes in their foundry, adding greatly to the convenience of the plant as well as increasing their facilities for production.

The Warren Hardware Company of Warren, Ohio, erected a new building for the manufacture of steel ranges, enabling them to materially enlarge their output.

W. M. Crane & Co., 838 Broadway, New York, increased their facilities for the manufacture of hotel and restaurant cooking appliances.

The Detroit Stove Works completed one of the finest stove warehouses in the country at 2921 to 2929 La Salle street, Chicago.

The Coldwater Oil Stove Company, Coldwater, Mich., greatly enlarged and improved their plant.

The Front Rank Steel Furnace Company of St. Louis took possession of much larger quarters at 705 and 707 North Main street.

The William Miller Range & Furnace Company of Cincinnati erected a much larger building at Seventh street and Broadway, to accommodate their increasing business.

Cribben, Sexton & Co. of Chicago built a very fine office and warehouse at 52 to 56 Erie street, immediately adjoining their foundry, and removed their sales department to it from Lake street, where they had been for 20 years.

The Hood Furnace & Supply Company of Corning, N. Y., rebuilt their plant for the third time in their history, greatly enlarging their facilities, which are exclusively employed in the manufacture of warm air furnaces.

The Thomas White Stove Company of Quincy, Ill., added a five-story brick building to their works, to be used as a mounting shop and for storage.

The Channon-Emery Stove Company of Quincy, Ill., built a brick boiler and engine house and a four-story brick building to be used for cleaning, mounting and trimming. They also put in a new nickeling plant.

Rathbone, Sard & Co. of Aurora, Ill., erected a large addition to their already immense warehouse, greatly increasing their facilities for making prompt shipments of stoves during the busy season.

The Rock Island Stove Company of Rock Island, Ill., put up a model office building, two stories in hight, of red brick with stone trimmings, the ground floor to be used as a sample room.

Floyd, Wells & Co. of Royersford, Pa., made extensive improvements in their foundry.

The Favorite Stove & Range Company of Piqua, Ohio, added a great deal of new machinery to their equipment.

The Lexington Foundry Company of Lexington, Ky., erected a large wareroom building for storing patterns, &c.

The Thatcher Furnace Company of New York removed to a much larger warehouse and salesroom at 240 Water street and made numerous improvements in their plant at Newark, N. J.

The Ireland & Matthews Manufacturing Company of Detroit, Mich., have erected an additional three-story building for the purpose of increasing their manufacturing facilities, being large makers of stove trimmings and ornaments.

New Companies.

Among the new establishments launched this year in the stove trade or kindred lines are the following: The Ferrosteel Company of Cleveland and Chagrin Falls, Ohio; the Evansville Stove Works of Evansville, Ind.; the Rapid Transit Stove and Furnace Company of Baltimore, Md.; Cole & Cole of Omaha, Neb.; the Standard Range Company of Evansville, Ind.; the Cincinnati Steel Range Company of Cincinnati, Ohio; the Mobile Stove and Novelty Works of Mobile, Ala.; L. G. Comparet of Des Moines, Iowa; the Schaab Puff Stove Company of St. Louis; the Home Stove Company of Indianapolis, Ind.; the Beaver Falls Heating and Ventilating Company of Beaver Falls, Pa.; the Detroit Galvanizing and Sheet Metal Works of Detroit, Mich., as makers of sheet iron stoves; the Simmons Hardware Company of St. Louis, as makers of sheet iron stoves; the Hagey Stove Company of St. Louis; Ferris & Sons of St. Louis; A. Ohnemus & Bro. of Quincy, Ill.; the Manchester Stove Company of Manchester, Ohio; the Bly Gas Burner Company of Sioux City, Iowa; the Queen Stove Company of Denver, Col.; the Economy Gas Stove Company of Decatur, Ill.; the Marion Heating Company of Marion, Iowa; the Plymouth Stove Company of Boston, Mass.; the Western Stove & Manufacturing Company of Milwaukee, Wis.; the Dayton Manufacturing Company of Dayton, Ohio; the Chicago Gas Stove Manufacturing Company of Chicago; Moore Brothers of Wichita, Kan.; the Conover Fire Place Manufacturing Company of New York; the St. Louis Gas Radiator Company of St. Louis; the Ryns Hot Air Heating Company of Kansas City, Kan.; the Galusha Stove Company of Rochester, N. Y.; the Lansing Co-operative Stove, Furnace & Fuel Company of East Lansing, Mich.; the Albany Facing Mill Company of Albany, N. Y.; the Eclipse Stove Company of Rockford, Ill.

Business Changes.

Head's Iron Foundry of Utica, N. Y., was succeeded by Giblin & Co.

The Security Gas & Vapor Stove Company of St. Louis were succeeded by L. B. Jones as manufacturer of the Security gas stove.

The business of E. D. Ransom & Co. of Albany, N. Y., manufacturers of foundry facings and supplies, was sold to the Albany Facing Mill Company.

The A. C. Barler Mfg. Company succeeded the Huette-Barler Mfg. Company of Chicago, makers of Barler's Ideal oil heater.

The Bridgeport Stove Works Company succeeded Lowman Brothers of Bridgeport, Ala.

Bramhall, Dean & Co. of Chicago were succeeded by Dean, Huot, Brooks & Moneuse Company.

The Bain Stove Company of Charleston, Ill., failed.

The Central Stove Works were incorporated at Lebanon, Pa., to succeed Forster Brothers.

E Bement & Sons of Lansing, Mich., purchased the business of the Wilcox Heat Light Company of Grand Rapids, Mich.

The Bennett & Peck Heating & Ventilating Company of Cincinnati changed their name to the Peck-Williamson Heating & Ventilating Company.

The Rogers Stove & Foundry Company of Belleville, Ill., failed.

The Simonds Mfg. Company of New York passed into a receiver's hands.

The business of the Baxter Stove Company of Mansfield, Ohio, was divided, the Monarch vapor and gas stoves passing under the control of the Monarch Gas & Vapor Stove Company.

The Raymond & Campbell Mfg. Company of Middletown, Pa., passed into receivers' hands.

The Chicago Stove & Range Company bought the stock and business of the Chicago branch of the Sill Stove Works.

Fires.

On February 10 the works of E. Bement & Sons, at Lansing, Mich., were damaged to the extent of about $10,000; on the 18th the Glazier Stove Company of Chelsea, Mich., lost their warehouse and offices; on the 19th Hess, Snyder & Co. of Massillon, Ohio, lost their pattern storehouse; on the 25th the works of the Bloomington Stove Company of Bloomington, Ill., were practically destroyed; on April 5 the Baxter Stove Company of Mansfield, Ohio, suffered the loss of their storage warehouse; on May 28 the Kibler Stove Works of Denver, Col., lost a portion of their patterns; in June the foundry and pattern shop of Bridgeford & Co. of Louisville, Ky., were destroyed; on July 2 the large warehouse of Stratton & Terstegge of Louisville, Ky., was burned; on July 8 the factory of the Quick Meal Stove Company, at St. Louis, was partially destroyed; on September 1 the foundry of Cribben, Sexton & Co. of Chicago was slightly damaged; on September 3 the Van Wie Gas Stove Works, at Rockford, Ill., were completely burned; in the same month the works of the Memphi Stove Company of Atlanta, Ga., were partially burned; on Sep-

tember 25 the foundry of the Gladiator Stove Works, at Russell, Ky., was destroyed; in October the Cleveland Foundry Company of Cleveland, Ohio, were burned out, the plant being leased from the Cleveland Co-operative Stove Company; in November the foundry of George Harbly & Sons, at Russell, Ky., was destroyed.

A Few Items of Interest.

The Anshutz Bradberry Company of Pittsburgh celebrated in 1894 the fiftieth anniversary of the establishment of their business. In 1792 the first blast furnace west of the Alleghany Mountains was erected at Pittsburgh by George Anshutz, an uncle of the founder of the firm. The name is thus indelibly connected with the iron history of the famous Iron City.

In April the Sharon Stove Works of Sharon, Pa., delivered a stove to a customer in six hours from the time the pig iron was melted for it in the foundry cupola.

George H. Barbour of the Michigan Stove Company, Detroit, will be long remembered by the poor of that city for his indefatigable work in the winter of 1893-94 in relieving their necessities.

B. W. Dodson, for years permanently identified with the stove business, retired from it in 1894. He was last connected with the Detroit Stove Works as second-vice-president in charge of their Chicago branch.

John Keyser, a veteran stove manufacturer of New York, retired from business July 1, having spent 55 years of his life as a manufacturer of stoves and furnaces and an inventor.

The Indiana Stove Works of Evansville, Ind., put in force a plan for the benefit of their regular employees in case of sickness or accident. The sum of $1000 was set aside for this purpose, to be drawn upon under certain stipulations, married men to receive $5 per week, unmarried men $3 and apprentices $2.

Deaths.

The death roll for 1894 includes a number of prominent names. In January George W. Gardner, manufacturer and inventor, died at Troy, N. Y.; Robert White, an old employee of Rathbone, Sard & Co., died at Utica, N. Y. In March George H. Pickering, a veteran traveler in the employ of the Spicer Stove Company, died at Providence, R. I.; Samuel Freeman, long connected with the Magee Furnace Company, died at Boston. In April Anson Ingraham, for years a stove manufacturer at Troy, died at Center Cambridge, N. Y. In June William W. Corner, who had also been a manufacturer at Troy, died at Poughkeepsie, N. Y.; B. C. Bibb, president of the B. C. Bibb Stove Company of Baltimore, Md., died at Baltimore. In August Frank F. Proctor, secretary of the Culter & Proctor Stove Company, died at Peoria, Ill.; Jesse Reynolds, senior partner of J. Reynolds & Son, died at Philadelphia. In September Amos C. Barstow, president of the Barstow Stove Company, died at Providence, R. I.; Benjamin Carver of the Grander Stove Works, died at Royersford, Pa.; Charles F. Whiting, long in the stove trade and latterly a salesman for Eugene Munsell & Co., died at Orange, N. J. In October Will Stork, a well known stove salesman in the employ of the Portsmouth Stove and Range Company, died at Portsmouth, Ohio. In November Robert Diven, one of the oldest stove men in New York, and for nearly forty years connected with the J. L. Mott Iron Works, died in New York; James B. Taylor, long a confidential employee of the Richardson & Boynton Company, dled in Brooklyn. In Decemben Norman H. Galusha, long a prominent manufacturer, died at Rochester, N. Y.; J. Emery Eaton, for a number of yesrs president of the Syracuse Stove Company, died in New York.

Opinions from the Trade.

As the new year opens and the accounts for the past 12 months are closed, the members of the trade naturally turn their thoughts to the outlook for the future. As conditions are not the same in all sections, it is not surprising that there is a diversity of opinion in the trade as to the volume of business likely to be transacted during 1895. In the light of the reports from stove manufacturers of the country it appears that the majority consider the outlook for business during the next few months as far from encouraging, although an improvement is regarded likely in the near future. In those sections where the crops have been poor or practically a total failure, thus seriously reducing the purchasing power of consumers, a poor business is expected until the fall, when trade will be better than for the corresponding period of last year. In other sections the outlook for spring trade is said to be better than a year ago, but it does not seem likely that prices will show any advance. There are a few who consider the prospect for the new year fairly good, and although at the moment there is very little on which they can intelligently base a forecast, they express a hope of better times before long.

A manufacturer in the Eastern section of the country writes that, "based upon the state of trade the past few months and the reports from the traveling men, the prospects are not encouraging, and we shall be slow to make up stock." Another concern, who take a little more hopeful view of the situation, write as follows: "Prospects are good for 1895 business, but prices will be low. We are inclined to think that the results of the year's business, so far as profits are concerned, will be unsatisfactory." An enterprising manufacturer in one of the central Western States expresses the following opinion: "I believe, as the tariff agitation is practically over, confidence has been restored to such an extent that we look for a marked improvement in 1895 as compared with 1893 and 1894." A leading manufacturer in heating specialties in the neighborhood of Chicago, in writing of the prospects of the coming year, says: "They are much better than a year ago. Then every one was discouraged, while now a general feeling of hopefulness prevails which, in itself, is an indication that business will be better. The low prices of building materials should serve to stimulate building, and thus lead to a larger demand for goods." A manufacturing concern located in one of the large wheat and corn growing States say that there is not much ahead to encourage them, "as the drought stricken districts will not be in a position to do much business in 1895, and this, we feel, will cut quite a figure in the volume of trade."

A concern located in one of the leading cities of the South state that they expect to do a light business for at least the first six months of the year, but after August 1 they look for better times. Another firm located in one of the States bordering the Mississippi River write as follows:

"The prospects for the coming year are not encouraging, so far as this section is concerned. The low price of cotton has hurt trade and delayed collections, and as the acreage of cotton has increased to such an extent we see no prospects for the price of cotton being much higher next year. There is some talk among Southern farmers of turning their attention to other crops and decreasing the acreage of cotton, with a view to raising the price. We believe this is the best solution of the difficulty —raising less cotton and buying less corn and pork from the West."

An Ohio manufacturer, who considers the prospects for the new year as fair, states that the open winter has kept dealers from buying, and as soon as trade brightens he believes there will be a fair volume of business in the stove line. Another concern in an adjoining State do not look for a very prosperous year, owing to the low prices of cotton and wheat, through which the purchasing power of the farmer is much reduced, and in addition to that retailers are said to be carrying large stocks of heating stoves. The opinion of manufacturers in the Northwest seems to be of about the same nature as some of the manufacturers of the South. A leading concern, writing with regard to the prospects for the coming year, say:

"We do not look for any great improvement. The farmers of the Northwest cannot raise crops with a profit. We are almost wholly dependent on the products of the soil yielding a good return, and until they do we cannot look

for an appreciable gain in the volume of trade."

The conditions which have prevailed in manufacturing circles during the past year have of course exerted a greater or lesser influence upon the working classes, to whom the trade looks for the consumption of its product. The financial strength of the purchasing classes in the Western stove trade is reported by some to be less than it was a year ago. One explanation of this is given by a leading stove manufacturing concern in the Northwest, who say:

"The farmers cannot raise wheat at 40 cents a bushel and get back the first cost. Wheat has heretofore been the staple product of the Northwest, and when farmers could get from 75 cents to $1 a bushel at the railroad stations they could make money. They must now turn their attention to more diversified farming, and it will take a little time for matters to adjust themselves. Meanwhile they will, of necessity, be compelled to restrict their purchases to the essentials."

A Pennsylvania manufacturer, referring to the financial strength of his customers, does not consider that it is more than one-half of what it was in the year 1892. This may be an extreme view, and in contrast to it is the report of a manufacturer in Indiana, who writes that, notwithstanding the hard times and the unusually low price of products, "more people have discounted their bills than ever known before." Still another writes that a closer examination of credits has had the effect of driving the "little fellows" out of business. They state that they lost less last year, in proportion to the business done, than in any previous year. Other manufacturers consider that there has been no change in the financial strength of their customers, while still others state that collections have been better than expected, customers having paid their bills promptly, while the tendency seems to have been to get nearer a cash basis.

Miscellaneous.

The conditions which have existed during the past year have had a tendency to stimulate to some extent the trade in stove repairs, for when, under ordinary circumstances, a new stove would be purchased to replace one nearly worn out, the consumer has bought repairs and made the old range or heater serve for another winter.

While, therefore, it may be stated that competition has been sharp and profits small, the volume of business transacted by the concerns engaged in the repair trade has been of a satisfactory character, and there is an encouraging outlook for the new year. Manufacturers of fire brick report a trifle less satisfactory trade last year than the 12 months preceding, and while some consider the outlook unfavorable, others regard it as good.

The unsatisfactory business in the stove trade was reflected in that of stove ornaments and trimmings, where competition was very sharp and profits smaller than the year before. The outlook, however, is regarded as much brighter than it was a year ago, and, while no "boom" is expected, a good trade is counted upon during the next 12 months.

Some of the pattern makers report the demand for patterns for castings about equal to some of the previous years, with somewhat less competition and a smaller margin of profit. The outlook for 1895 is considered good.

The Vapor Stove Trade in 1894.

To ascertain the general condition of the gasoline stove trade for the year 1894, a correspondent of *The Metal Worker* interviewed Charles A. Stockstrom, president of the Ringen Stove Company and Quick Meal Stove Company, St. Louis, Mo., with the following result:

How does the output of 1894 compare with 1893?

The total output of vapor stoves for 1894 is calculated to be about 20 per cent. below that of 1893, which would seem to compare favorably with the average decrease in the output of manufactured merchandise during that period. It should be remembered that the full force of the general depression was not felt by the retail trade to any extent until about July 1, 1893, when the jobbing business was virtually over. Of course what little might have been done during the balance of the season was absolutely cut off, but that did not materially influence the manufacturers' trade, though it had the effect of leaving a stock on the hands of those dealers who had bought liberally, and so found quite a number of them with stocks to be carried over to the season of 1894, thereby helping further to reduce the output during that year. The decline in the number of stoves sold was probably not more than 20 per cent., but in dollars and cents it was very nearly 30 per cent., for the reason that there was quite a material difference in the percentage of the kinds of stoves sold during that period, inasmuch as the junior or small and cheapest kind gained in percentage, while the evaporating stove or higher priced goods lost in proportion—all as a natural consequence of hard times. Dealers have bought very sparingly during 1894, and as a consequence light stocks are reported as a rule, except in sections of the country where bad crops did not enable them to even dispose of the goods sparingly bought.

Do you consider the evaporating stove a fixture on the market, or will it be supplanted by the generator stove?

There is no doubt now that the evaporating stove has come to stay. It has now been on the market for five seasons, and while somewhat crude at first, like all new things, has been so improved that at this present stage it might well be considered perfect. It has entirely superseded the generator stove, of which kind probably not over 1000 have been sold during the past year. Even in the junior stoves the generator principle has been discarded and hardly any of them are made except with individual burners. Dealers in gasoline stoves in late years, and more so during the last year, have become extremely conservative as far as changing their lines of gasoline stoves is concerned. Perhaps there is not an article made in the construction of which the manufacturer is so liable to err as in gasoline stoves. The most insignificant appearing little thing often makes a stove, which is otherwise correctly constructed, a failure, and the worst of it is that these defects only develop with time, some in a week or month, others in a year or still longer. Only extremely careful, long continued tests, and more especially long years of experience and a thorough knowledge of every part and its action, are absolutely necessary to successfully avoid mistakes. In former years a good many dealers would think nothing of changing their line annually for three or five seasons in succession, but now so many of them have had to pay dearly for their experience that they are not so anxious to take hold of stoves with new experimental features; in fact, they rely, as they should, to a great extent upon the good, careful judgment of the manufacturers whose goods have been handled successfully before. Such is certainly for the better interests of both dealers and manufacturers.

Has the dealer studied the construction of gasoline stoves, or does he sell them without knowing practically anything regarding their construction, &c.?

The dealer recognizes that to be successful it is absolutely necessary to be fully conversant with the detail construction of the stove, so as to be able to remedy any little trouble which may arise when the stove is in use. Failure to operate satisfactorily in gasoline stoves is generally caused by some little thing which is very easily adjusted when the construction of the various parts and the principle upon which these parts operate is thoroughly understood. Some dealers, it is true, do not want to take the trouble to learn anything about the gasoline stove. As a consequence, of course, they have lots of trouble, become disgusted with gasoline stoves in general, and finally quit the line entirely, blaming the manufacturers and their customers for all their trouble, when the blame lies entirely with them.

How do the prices of 1894 compare with previous years?

There has been virtually no change in 1894 in the price of vapor stoves to the trade, with the exception of a decline in the second grade juniors. Material was cheaper than in the previous year, though wages, which constitute more than 50 per cent. of the stove's value, have remained about the same. The stoves throughout, however, are a great deal better than they were in 1893.

Is the production of gasoline stoves much in excess of the demand?

Competition has been extremely keen, since the demand for stoves has not kept pace with the ever growing capacity of manufacturers to turn out goods, so that to-day the manufacturing capacity certainly exceeds the demand by from 50 to 75 per cent. As a consequence, manufacturers are exerting themselves to offer the best on the market.

Are the evaporating stoves turned out to-day as well made as in previous years?

Materials which go to make up the

stove have during the last year been used in heavier gauges, and of better quality than before. When useful, metals of higher grade have been substituted for iron and tin, the greatest care has been used in making all working parts perfect, and as far as outside appearance is concerned there is hardly a stove that has not been greatly beautified. To judge from present indications this policy on the part of every manufacturer, to make his line absolutely perfect and the best on the market, and so retain his hold upon the trade, will, it seems, be adhered to for the coming season. The cost of these various improvements to the manufacturers has been greatly counterbalanced by the decline in the material, but the stoves have been so much improved in safety, durability and freedom from defects, and liability to become temporarily useless, that as an article of merit before the public the evaporating stove never occupied a higher position.

What position do the Junior stoves with individual burners hold in comparison with the evaporator stoves?

Junior individual burner stoves have hardly kept pace with the evaporator. It is true the peculiar line Junior has been made much better and much safer, but on the other hand a second grade Junior has sprung up, in which, on account of the extremely low price at which it is being offered, it is impossible to embody the desirable features which make a first-class Junior as perfect in their way as the full-sized stoves. The user must necessarily be disappointed, and therefore this class of stoves, while generally considered doing missionary work toward the introduction of the evaporating stove, must rather be considered hurtful to the gasoline stove interests in general.

Vapor Stove Consolidation

A history of the year would not be complete without some reference to the efforts made last summer to consolidate the vapor and gas stove interests of the country under the management of the United Vapor & Gas Stove Company. This concern were incorporated under the laws of the State of Illinois, early in June of last year, with a capital stock of $8,500,000. The negotiations, which were in the hands of Emerson McMillin & Co. of New York, continued for a long time, and had to do with the leading manufacturers of gas and vapor stoves in Cleveland, Chicago and St. Louis. The movement made progress, and there were strong indications at one time that the object sought would be attained. Difficulties arose, however, which were not easily overcome, and the matter drifted along for many months until interest in the movement finally ceased.

The Lehigh Stove & Mfg. Company of Lehighton, Pa., have issued for the new year a very neat card calendar. The uppor portion is embellished with a landscape, in water colors, by Noakes. This is surrounded with ornamental typographical features printed in old gold and red. Attached to the lower portion of the card are the leaflets, carrying a monthly and yearly calendar.

Gas Stoves and Appliances

An increased business in gas stoves and appliances has been reported for the past year, but owing to a number of peculiar conditions the trade has been by no means satisfactory. Gas as a fuel has made a very favorable impression upon the people, and manufacturers made preparations for doing a large trade. Some of the goods were in the hands of the dealers before the full effect of the depression throughout the country was generally understood. Some eagerness was displayed later to get rid of the large stocks which had been manufactured, and as a result new fields were sought and the competition in selling reduced the profits far below a satisfactory figure. Another feature in the retail competition is the sale of these goods by gas companies, who in the desire to increase the consumption of gas either send out the stoves at a small rental or sell them on the installment plan, or at practically cost for cash, much to the disadvantage of the dealer. Some rash claims have been made by enthusiastic dealers in gas goods, and as a result too much has been expected in some quarters from gas stoves. While gas is generally reported as economical for cooking, it may safely be said that the public is not altogether satisfied with the economy of gas for heating.

Some very handsome goods have been placed on the market in both cooking and heating apparatus, the burners being invariably of the atmospheric type. In the construction of burners the object sought is to prevent firing back rather than to secure a perfect combustion or economy. It is claimed in some quarters, and particularly in reference to the cheaper and simpler goods, that there has been wholesale piracy. The effect of this was felt at the hight of the season in the low prices quoted on hot plates. Some of the demoralization in prices has been due to the handling of these goods by department stores, where price rather than quality is made the attraction.

New Goods.

During the year hot air furnaces to use gas as a fuel have made their appearance, and a few have been installed for testing this winter. A specially constructed hot water apparatus for the heating of houses has also been placed on the market. Both of these are intended for the use of artificial gas. Some new devices have been produced for attaching to the water service pipes of a building, for supplying hot water for both domestic and bathing purposes, and some others are reported as being ready for introduction as soon as the condition of the market will warrant it. There is a marked increase in the use of gas in hotel and restaurant kitchens. In this field, it is claimed, the demand is for reliable goods, and there is not so much difficulty experienced in securing fair prices for good appliances.

The Proposed Stove Reclassification.

Representatives of the Western railroad companies met in Chicago week before last to consider the reclassification of stoves. The meeting had been specially called for that purpose, in view of the numerous protests which had poured into the offices of almost every railroad company. It was decided to permit the old classification to stand until the next regular meeting of the Western Classification Committee, which will be held in July, 1895. This is an important victory for the stove manufacturers of the Central West, who recognized the movement to advance stove freights by classifying them at a higher rate as a serious menace to their trade. Just at this time any advance in cost is not willingly borne by either dealers or consumers, and the change proposed would have formed a very considerable additional item of expense to them. The manufacturers are to be congratulated on the persistent contest which they inaugurated as soon as the new classification was promulgated, and which did not cease until the railroad companies had announced their change of heart. Without detracting from the good work done by others, credit seems to be specially due to Messrs. Wm. H. Sard, Frederic W. Gardner and William H. Cribben, all of Chicago, who were unceasingly at work and ingeniously effective in bringing to bear the most persuasive influences.

ODD PLATES.

The Matthews Northrup Company of Buffalo, N. Y., are continuing for 1895 their Vest Pocket Daily Reminder, which has proved itself such an invaluable companion for business men. Their orders last year were much in excess of those of any previous year. They are bringing out 13 styles for 1895.

The Brand Stove Company of Milwaukee, Wis., favor us with one of their calendars for 1895. It is a very pretty wall calendar, composed of a heavy white card, across the top of which is printed a pleasing picture, while below are attached leaves for the months.

Rathbone, Sard & Co. now have on their sample floor at Randolph street and Wabash avenue, Chicago, a full line of their steel Acorn ranges. Hitherto they have been unable to keep up with the demand so as to properly show samples. They have six sizes in this line, with all varieties of pipe shelves and high closets, bracket reservoirs, water fronts, wood fixtures, &c. In the construction of these ranges they have aimed to furnish a steel range at moderate price, so as to sell by the side of first class cast ranges. They further adopted regular sizes of ovens—18, 20 and 22 inches—suited to regular sized baking tins, roasting pans, &c. Other important and valuable features are found in these ranges. The bracket reservoirs can be attached to any sized range in a few minutes, so that a dealer is not compelled to carry a large stock of reservoir. They are further heated by pipe connections, so that the reservoir can be used with the water front, to furnish large quantities of hot water. All have duplex grates. Fire chamber fixtures are interchangeable among all sizes. When arranged for wood the fire chamber has a swing door to take in large pieces, while the coal ranges have a chute door. These ranges are exceed-

UNIVERSITY OF ILLINOIS LIBRARY

ingly showy, having nickel pilasters on the front corners, nickel trade-mark panel on the oven door, massive towel racks, nickel uprights to high shelves, and nickel frames to all doors.

Bergstrom Bros. & Co. of Neenah, Wis., have issued a remarkably fine calendar. The leaves for the months are large, permitting the use of large figures, easily read at a distance, and printed in two shades of green. The leaves are fastened to a larger card bearing the firm's name in gilt and crimson lettering, together with their trade-mark.

A dainty little calendar, notable for its delicate coloring, is being distributed by the Magee Furnace Company of Boston. The pretty youngster whose portrait decorates the card suggests sunshine and summer weather and smiles of welcome to all who interest themselves in the Magee furnaces and ranges. An attractive feature of the calendar is the unobtrusive style in which the advertisement of the company appears.

The Portland Stove Foundry Company, Portland, Maine, are distributing with the compliments of the season an exceedingly neat folder of a size convenient to carry in the vest pocket. The cover is embellished with a colored picture showing three little children, while down in one corner are the figures 1895. The inside pages of the folder are taken up with a calendar printed in old gold upon a white ground. Below the calendar is brief reference to the Atlantic stoves made by the company.

A very neat calendar for the new year reaches us within the compliments of the Presbrey Stove Lining Company, 212 Somerset street, Taunton, Mass. The upper portion of the card is taken up with a representation of a young body driving a "Jersey Family" to the brook to drink. On the opposite side of the brook in a crouching attitude is a dog, who has every appearance of being in a great fear of his Jersey neighbors. Below the picture is the name and address of the company and further down on the card is a calendar proper. The sheets forming this differ from the general run of calendars in that they have at the right a number of blank spaces for the purposes of memoranda. The card is neatly gotten up and is arranged with a white cord for the purpose of hanging it upon the wall.

The Richardson & Boynton Company have closed their works in Brooklyn for the usual stock taking and inventory incident to the end of the year.

Rathbone, Sard & Co. of Chicago and Aurora, Ill.; Albany, N. Y., and Detroit, Mich., will make this year the Magnet Acorn range for hard coal with a fire box at the right hand, to meet the frequent calls for a construction of this character. The range will also be made of the usual pattern, with the fire box at the left hand. The Acorn pocket calendars for 1895 are being distributed. They are of the same shape and design, with revolving leaflets, as in previous years, and the demand for them, instead of falling off, constantly increases.

One of the handsomest novelties of the season to reach us thus far is that presented with the compliments of the Highland Foundry Company of Boston, Mass. It consists of two pieces of cardboard arranged in the shape of a folder, the front of the cover being embellished with a beautiful winter scene printed in colors and having all the effects of snow and ice. The picture has a frame of rustic design and depending from the twigs and leaves are long icicles and bunches of snow. Opening the folder there is revealed a winter scene that is difficult to describe. In the foreground are boys and girls amusing themselves sliding and skating, while beyond are two people in a sleigh drawn by a spirited horse, the whole presenting a very lifelike appearance. Still further in the background and at the left is a Swiss cottage, burdened with snow and ice. On the hill at the right are other buildings, the deep background showing a winding valley with the mountains covered with snow and ice, the color effects being such as to produce a charming picture. The entire make-up is such as to render the New Year's souvenir entirely unique in its way and entitle it to a prominent place in the home, for it is too handsome and artistic to be left about the office or shop. Accompanying the above is a cardboard likeness of a young maiden attired in white dress, red hat and shawl, and carrying in her hand a fan, upon which is the inscription "Highland Foundry Company, Boston, Mass." Attached to the base upon which she stands are 12 lesflets carrying a calendar for the days of the week and month, together with the phases of the moon. This unique little calendar is so made as to be used as an easel on the desk.

The Buck's Stove & Range Company of St. Louis, Mo., are distributing, with their compliments, a pocket memorandum book bound in leatherette and carrying upon the inside pages of the cover yearly calendars for 1895–96. There are several pages ruled for addresses, following which are census figures covering the principal cities of the United States and of the world, together with rates of domestic postage. Each page is divided into seven spaces, there being one for each day of the week. At the outer edge of the page is printed the day of the week and month and also the number of the day in the year. At the close are numerous pages for cash items. In the center of the little book, which is a calendar, diary and memorandum combined, we find some remarks relative to Buck's stoves, ranges and heaters.

The Anshutz-Bradberry Company, proprietors of the Tremont Stove Works, Allegheny, Pa., are sending out a very neat calendar for the new year. The upper portion of the card is printed in a delicate shade of blue, giving a bird's-eye view of the works of Henry Anshutz as they appeared in 1844 and of the present establishment. There is also a *fac simile* of the company's trademark and their long distance telephone number. There are 12 leaves for the months, while a thirteenth sheet carries a yearly calendar.

The stove mounters of Albany have been recently organized into a union affiliated with the Stove Mounters' International Union. It is said that nearly all the stove mounters in the city were enrolled.

Moore Brothers, stove founders, who occupied, a short time ago, the old Stewart Brothers' plant in Wichita, Kan., have already found their quarters too small to properly handle the business which they have built up, and they have decided to abandon their present quarters and erect a new plant. On December 22 they closed a five-years' lease for a plot at the corner of First street and Fifth avenue, which gives them about 150 feet frontage on the Atchison, Topeka & Santa Fé Railroad, with a depth of 225 feet. The firm will at once commence the erection of buildings of suitable size to accommodate their business.

Hess, Snyder & Co. of Massillon, Ohio, favor us with a copy of the 1895 calendar which they are distributing to their friends in the trade. Accompanying the calendar is a letter stating that the company will consider it a special favor if it is hung in a conspicuous place where it will serve as a standing reminder of the goods which they manufacture. The calendar is in the form of a large poster, bound with metal strips and embellished with a representation of a painting by Despartes entitled "Royal Setters. Time of Louis XIV of France." Beneath the picture is the name and address of the company with an indication of the lines of goods manufactured. The 12 sheets constituting the calendar proper are printed in clear black letters and figures, so that they are readily recognized at a distance. The company carry a large stock of goods on hand, and are in a position to promptly handle all orders with which they may be entrusted.

The Eclipse Stove Company of Rockford, Ill., notice of the incorporation of which appeared in a recent edition, are the outgrowth of the old Van Wie Stove Company, and will occupy what is known as the Knowlton plant.

The Keeley Stove Company of Columbia, Pa., shut down on December 20 for the purpose of taking account of stock.

The Marshall Furnace Company, Marshall, Mich., are, we understand, looking about for more commodious quarters, which will enable them to handle their growing business to better advantage. A representative of the company was in Jackson looking at several sites, but up to latest advices no decision has been reached.

We have received from the Co-operative Foundry Company, Rochester, a copy of the handsome calendar which they have issued for 1895. The groundwork consists of a card measuring 11 x 14 inches, across the top of which, in script letters, is the name and address of the company printed in old gold. A *fac-simile* of the company's trade-mark appears in the same color. The sheets carrying the calendar proper are 9 inches square, and are cut to closely resemble a Greek cross. The printing is in white, in clear cut type, upon reddish brown paper, forming a sharp contrast, and enabling the figures to be clearly seen at a distance. The leaves forming the calendar proper are mounted upon a black groundwork, the entire make-up being rich and effective.

The works of F. & L. Kahn & Bros. of Hamilton, Ohio, closed on Saturday, December 22, for two weeks, during which time the usual inventory will be taken and necessary repairs made.

The Star Coupler Company, St. Louis, Mo., who manufacture the Star coupler for connecting lead to lead pipe and lead to iron pipe, report a heavy increase in the demand for these goods. Dealers who ordered sample lots are now sending in orders for full stocks, and the works of this company are taxed to meet the demand. They are shipping large quantities to stove dealers for connecting water backs to boilers.

LAST WEEK the traveling salesmen of the Favorite Stove & Range Company of Piqua, Ohio, rendezvoused at the Plaza for the holidays. According to a local paper they commenced arriving Christmas night and the last of them put in an appearance Wednesday noon. The list included Tom Clemons of Cincinnati, Ohio; W. P. Sanders of St. Joseph, Mo.; W. H. Pier of Flint, Mich.; W. L. Miller of Chicago, Ill.; J. C. Frame of Indianapolis, Ind.; W. H. Lautzenheiser of Maumee, Ohio; J. C. Taylor of Newport, Ky.; J. E. Schroyer of Indianapolis, Ind., and C. Winkelman of Piqua. They had as their guest Daniel Holden of Bloomington, Ill., Superintendent P. G. Van Wie of the Gas Appliance Department of the company was also a member of the party. The company remained over Sunday, December 30, when they departed for the various sections of the country which they cover in the interest of the company's goods.

B. C. BAXTER, General Manager of the Monarch Stove Company, Mansfield, Ohio, left on the 28th of December for an extended trip through the West and Northwest, for the purpose of establishing distributing agencies in the principal cities of that section, including Chicago, St. Paul, Omaha, St. Joseph, Lincoln and Kansas City.

N. S. KNIGHT has recently severed his connection with the Fuller & Warren Company, Troy, N. Y., and will in the near future call upon his friends in the trade in the interests of the Howe ventilating stoves, made by the Cortland Howe Ventilating Stove Company, Cortland, N. Y.

A RECENT ADDITION to the staff of traveling salesmen of the Monarch Stove Company of Mansfield, Ohio, is H. H. Sanford, who will represent the concern named in the State of Iowa. Mr. Sanford has had many years' experience as a stove salesman, he having represented the Chicago & Erie Stove Company for the past 12 years. In the future, however, he will devote his energies exclusively to the interests of the Monarch goods in the territory named.

THE INSURANCE STOVE & OIL COMPANY have been incorporated at Cincinnati, Ohio, by Herman H. Uckotter, A. J. English, William Uckotter, George Uckotter and Charles A. Alborn, for the purpose of manufacturing and dealing in vapor stoves, together with other machines and devices, and also for the purpose of dealing in oil, with a capital stock of $10,000.

G. T. TRAIN, Memphis, Tenn., has purchased the interest of N. A. Kendall in the Memphis Stove Repair Company.

AT THE ANNUAL MEETING of the Quick Meal Stove Company, St. Louis, the following were elected its officers: President, Charles A. Stockstrom; secretary and general manager, Louis Stockstrom.

VOELKEL & SCHULTZ, Shelby, Texas, have succeeded Ernest Voelkel in the stove and hardware business.

AT THE RECENT ELECTION held by the Ringen Stove Company, St. Louis, the following officers were elected: Chas. A. Stockstrom, president; E. H. Stockstrom, secretary and treasurer. Geo. Kahle, who has been president of the Ringen Stove Company for some years, virtually retired from active business two years since, but still continued to hold the position of president. Deciding to make his home in Dresden, Germany, he has relinquished the presidency and, as above stated, Chas. A. Stockstrom has been elected in his place.

FRANK TULLY, formerly with the Boynton Furnace Company, Chicago, will change his address to 79 Lake street, where he will have charge of the heating department of Geo. L. Rood.

THE KERNAN FURNACE COMPANY will be represented in Chicago by Kernan & Sweeney, 71 West Washington street. The above firm are composed of Joseph F. Kernan and Charles A. Sweeney, who will handle the Chicago and Western trade and will carry a full line of Kernan furnaces.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

B. D. DUGGAN, 207 209 Lake street, Chicago, is to install a No. 424 Richmond steam heater in the residence of of Mrs. C. Claflins, Oak Park, Ill.

KEHM BROS. & MERTZ, 289 East Kinzie street, Chicago, have the contract for steam heating in the two four-story store and flat buildings of Gerhardt Roth, Cleveland avenue and Menominee street.

PURVIS & BROCKWAY, 215 Fifth avenue, Chicago, are to install a hot water heating plant in the residence of J. S. Brockway, Western Springs, Ill.

JACOB G. WEBBER, 244 North Clark street, Chicago, has contracts for the plumbing, gas fitting and sewerage in the following residences: G. O. Gottman, Baldwin street and Wilson avenue; J. L. Cochran, 41 Kenmore avenue; E. N. Higgins, Edgewater.

THE REQUEST made by T. Fornoff at the last meeting of the City Council of Union Hill, N. J., to be allowed to withdraw his bid for placing steam heating apparatus in the fire houses in the Town Hall was granted, and the contract was awarded to the next lowest bidders, Knack & Son.

J. F. BRADY & BRO., Bridgeport, Conn., have the contract for the plumbing in the new house of P. Burns.

THE AMERICAN DISTRICT STEAM COMPANY of Lockport, N. Y., have secured a contract for a steam heating plant at Terre Haute, Ind., for the Terre Haute Electric Light & Railway Company. They also secured a contract for a plant at St. Joseph, Mo.

H. C. SIMMONS of Bennington, Vt., has secured the contract for heating the new Methodist church.

ANTHES BROS. PLUMBING COMPANY, Fort Madison, Iowa, have the contract for covering the pipes in the First Ward and High School buildings. They are also at work on the steam heating and plumbing for the Masonic Temple, Lee County Savings Bank Building, and have completed a fine job in the Hesse Block, corner of Second and Pine streets.

J. MALLMAN & Co., 134 Center street, Chicago, are doing the plumbing, gas fitting and sewerage in the O'Neal Building, Lincoln avenue and George street.

FRANK J. RUH, 1204 Diversey street, Chicago, has contracts for the plumbing, gas fitting and sewerage in the following residences: Peter Glnd, 842 Lincoln avenue; John A. Lundahl, 1318 Wolfram street; John Krunze, Clifton and Belmont avenues.

GEO. L. ROOD, 79 Lake street, Chicago, is to place a Prince Royal combination heater in the residence of Dr. O'Neal, 113 Garfield boulevard.

AMONG THE CONTRACTS recently taken for steam heating by the Charles H. Simmons Company, 72–74 Market street, Chicago, can be mentioned the following: Office building, River and Dock streets; flat building of Mrs. Thos. Burrows, 298–306 Erie street; three houses of Nortman, Schlack & Gutrich, Boulevard place.

Decimal Sheet Metal Gauge.

The Norfolk & Western Railroad, says the *Railroad Gazette*, has taken a step in the right direction in casting aside the present confusion and annoying gauges for sheet metal, wire, tubing, &c., and has started a decimal system which prevents discussion as to what a gauge number means. Specification 10 B, issued by R. H. Soule, superintendent of motive power, is for a gauge for sheet metal, wire and tubing, and is as follows:

Sheet metal, wire and tubing (less than ¼ inch in thickness), should always be ordered by expressing the thickness in decimals of an inch, in accordance with the following table, in which the figures in heavy type are decimals of an inch and are to be used in making requisitions; the figures in lighter type show the nearest thickness according to the Birmingham gauge, these light figures being given for convenience of reference only.

Inches.	Birmingham gauge.	Inches.	Birmingham gauge.	Inches.	Birmingham gauge.	Inches.	Birmingham gauge.
.002	....	.022	24	.065	16	.125	11
.004	36	.028	22	.070	15	.135	10
.006	35	.032	21	.075	..	.150	9
.008	33	.036	20	.080	14	.165	8
.010	31	.040	19	.085	..	.180	7
.012	30	.045	....	.090	..	.200	6
.014	28	.050	18	.095	13	.220	5
.016	27	.055	17	.100	..	.240	4
.018	26	.060	...	.110	12	.250	3

These gauges are made in the usual form of a disk by the Brown & Sharpe Mfg. Company, and Mr. Soule has made arrangements so that any one wishing them can purchase them direct from that company. It is understood that they are kept in stock. The large figures in the table give the dimensions of the notches in the gauge and the small figures give the nearest Birmingham gauge number.

Six hundred Slav laborers employed at the Edgar Thomson blast furnaces, Bessemer, Pa., have refused to accept a reduction in wages and have gone out on a strike. Eight of the nine blast furnaces have been banked.

The first extensive cold wave of the season has had a severe grip on the country during the past week. The mercury fell to 32° below zero in the Adirondacks.

The Baltimore & Lehigh Railroad, which is now being extended to York, Pa., is about to substitute electricity for steam as its motive power.

TRADE REPORT.

The Iron Market.

The record of the last week in 1894 has not been been very cheerful, particularly on account of the low prices made in the Central West on Bessemer Pig and on Steel Billets. The year closed with sales of Bessemer Pig for early delivery at $9.80 @ $9.85, Pittsburgh, the lowest on record.

Steel Billets have declined to $14 80 @ $14.85, Pittsburgh, with quite an active market, consumers evidently feeling that it is safe to cover early requirements. Reports have it that Chicago has captured a 10,000-ton order in the Cleveland district.

In Eastern Pennsylvania $17, delivered, has been touched, which makes the Western price, on the basis of open freights, a little lower. Wire Rods have weakened further and now $21 at Western mill can be done.

All this means that prices are down to bed rock, and that it is hardly worth taking the chances of possible future contingencies for the sake of reaching a possibly slightly lower level.

Conspicuous among these contingencies is the danger of labor troubles. The lowering of the scales by a leading Pittsburgh concern may drive others in the same direction. It is a step which is much to be deplored.

A number of moderate Cast Pipe orders have been placed and others are getting into shape.

There is little real change in the market for Foundry Pig. The Southern railroads have announced an advance of 25¢ in freight rates to the coast and New England markets. The impression is that they really mean it this time.

The following remarks regarding the Eastern Iron trade, furnished by our Philadelphia representative, show the prevailing condition of the Iron market at the close of 1894 : The outlook continues favorable as regards the volume of business, but prices are irregular and unsettled, and with the exception of Foundry and Mill Irons, which are steady, almost everything has a downward tendency. At these low prices any material decline is out of the question, but when the margin between actual cost and actual selling prices is so extremely narrow, even fractional declines assume considerable importance. Fuller time is being made, however, than was the case earlier in the year, and it is probable that manufacturers are doing as well as at any time during the past twelve months, and very much better than they were during the latter part of 1893, so that the general result is favorable, notwithstanding the low prices. The outlook for the coming year may also be said to be fairly encouraging, but nothing decidedly aggressive is looked for until the next crop begins to develop. It is satisfactory to note that most of the iron works will start the new year with a fair amount of work in hand, also that negotiations now in progress promise well for its continuance.

Pig Iron.—The announcement of an advance of 25¢ a ton in the freights from Southern furnaces to Northern consuming points is the most important event of the week. The New York market continues very quiet. We quote $12 @ $12.50 for No. 1 ; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

Our Philadelphia representative writes: The year closes on a fairly steady market, and it looks as though prices would be relatively firm for Foundry Irons. Consumption is increasing, however, and as there is a possibility of higher cost for both Ores and Coke, prices of Pig Metal may in that case be worked a little higher, but the general impression is that 1895 will be a year of extraordinarily low prices. At the moment there is not much disposition to buy in advance of requirements, although orders could be placed at practically the lowest figures ever recorded. The movement in prices during the year shows a decline of about $1.50 on Foundry Irons, quotations on the first of each month being as follows:

JANUARY, 1894.	
No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25
FEBRUARY.	
No. 1 Foundry	$13.00 @ $14.00
No. 2 Foundry	12.50 @ 13.25
MARCH.	
No. 1 Foundry	$13.00 @ $13 50
No. 2 Foundry	12.25 @ 12.75
APRIL.	
Standard No. 1 Foundry X	$12.75 @ $13.25
Standard No. 2 Foundry X	12.00 @ 12.50
No. 2 Plain	11.00 @ 11.25
MAY.	
Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.75 @ 12.25
JUNE.	
Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.50 @ 11.75
JULY.	
Standard No. 1 Foundry X	$12.50 @ $13.00
Standard No. 2 Foundry X	11.50 @ 12.00
AUGUST.	
Standard No. 1 Foundry X	$12.50 @ $13.00
Standard No. 2 Foundry X	11.50 @ 12 00
SEPTEMBER.	
Standard No. 1 Foundry X	$12.50 @ $13.00
Standard No. 2 Foundry X	11.50 @ 12.00
OCTOBER.	
Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.50 @ 11.75
NOVEMBER.	
Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.50 @ 11.75
DECEMBER.	
Standard No. 1 Foundry X	$12.50 @ $13.00
Standard No. 2 Foundry X	11.50 @ 11.75

Advices from Chicago report that during the week sales of local Coke Iron were particularly good. Several contracts were made for good lots, in some cases running as high as 750 tons. Quite a number of foundrymen ordered shipments to be made to their yards, so as to be in readiness to start up immediately after the first. Business is, therefore, in much better condition than usual at this time of the year. Several important contracts are also pending. Prices on local Coke Iron are well maintained at the advance recently made, but Southern Coke Iron is giving way, and the margin between local and Southern Irons has been considerably lessened. Contracts taken for Southern Iron during the week were made at cut prices by leading Southern companies which have heretofore claimed that they were well fixed for business and would not make low prices. Quotations are as follows, for cash:

Lake Superior Charcoal	$13.00	@	$14.00
Local Coke Foundry, No. 1.	10.25	@	10.50
Local Coke Foundry. No. 2..	9.75	@	10.00
Local Coke Foundry No. 3.	9.50	@	9.75
Local Scotch	10.50	@	11.00
Ohio Strong Softeners No. 1	12.50	@	13.00
Southern Silvery, No. 1	11.50	@	11.75
Southern Silvery, No. 2	11.25	@	11.50
Southern Coke, No. 2..	10.00	@	10.50
Southern Coke, No. 3	9.75	@	10.25
Southern, No. 1, Soft	10.00	@	10.50
Southern, No. 2, Soft	9.75	@	10.25
Alabama Car Wheel	17.50	@	18.00
Jackson County Silvery	15.50	@	16.00
Other Ohio Silvery	14.25	@	14.50

Foundry Iron is very quiet in the Pittsburgh market and some low prices are reported to have been made. Quotations are given as follows:

No. 1 Foundry	$11.00	@	$11.25, cash
No. 2 Foundry	10.50	@	10.65 "

Advices from Cincinnati are to the following effect: There has been scarcely a feature in the local market for Pig Iron during the past week worthy of special mention. As a rule, the orders received have been few and for small amounts, yet a few firms have been rewarded by a fair run of business. The disposition of buyers to hold off has resulted in some accumulation of stocks at furnaces in the South. At the close there is more inquiry, and one or two large buyers are in the market for round amounts, one sale of 3000 tons of Foundry Iron being noted at about inside quotations. The Pipe works continue to be the largest melters of Iron at the moment, the relatively low prices current for Pipe, permitted by the low market for Pig, inducing most of the large cities in the country to provide the means to renew and expand present water systems. In fact, there is a general anticipation of a large volume of business after the 15th inst., but with ample Iron offering no advance in prices is expected. Northern Iron is being offered more freely; especially is the Chicago output reported to be seeking a market in Indiana and elsewhere in this territory at a low level. A prominent feature of the general situation in the South among furnaces seems to be an extreme diversity of opinion respecting the present value of Iron, as well as the future course of the market, the result of the various and conflicting views being an unsettled, if not an erratic, market. Quotations are as follows :

Southern Coke, No. 1	$9.75	@	$10.00
Southern Coke, No. 2	9.00	@	9.25
Southern Coke, No. 3	8.50	@	8.75
Ohio Soft Stone Coal, No. 1	14.50	@	15.00
Ohio Soft Stone Coal, No. 2	14.00	@	14.50
Lake Superior Coke, No. 1	11.75	@	12.25
Lake Superior Coke, No. 2.	10.75	@	11.50
Hanging Rock Charcoal, No. 1..	16.00	@	16.50
Hanging Rock Charcoal, No. 2..	15.50	@	16.00
Tennessee Charcoal, No. 1	13.00	@	13.50
Tennessee Charcoal, No. 2	12.00	@	12.50
Standard Southern Car Wheel	15.75	@	16.75
Lake Superior Car Wheel and Malleable	14.25	@	14.75

DERWENT FOUNDRY COMPANY, Ellwood City, Pa., are erecting an enameling furnace in connection with their plant, to enamel iron articles of all kinds.

Metal Market.

Pig Tin.—Prices have receded sharply and the market remains in a weak, unsettled condition, suffering from the weight of heavy stocks here and in Europe, together with unusually large quantities afloat. It is calculated that the visible supply on January 1 was 24,614 tons, against 22,445 tons last month, and 16 390 tons a year ago. Spot stock in the United States, exclusive of Pacific Coast, is estimated at 2714 tons, and the quantity afloat at 1585 tons. European spot stocks were 13,674 tons and the afloats 6641 tons. Shipments from the Straits during December amounted to 5020 tons, of which 1120 tons to United States, 3100 tons London, and 820 tons to the Continent. Speculation here has been fairly active, with the leading operators prominent as sellers of near futures, and also offering the distant deliveries at a discount. Retail business has been tame, and prices for small lots are unchanged at last week's quotations, viz.: 15¼¢ @ 16¢ ℔ lb for Straits Pig.

Copper.—No new features have come to the surface during the past week, but a quasi air of mystery is still assumed by the leading sellers, who represent the market as being very firm, yet give no particulars of any important business. From the few facts divulged it would appear that the demand for material for electrical purposes is relatively better than that experienced for other sorts. Inquiries are being received for small quantities for immediate delivery, but orders are still very limited. Lake Ingot in small lots from store is still quoted at 10½¢ ℔ lb.

Sheet Copper.—There is little movement in the trade at the present moment. Consumers are generally engaged in stock taking and figuring out their future requirements. A few weeks will probably develop more inquiry. As the amount of building in prospect is larger than it has been for some time past, there is the likelihood that a gratifying improvement in the demand for Cornice and other manufactured Copper may be brought about in the coming months. Prices are firm for small lots of Sheet Copper from store on a net basis of 15¢ ℔ lb.

Pig Lead.—Business has been on a very moderate scale and the market has shown rather poor form, since consumers have manifested reluctance to take round lots of common Western at over 3¢. The retail demand is fair, small lots being quoted at 3⅝¢ @ 3¾¢ ℔ lb.

Lead Pipe and Sheet.—Jobbers report a very tame demand, although inquiry has been rather larger since the first of the year. No great revival in the business is looked for, however, much before early spring. Prices are weak, though the list is unchanged in this district. A reduction in rates on Lead Pipe and Sheet made by a Pittsburgh Lead company is noticed in another column.

Spelter.—Business has been moderate during the week and the demand is slow in this vicinity. The market is steady, however, deapite it narrowness. Prices rule for small parcels at the same figures quoted for several weeks past—namely, 4¢ @ 4¼¢, for Western, and the usual premium on fancy brands.

Antimony.—The market has remained quiet, with prices barely steady. Cookson's in small retail lots is quoted at 9¼¢ @ 9½¢, and Hallett'a at 8¢ ℔ lb.

Nickel.—Prices remain at about 38¢ @ 42¢, according to size of order.

Tin Plates.—Little improvement has taken place in aales of stock goods, and the buying of futures has been on a moderate scale. Jobbers report, however, that the volume of inquiries has increased to a gratifying extent within the last few days. A tendency is also seen toward an interest on the part of consumers in larger lots than they have cared to think of lately. It is hoped that many of these inquiries may materialize and that a brisker business in Tin Plates will develop within the next week or two, when purchasers have figured out their requirements for the month. Stocks are fairly heavy, but the assortment is still rather poor, especially in odd sizes. Prices have not varied much, but are rather weak.

A London cable dispatch of January 2 to *The Iron Age* reports on the British Tin Plate market as follows: In the Tin Plate market business has been slow, although more inquiry was made toward the close of the week. Prices have not changed materially. Shipments have been heavy, but stocks still amount to 225,000 boxes. The quotations, f.o.b. Swansea, are as follows:

Bessemer Cokes, IC 14 x 20	@ 9/6
Siemens Cokes, IC 14 x 20	9/9 @ 10/
J. B. Steel Cokes, IC 14 x 20	
Ternes, 20 x 28	18/6 @ 21/
Charcoals, IC 14 x 20	10/6 @ 12/6

Sheet Iron.—Mills are fairly well supplied with orders for deliveriea extending into the next three months, and inquiry in this class of business is active. Spot and jobbing business in Black Sheets is light. Galvanized Sheets are in moderate demand. Prices show no change.

Chicago Report.

Scrap. — Only small trades are in progress at this time. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per ℔
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.50	....
Stove Plate (free of burnt)	4.25	....
Burnt Iron and Grate Bars	3 00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2¼¢
Rubber	....	4½¢

Anthracite.—The trade is quiet. Carload lots of 12 net tons or over are quoted as follows:

	Egg, Grate.	Sto. and Ch.
Chicago, Ill	$4.75	$5 00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8.10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

CONDITION OF THE

Hardware Trade.

TRADE DURING the past year was somewhat disappointing to those who had formed expectations of a speedy recovery from the financial and mercantile depression of 1893, but on the whole it may be reviewed with a feeling of some satisfaction, in view of the increased volume of business over the preceding year and the manner in which the trade endured the continued depression. The volume of businesa was unquestionably fair, as compared with other years, so far as the quantity of goods is concerned, while the decline in values kept down the amount as expressed in dollars and cents. The trade was, however, somewhat spasmodic, periods of something like the old-time activity being followed by intervals when the demand fell off largely and the tone of the market became unsettled and weak.

It is not expected that the last week in December will be characterized by a great volume of business. The fact that travelers are home, that attention is given principally to closing the books and preparing for the new year, and that the holidays with their festivities and amenities engross to a good extent the energies of employers and employees, are influences the full force of which has been felt during the week under review. In other columns we discuss at some length the course of things during the past 12 months and touch upon the outlook for 1895. We trust that our readers have reason for a good degree of satisfaction in the retrospect and in the results of the past year, and to one and all we express the hope that the year which has opened will bring them a large measure of happiness and prosperity.

Advices from Chicago.—The Shelf Hardware trade is in a little better condition than usual at the close of the year. Traveling men are almost without exception at home, and consequently the orders received are those which are being sent in voluntarily by the country trade. Monday mails were not expected to be heavy, but exceeded expectations. In the course of the coming week the salesmen will again be on the road, and the prospects are excellent for immediate business. Prices have been revised for the coming year very extensively, Changes were made in prices from time to time during the year, but not so comprehensively as will now be done. In very few instances will there be an advance, but the reductions made are in some cases small and in others somewhat radical, to meet the new conditions now prevailing.

Notes on Prices.

The important reductions in price during the year have been chiefly in staple goods, but general and Shelf Hardware has to a great extent sympathized with the downward tendency, and the changes which have taken place are illustrated in those referred

to below, where we touch upon only a few of the many lines which enter into a Hardware stock.

Wrought Iron Pipe.—There has been considerable shrinkage in the prices of Pipe, and manufacturers are complaining of the unprofitableness of their products. There has been some conference with a view to determining what can be done to better the situation, and there is some talk of a new list.

Rope.—The market during the past year has been a vacillating one, and while there is not a marked difference in the prices prevailing now and those which prevailed last January there have been a number of changes during the year.

Steel Goods and Wood Goods.—In Steel Goods the decline in price has not been very great, but it is worth noting, and competition is active. Wood Goods, on the other hand, have, as the phrase is, gone to pieces, and lower prices rule.

Screws.—This is one of the lines in which an important reduction has taken place, the base discount being at the end of December 85 per cent., instead of 70 per cent. on the first of January last. At one time an effort was made to secure concerted action among the manufacturers, but without success.

Tacks.—It is worthy of mention that Tacks are somewhat higher than a year ago, owing to the good understanding between the principal manufacturers. Outside competitors are, however, making semewhat lower prices, but notwithstanding the fact that they are well occupied with orders they do not appear to be producing much impression on the general tone of the market.

Wire.—The low price current for Wire and Wire products is one of the features of the market, and there are as yet few signs of an improvement.

Bright Wire Goods.—Competition between the manufacturers has been strenuous, and low quotations have been current nearly all the year.

Wrought Goods.—A similar remark may be made in regard to Wrought Goods, which show a large decline in price during the 12 months under review.

Nails.—During the past year, while the sale of Nails was probably larger than for the preceding year, the decline in price which began in 1893 continued and low quotations prevailed, the market closing at as low figures as had been made at any time during the year.

Wire Nails.—The last week of the year developed nothing of special importance in the Wire Nail market. The volume of business shows, however, a marked falling off, which is attributed principally to the fact that at this season comparatively little attention is given to the placing of orders. It is noted, however, that there is a good deal of inquiry, and manufacturers regard the prospect for a large demand during the next month or two as excellent. Prices are without quotable change, but there is possibly a slightly less firm tone to the market. Small lots from store in New York are held at $1.15 to $1.20. An important transaction is announced, inasmuch as the Bigelow & Dowse Company of Boston have purchased the entire stock of Wire Nails at the Carnegie mills in Beaver Falls. We understand that this purchase, which covers a complete assortment, is in the vicinity of 40,000 kegs.

Advices from Chicago.—The local manufacturers are sold well ahead, but outside concerns have pursued a more conservative policy, and have great faith that they will be rewarded for their action by much better business, at better prices, when the usual large volume of trade comes up in January and February. Jobbers quote small lots from stock at $1.10, and for direct shipment from factory at $1.05, with mixed carloads at $1.

Cut Nails.—The Cut Nail Market is inactive and prices unchanged. Small lots from store, in New York, at 90 to 95 cents.

Advices from Chicago.—Manufacturers' orders connue to be a little heavier than usual. The shipments made last week were exceedingly good, causing the representatives of this branch of trade to feel in very much better humor over present business and coming prospects. Prices are unchanged at $1 for small lots from stock.

Barb Wire.—The Barb Wire market is sluggish, but prices have not receded further. The tone of the market, however, is not strong. Manufacturers continue to take a hopeful view of the outlook for next year, and expect to market a very large quantity of Wire.

Advices from Chicago.—Business generally has been light since last report, but the few salesmen who are still out continue to pick up orders of more or less consequenee from day to day. A much better trade is expected in January. Quotations are now $2 and $1.65 for small lots for direct shipment from factory, and $2.10 and $1.75 for small lots shipped from stock.

White Lead.—Practically the same conditions exist that have prevailed for several weeks. Buyers of round lots of dry Lead place orders indifferently, since present indications point to ample supplies in the near future, while the surroundings are bare of anything that would cause apprehension of higher prices. Orders for Lead in Oil are of unimportant volume at the moment, most jobbers having their near future wants well provided for, while the smaller trade are slow about putting in supplies for the spring season. There is still more or less irregularity in prices, but no positive changes have taken place recently in either American or foreign brands.

Red Lead.—A moderate business only has been effected of late and buyers manifest indifferent interest. The larger consumers have their probable near future wants well provided for and manufacturers and importers offer somewhat reservedly in consequence. Prices for both domestic and foreign makes remain unchanged.

F. E. Myers & Bro.—The extensive line of Force, Lift, Windmill, Tank, Spray and Cylinder Pumps manufactured by F. E. Myers & Bro., Ashland, Ohio, and listed in their catalogue, is subject to a discount of 55 per cent. to the trade, 60 days. The firm are offering net prices on Myers' Hay Carriers, Forks, &c., which will be furnished on application.

Lead Pipe and Sheet Lead.—Bailey-Farrell Mfg. Company, Pittsburgh, Pa., informs us, under date of January 1, that their prices for Lead Pipe in whole coils is 4½¢ and Sheet Lead, 5¢ per lb., subject in both cases to the usual discount of 20 %.

Shot.—Under date of January 1, 1895, a reduction in the price of Shot is announced, the market being now represented by the following quotations:

Drop Shot, sizes smaller than B, per 25-pound bag	$1.10
Drop shot, sizes smaller than B, per 5-pound bag	.30
Drop Shot, B and larger sizes, per 25-pound bag	1.35
Drop Shot, B and larger sizes, per 5-pound bag	.35
Buck and Chilled Shot, per 25-pound bag	1.35
Buck and Chilled Shot, per 5-pound bag	.35
Dust Shot, per 25-pound bag	1.75
" " " 5 " "	.40

Terms, net cash, 30 days, or 2 per cent. discount for cash within 10 days of invoice date. In lots of 2000 pounds and upward, taken at one time, a discount of 20 cents per 100 pounds and 2½ per cent. will be allowed.

Glass.—The beginning of the new year brings no perceptible change in the condition of the Glass trade. There is very little demand either from factories or from jobbers for Glass, though it is reported that factories will be busy for four to six weeks to come in filling orders already taken. The impression generally prevails that spring will show an improvement in trade. The question whether prices will advance with the year is problematical, and different opinions are expressed on the subject by those connected with the Glass trade. To some indications point to higher prices before next fall, while others believe that prices will largely be under the control of jobbers, owing to the large quantities of Glass bought by them at prices lower than 90 per cent. discount. Owing to the demoralization of prices and the lack of demand, no reliable quotations are available at the present time. As an indication of recent prices, however, it may be stated that during the latter part of December, 1894, a Cleveland jobbing house quoted Pittsburgh Window Glass as follows: Single strength, 85 and 20 per cent. discount; double strength, 85 and 20 and 5 per cent. discount. A comparison of prices during the past year shows that Pittsburgh Glass in car lots at factory opened January 4, 1895, at 85 and 5 and 5 per cent. discount for single, and 85 and 10 and 5 per cent. discount for double strength. In June the price quoted was 80 and 10 and 5 for single, and 80 and 20 per cent. discount for double strength Glass. In December the market was represented by a quotation of 90 to 90 and 10 per cent. for both single and double strength Glass.

Old Metals.—The market is quiet and prices unchanged. The following quotations represent the current rates paid by dealers in the city:

Heavy Copper	₩ lb 7 ¢
Light and Tinned Copper	₩ lb 6½¢
Heavy Brass	₩ lb 4¾¢
Light Brass	₩ lb 3¾¢
Lead	₩ lb 2¾¢
Tea Lead	₩ lb 2½¢
Zinc	₩ lb 2⅛¢
No. 1 Pewter	₩ lb 10 ¢
No. 2 Pewter	₩ lb 5½¢
Wrought Scrap Iron. ₩ gross ton	$7.50 @ $8.00
Heavy Cast Scrap. ₩ gross ton	7.50 @ 8.50
Stove Plate Scrap. ₩ gross ton	5.00
Burnt Iron. ₩ gross ton	3.00

Old Rags, Paper, &c.—Demand is fair and prices substantially the same as those quoted last week. New York dealers' purchasing rates are as follows:

No. 1 White Rags	℔	3	@ 3¼¢
No. 2 White Rags	℔	2¼	@ 2½¢
Mixed Rags	℔	¾	@ 1 ¢
Blues and 3ds	℔	1⅛	@ 1⅜¢
Hard Sized White Shavings	℔	2⅛	@ 2¼¢
No.1 White Book Shavings	℔	1¾	@ 2⅛¢
No.2 White Book Shavings	℔	1	@ 1⅛¢
Light Book Shavings	℔		⅝¢
No. 1 Mixed Shavings	℔	⅞	@ 1 ¢
No. 2 Mixed Shavings	℔	⅝	@ ¾¢
No. 1 Printed Books	℔	1	@ 1¼¢
Ordinary Mixed Books	℔	½	@ ¾¢
Newspapers	℔		2-5¢
No. 1 Manila Paper	℔	¾	@ 1 ¢
No. 2 Manila Paper	℔	⅝	@ ¾¢
Bogus Paper	℔		½¢
Common Paper	℔	¼	@ 3-5¢
Straw Chips	℔		⅜¢
Binders' Clippings	℔		½¢
Jute Butts	℔	1½	@ 1¾¢
No. 1 Jute Bagging	℔	1	@ 1¼¢
Mixed Bagging	℔	¾	@ 1 ¢
No. 2 Bagging	℔	½	@ ¾¢
Hemp Twine	℔	2	@ 2¼¢
Manila Rope	℔	2	@ 2⅛¢
Jute Rope	℔	1½	@ 1¾¢
Mixed Rope	℔	¾	@ ⅞¢

Old Rubber.—The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots, ℔	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory, ℔	@ .05¼
Rubber shoes, less than carloads, ℔	@ .04¾
White Wringer Rolls, ℔	@ .03⅞
White Syringes, ℔	@ .03⅞

Recent Revisions in Brass Lists.

IN PRICE-LIST No. 4 of the American Brass Manufacturers, recently issued, a number of minor changes have been made and new matter added, as follows:

Roll and Sheet Brass.

On page 3 has been inserted, "Add for polishing on one side 40 cents per square foot; on both sides, double this price. Segments, Pattern Sheets and Circles cut from above metal of proportionate width, No. 10 and thinner, 6 cents per pound additional. Segments, Pattern Sheets and Circles cut from above metal of proportionate width, thicker than No. 10, 10 cents per pound additional. Patent Leveled Engravers' Sign Brass, not more than 30 per cent. discount on above list."

Slitting Metal.

On page 4 this explanation or definition has been parenthetically inserted: "Drawn strips are all metal drawn in dies, thinner than No. 8 Brown & Sharpe gauge; No. 8 Brown & Sharpe gauge and thicker, listed and sold as rectangular rod."

Sawed Metal.

On the same page is new matter, as follows: "All metal heavier than No. 6 Brown & Sharpe gauge, listed and charged as sawed metal, whether slit or sawed."

Printers' 2 x 4 Sheets and Galley Sheets.

On page 5 a reduction has been made on High Brass Screen Plates from net 15 cents per pound to net 13½ cents per pound.

German Silver.

On page 7 where formerly the price for slitting German Silver was double that for slitting Brass, a decrease has been made, the charge now being uniform for either metal at the rate heretofore charged for slitting Brass.

Brazed Brass Tubing.

On page 9 the following provisions are now regularly a part of the list, where before they were special and variously interpreted by individual concerns: "3-inch, per pound, 40 cents; over 3 inch to 3½-inch inclusive, 45 cents per pound; over 3½-inch, 50 cents per pound."

At the bottom of the page in the same classification has been added, "Combination Tubing, 60 cents per pound. For price on rectangular brazed Tubing, take diameter from shortest side and charge accordingly."

Brass Moldings.

On page 10 will be found new matter as follows: "Angle and Channel Brass to be listed and sold as Half-Round Molding." Immediately following this, the text has been entirely remodeled, and is now as follows:

High Brass Door Rail, 1 inch and wider, No. 18 Brown & Sharpe gauge and heavier, polished or unpolished, 36 cents per pound.
Less than 1 inch in width, 40 cents per pound.
Lighter than No. 19 Brown & Sharpe gauge, advance of 2 cents per pound for each number.

It will be noticed that the list given above as 36 cents was formerly 35 cents.

Trade Notes.

THE COOLEY SAD IRON COMPANY of Kansas City, Mo., have been incorporated, with a capital of $9000, fully paid in. Herbert M. Cooley, William G. Hawes, Darwin Wentworth, Willard C. Parker, and Clarence S. Palmer are the incorporators.

THE GEORGIAN BAY MICA, MINING & MFG. COMPANY of Salamanca, Cattaraugus County, New York, have been incorporated at Albany, to mine and market minerals, including Mica, Copper, &c. The company's capital is given as $60,000, and the directors named are John J. Inman, Nicholas L. Kysor of Salamanca, and Henry Harris of Parry Sound, Ont., Can.

THE NILES STAMPING COMPANY have been incorporated at Niles, O., with a capital of $5000, by L. G. Hutchison, F. C. Robbins, J. F. Morris, Geo. B. Robbins and C. W. Perkins, for the purpose of buying and selling sheet metal and sheet metal products and to manufacture sheet metal merchandise.

The free class in architectural and mechanical drawing, at the Senior Evening School, 58 Fifty-second street, near Eighth avenue, New York City, was resumed on Thursday, January 3, 1895. Students of architecture, machinists, masons, carpenters and those working in handicrafts generally who wish to avail themselves of the opportunity offered by these free classes are invited to apply on any school evening after 7 o'clock.

A Chicago company are said to be desirous of furnishing illuminating gas in New York City at a charge of 90 cents and fuel gas at 75 cents per 1000 feet. Senator Sullivan is to introduce a bill in the New York Legislature to grant the company a charter.

The Belgian briquette industry is all that is making remarkable progress. Exports for the ten months of this year ending with October reached a total of nearly 500,000 tons, or double the amount exported in the corresponding period of 1892.

CONTENTS.

Editorials:	Page.
Retrospective	29
Finance and Other Matters	29
Our American Tin Plate Lists	29
Business Mortality in 1894	29
The Letter Box—	
Galvanizing Iron Castings	30
Pipe for Heating Water	30
Evans Hot Air Furnace	30
Roofing and Cornice—	
The Roofing and Cornice Trade	31
New Roofers' and Tinners' Furnace. Illustrated	32
Flashings	32
Sheet Metals	32
Miscellaneous	34
Plumbing and Gas Fitting—	
Review of the Plumbing Trade	35
The Chicago Master Plumbers	36
President Redieshe's Address	36
Traps and Vents	37
Scrap	37
Steam and Hot Water—	
Steam and Hot Water Heating Trade	38
Opinions of the Trade	38
National Fitters' Association	39
Heating Notes	39
Tin Plates—	
Tin Plates in 1894	40
List of American Manufacturers of Tin and Terne Plates and Their Brands.	42
Alphabetical List of Brands of American Tin and Terne Plates	43
The Coal Mining Situation	45
Stove Trade Notes—	
The Stove Trade of 1894	46
Opinions from the Trade	49
Miscellaneous	50
The Vapor Stove Trade in 1894	50
Vapor Stove Consolidation	51
Gas Stoves and Appliances	51
The Proposed Stove Reclassification	51
Odd Plates	51
Heating and Plumbing—New Work and Contracts	53
Decimal Sheet Metal Gauge	53
Trade Report—	
The Iron Market	54
Metal Market	55
Chicago Report	55
Condition of the Hardware Trade	55
Notes on Prices	55
Recent Revisions in Brass Lists	57
Trade Notes	57
Metal and Miscellaneous Prices	58
Labor Exchange—	
Help Wanted	60
Situations Wanted	60

Metal and Miscellaneous Prices.

CHICAGO, JANUARY 3, 1895.

Tin—

Straits pigs .....16¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 26.50
	DC, 12⅝ x 17	@ 5.50
	DX, 12⅝ x 17	@ 7.25
Allaway Grade.	IC, 10 x 14	@ 5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke	IC. 10x14.14x20.	$4.75 @ 5.00
	IC, 14x20.90 lb	4.25 @ 4.50
	IC, 14x20. 100lb	4.50 @ 4.75
	10 x 20	@ 7.25
	20 x 28	@10.00
	IX, 10x14, 14x20	@ 6.25
B.V. Grade.	IC,10x14, 14x20	@ ....

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—

IC. 14 x 20 @$5.00
20 x 28 $9.50@10.00
IX. 20 x 28 12.00@12.50

Worcester Brand and equal.—

IC. 14 x 20 @ 5.25
IC, 20 x 28 16.00@10.50
IX, 14 x 20 6.25@ 6.50
20 x 28 12.50@13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56		$12.50
XX, 14 x 56	$29.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva :

IC, 10 x 14, 12 x 12, 14 x 20$5.37½
IX, 10 x 14, 12 x 12, 14 x 20.6.62½

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.75
IX, 10 x 14, 12 x 12, 14 x 20. 7.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.25
IX, 10 x 14, 12 x 12. 14 x 20.. 8.00

Usual extras or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed :

IC, full weight, 14 x 20.....$5.75
IX, full weight, 14 x 20..... 7.50

Irondale A A :

IC, full weight, 14 x 20..... 5.25
IX, full weight, 14 x 20..... 6.75

Irondale A :

IC, full weight, 14 x 20..... 5.00

Irondale B :

IC, 100 lbs , 14 x 20 ..... 4.75
IC, full weight, 14 x 20..... 4.85

Irondale C, IC, 14 x 20, 100 lbs..... 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates.—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $5.00
Old Hundred, IC, 14 x 20, 100 lbs.... 4.75
R. W. & B., IC, 20 x 28, 216 lbs.....10 00
Old Hundred, IC, 20 x 28, 200 lbs.... 9.50

Roofing Plates.

Palm, IC, 20 x 28.....@$10.00
Palm, IX, 20 x 28..... ..... @ 12.25
Empire, IC, 20 x 28.....@ 10.75
Empire, IX, 20 x 28.....@ ....
Hickory, IC, 20 x 28.....@ 11.50
" IX, 20 x 28.....@ 14.10
Alaska (heavily coated), IC, 20x28@ 13.50
Alaska IX, 20 x 28.....@ 16.70
Special, IC, 20 x 28.....@ 13.50
" IX, 20 x 28.....@ 16.50
Niagara, IC, 20 x 28 ..... 9 50
Iroquois, IC, 20 x 28..... 9.00

Westmoreland :

IC, 14 x 20 ..... 5.12½
IC, 20 x 28..... 10.25

Kenwood :

IC, 20 x 28..... 10.00

Furmston :

IC, 20 x 28..... 9.75
Irondale AA, IC, 14 x 20.....
Irondale A, IC, 20 x 28..... 10.50
Irondale B, IC, 20 x 28..... 10.10
Each extra cross $1.50.
Challenge, IC, 20 x 28.....10.50

Juno :

IC, 14 x 20.....
IC, 20 x 28.....

Illinois, Old Method :

IC, 20 x 28..... 13.50

E. L.:

IC, 20 x 28..... 11.00

Jessie :

IC, 20 x 28..... 10.50

Old Process :

IC, 14 x 20..... 8.00
IX, 14 x 20..... 9.50
IC, 20 x 28.....16.00
IX, 20 x 28.....19.00

H. B. L., Old Style :

IC, 14 x 20..... 7.00
IX, 14 x 20..... 8.25
IC, 20 x 28.....14.00
IX, 20 x 28.....16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.65

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 1-10¢	2 8-10¢
17 to 20	₩ lb 2 2-10¢	2 9-10¢
21 to 24	₩ lb 2 3-10¢	3 ¢
25 and 26	₩ lb 2 4-10¢	3 1-10¢
27	₩ lb 2 5-10¢	3 2-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....18¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata, or first quality.....dis.75&10%

Copper—

Ingot.

Lake..... 11 ¢ @ 11½¢
Casting Brands..... 10 ¢ @ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch ..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .48
Plain, ¼ inch up to 5-16 inch ..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... .....4¢

Sheet Zinc—

600 lb casks..... $4.75
300 lb casks,..... 4.95
Loose sheets..... 5.05

Solder—

⅛&¼..... 10½@11½¢
Extra Wiping..... 9¼@10½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9½¢

Lead—

Soft Pig Lead.....3½¢
Bar.....4¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe

1¼ and under, Plain.....57½&10&10%
1¼ and under, Galv.....50&10&10%
1½ and over, Plain..... 67½&10&10%
1½ and over, Galv.....67½%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd..... 65%
Ritchie's Spiral Lock Seam, Galv'd... 60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated..... 65%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list..... 50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles :
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....₩ lb, 2 ¢
" " Brown.....₩ lb, 1½¢
" " Purple.....₩ lb, 2½¢
" Ground in oil, B. Red ₩ lb, 6½¢
" Ground in oil, Red..₩ lb, 6½¢
" Ground in oil, Brown ₩ lb, 5½¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls.....59¢
Linseed Oil, Raw, in bbls .....56¢
Mineral Paints.....2@4¢
Orange Mineral..... 8¢
Pure White Lead in Oil.....5¼@5½¢
Dry White Lead in bbls.....4½@5¼¢
Red Lead, American.....5½@5¾¢
Red Venetian, English, dry .....1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs.....7½¢
Sipe's Japan Oil, in bbls. ₩ gal..... .34¢
Spirits Turpentine, in bbls., ₩ gal@33½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.50
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.15
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.50
Roofing Pitch, lb bbl. of 300 lb.....$3.00

NEW YORK, JANUARY 4, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots.....₩ lb, 63¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting :
Small lots.....₩ lb, 60¢
100-lb lots.....₩ lb, 55¢
Ton lots.....₩ lb, 53¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting :
Small lots.....₩ lb, 55¢
100-lb lots.....₩ lb, 53¢
Ton lots.....₩ lb, 50¢

Antimony—

Cookson.....₩ lb, 9¼@9½¢
Hallett's.....₩ lb, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.	
¼-in. up to 2-in.	$0.35	25 @ 30%
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝-in.	.38	
⅜-in. up to ½-in	.41	
5-16-in. up to ⅜ in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 16, inclusive,	.28	

Copper and Bronze Tubing—

8¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60&10%
Galvanized, Locked Joints .....60&10%
Tin.....60&10%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*19¢ ₩ lb, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....9½¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne. 60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....85%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	"

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. American.	Cleaned American.
Nos. 10 to 16	₩ lb 2.25	..	2.60¢
Nos. 17 to 21	₩ lb. 2.35		2.70¢
Nos. 22 to 24	₩ lb, 2.45		2.80¢
Nos. 25 and 26	₩ lb. 2.55		2.90¢
No. 27	₩ lb. 2.65		3.00¢
No. 28	₩ lb, 2.75		3.10¢
American B. B.	₩ lb, 4¢@4½¢		

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11@11½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢ 5%
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		75&5@75& 7½% off.
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig.....3¾@3¾¢
Bar.....4@4½¢
Pipe.....5¼¢ 20%
Tin Lined Pipe.....12½¢ 20%
Block Tin Pipe.....30¢ 20%
Sheet.....6¼¢, 20%
Old Lead in exchange, 2¾¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100 @ 500 lb 5¾
Lead, Amn. White, in oil..... .. @ 5¾
Lead, Red, bbls. and ½ bbls... .. @ 5¾
Lead, Red, kegs..... .. @ 5¾
Ocher, American..... .. @ 1½
Red Venetian, American..... .. @ 1¾
Linseed Oil :
Raw, ₩ gal..... .. @ .56
Boiled..... .. @ .59
Spirits Turpentine :
In bbls..... .. @ .30
Putty :
In barrels and ½ bbls..... .01½ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01¾ @ .02¼
In bladders..... .01¾ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton. .....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ lb..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch ₩ bbl.....$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe, " " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary....	1¼¢	15¢
Slag Wool, extra.	4¼¢	38½¢
Rock Wool, ordinary...	2¼¢	27¢
Rock Wool, extra.....	7¼¢	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D..... ₩ bbl. $1.42@$1.45
Rosin, E. & F..... ₩ bbl. $1.55@$1.62½
Rosin, G. & H. ..... ₩ bbl. $1.72½@$2.00
Rosin, I. & K..... ₩ bbl $2.40@$2 80
Rosin, M & N ₩ bbl $3 05@$3.40

Seamless Brass Tubes .net List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr.....$3.25@$4.50
Fen Argyle, ₩ sqr..... 3.70@ 4.00
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr..... 3.90@ 4.25
Lehigh Slates, ₩ sqr..... 3.00@ 4.50

Vermont:

Sea Green, ₩ sqr..... 2.50@ 2.75
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½&½, guaranteed ..... 11@11½¢
No. 1 ..... 9@9½¢
Prices of Solder indicated by private rands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.

In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs, about 55 lb, ₩ lb.....4¢
5 qts.

Yager's Soldering Salts.

½-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter.....4¢@4¼¢
Bertha (pure) .....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb.....16½@17¢
Straits, pigs, ₩ lb.....15½@16¢
Straits in bars, ₩ lb.....16½@17¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $6.50
Alderly, extra quality, IC, 14 x 20..5.62½
Allegheny, IC, 14 x 20..... 4.50
" IX, 14 x 20..... 5 75
Anchor IC, 14 x 20..... 4.37½
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Black Diamond (Extra Coated), IC, 14 x 20 ..... 7.50
Bonus (Extra Coated), IC, 20 x 28..11.50
" " " IX, 20 x 28..14.50
Boston, IC, 14 x 20..... 6.25
Brooklyn, IC, 14 x 20 ..... 4.50
Capitol, IC, 14 x 20..... 4.25
Central, IC, 14 x 20..... 4.75
Climax, IC, 14 x 20 ..... 4.50
Columbia, IC, 14 x 20..... 6 25
Columbus, IC, 14 x 20..... 4.75
Dunlap's Double Dipped, IC, 14 x 20 7.50
" " IX, 14 x 20 8.75
" Domestic, IC, 20 x 28.....10.00
Empire, IC, 14 x 20..... 5.12½
Eureka, IC, 20 x 28..... .....10.00
Eureka 200 lbs., IC, 20 x 28.... .... 9.70
Excelsior, IC, 14 x 20..... 4.75
Filbert, IC, 14 x 20..... 7.25
Flag, IC, 14 x 20..... 4.25
Florida, IC, 14 x 20..... 4.75
Flusbing, IC, 14 x 20..... 6 25
Freeport (Hand dipped and Resquared), IC, 14 x 20 ..... 6.50
IX, 14 x 20..... 7.75
Globe, IC, 14 x 20..... 4.50
Golden Star Old Style, IC, 20 x 28...15.00
" " " IC, 20 x 28...18.00
Grace, IC, 14 x 20..... 4.25
Hamilton's Best Redipped, IC, 14x20 7.75
" " IX, 14x20 9.25
Hickory (Resquared), IC, 14 x 20... 5.50
Junlati, IC, 20 x 28..... .....11.50
Juno, IC, 14 x 20..... 5 50
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20 ..... 4.75
Laufman's Apollo (Resquared), IC, 14 x 20..... 6.75
Laufman's Apollo (Resquared), IX, 14 x 20..... 8.25
Leominster, Extra Coated, IC, 14x20.6.37½
Lion (Stamped), IC, 14 x 20..... 5.75
Lulu, IC, 20 x 28..... .....10.50
" IX, 20 x 28 ....13.50
Maple, IC, 14 x 20 .... 5.75
Merchant's Roofing (Resquared). IC, 14 x 20..... 7.50
Meurer Roofing, IC, 14 x 20..... 7.75
National, IC, 14 x 20..... 5.50
Nava, IC, 20 x 28 ....10.50
New Castle Old Method, IC, 20x28. 18.00
New Castle Palm, IC, 20x28..... .....14.50
Old Colony, IC, 14 x 20..... 7.50
Osborn's Old Process, IC, 20 x 28....14.00
" " " IX, 20 x 28....17.00
Osceola, Old Style, IC, 14 x 20..... 7.25
" " IX, 14 x 20 .. 8.75
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 7.25
Phillips' Roofing, IC, 14 x 20..... 7.00
Phœnix, IC, 14 x 20..... 4.75
Pullman, IC, 14 x 20..... 5.75
Republic, IC, 14 x 20..... 4.75
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 8.00
Scott's Extra Coated (Resquared), IX, 14 x 20..... 9.50
Standard, IC, 14 x 20 ..... 4.15
Star IC, 20 x 28 ....11.00
Superior, IC, 14 x 20..... 4.50
Taylor's Old Method, IC, 14 x 50.... 6.50
Taylor Old Style (Resquared), IC, 14 x 20..... 7.50
Taylor Roofing, IC, 14 x 20..... 6.75
The Osborn Roofing, IC, 20 x 28.....12.25
" " " IX, 20 x 28.....15.25
Thomson's Puritan, IC, 14 x 20.....5 50
Tip Top, IC (Resquared), 14 x 20.... 4.88
" IX " 14 x 20.... 6.13
Triumph, Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20..... .....4.37½
Waldo, IC, 14 x 20..... 6.00
Westmoreland, IC, 14 x 20..... 6.25
Willow, IC, 14 x 20..... 5.25
Zero, IC, 14 x 20..... 4.50

American Bright Plates—

Almond, IC, 14 x 20.....$5.25
Brilliant (Tissue Packed), IC, 14x20. 8.00
Brooklyn, IC, 14 x 20..... 5.50
Century, IC, 14 x 20..... 5.00
Climax, IC, 14 x 20..... 4.87½
Excelsior, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 5.50
Florida, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Gladys, IC, 14 x 20..... 4.50
Hazel, IC, 14x20..... 5.80
Ivy, IC, 20 x 28..... .....12.00
" IX, 20 x 28..... .....15.00
Linden, IC, 14x20..... 5 50
Merchant's Dipped, IC, 14x20..... 10.00
Merlon, IC, 14x20..... 6.00
Mint, IC, 14x20..... 5.00
New Castle Best Palm Charcoal, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
New Castle Palm Charcoal, IC, 14 x 20..... 6.50
" " IX, 14 x 20..... 8.00
New Castle, Charcoal, IC, 14 x 20... 6 25
" " IX, 14 x 20... 7.50
New Castle, S. Charcoal, IC, 14 x 20. 6.00
" " IX, 14 x 20. 7.25
New Castle Palm Coke, IC, 14 x 20.. 5.75
" " IX, 14 x 20.. 6.85
New Castle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Oak, IC, 14 x 20..... 4.75
Palma, IC, 14x20..... 6.00
Pausy, IC, 20 x 28 ....10.50
" IX, 20 x 28 ....13.00
Phœnix, IC, 14x20..... 5.37½
" IX, 14x20..... 6.75
Royal, IC, 14x20..... 6.25
U. S., IC, 14x20..... 7.25
Versailles, IC, 14 x 20 ....5.75
Walnut, IC, 14 x 20..... 4.65
Youghiogheny, IC, 14 x 20... .. ..6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$6.25
20 x 28.....12.50
Pontymister Old Style Grade, IC, 14 x 20..... 5.50
20 x 28.....11.00
IX, 14 x 20..... 6.50
20 x 28.....13.00
Worcester Grade, IC, 14 x 20.... .. 4.50
20 x 28..... 9.00
IX, 14 x 20..... 5 75
20 x 28.....11.50
Dean Grade.—IC, 14 x 20..... 4.25
20 x 28..... 8.50
IX, 14 x 20..... 5.50
20 x 28.....11.00
Abercarne Grade.—IC, 14 x 20..... 4.00
20 x 28..... 8.00
IX, 14 x 20..... 5.50
20 x 28.....11.00
Mansel Grade, IC, 20 x 28.....8.00

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ lb.

Melyn and Cal-land Grade. IC, 10 x 14..... $5.25
" " IC, 12 x 12..... 5.50
" " IC, 14 x 20..... 5.25
" " IC, 20 x 28..... 10.50
" " IX, 10 x 14..... 6.50
" " IX, 12 x 12..... 7.00
" " IX, 14 x 20..... 6.50
" " IX, 20 x 28..... 13.00
" " DC, 12½ x 17..... 5.00
" " DX, 12½ x 17..... 6.50
Allaway Grade. IC, 10 x 14..... 4.75
" " IC, 12 x 12..... 5 .00
" " IC, 14 x 20..... 4 75
" " IC, 20 x 28..... 9.50
" " IX, 10 x 14..... 5.50
" " IX, 12 x 12..... 5 75
" " IX, 14 x 20..... 5.50
" " IX, 20 x 28..... 11.00
" DC, 12½ x 17..... 4.25
" " DX, 12½ x 17..... 5.00

Coke.

Steel Coke.—IC, 10x14, 14x20..... 4.25
10x20..... 6.50
20x28..... 8.50
IX, 10x14, 14x20..... 5.25
B. V. Grade.—IC, 10x14, 14x20..... 4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$11.50
IXX, 14x28..(112 sheets)..... 11.90
IXX, 14x31..(112 sheets)..... 13.25

Tinning—

Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv..... ..50&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892..... ....52½&5%
Inserted Joints Casing, list Nov. 16, 1892..... 47½%
Steel Boiler Tubes..... 27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 lb casks..... ₩ lb 4¾¢
Per lb..... 5¼¢

It Is Reported—

Colorado.

That the Bateman Hardware Company of SALIDA, have rented a building in FLORENCE, which they occupied with a stock of Hardware on January 1.

Florida.

That G. C. Culver of IOWA, has purchased a half interest in the Hardware business of W. R. Claxton, BARTOW. The style of the firm has been changed to Claxton & Culver.

Illinois.

That the Hardware stock of D. L. Barney, NUNDA, has been purchased by F. W. Covalt and the business will be continued at the old stand.

That John R. Young has purchased the Hardware stock of Richey, Duncan & Co., FLAT ROCK.

That Frank Sheik's Hardware store, at DURAND, was broken into by burglars on the morning of December 24, and $500 worth of goods and $50 in cash taken.

That Woodward & O'Brien is the name of a new Hardware firm at SHIPMAN.

That E. S. Young, WATSEKA, has sold his Hardware and Stove business to C. M. Bonham of RAUB, Ind. Mr. Bonham took possession January 1.

Indiana.

That F. V. B. Minnich's Hardware store, at GOSHEN, has been robbed of $600 worth of Cutlery.

That the firm of Zartman & Runkle, MACY, have sold their stock of Hardware to C. F. Oliver of ROCHESTER and R. L. Miller of MACY.

Iowa.

That MYSTIC has a new Hardware store, the proprietor of which is August Krum, a well-known citizen of that place.

That William Andrews, Hardware merchant of MONTROSE is moving his stock to new quarters.

That fire broke out in the Hardware store conducted by Mrs. C. M. Prader at MONTICELLO, on the 27th ult., and caused a loss of $4400.

That F. F. Jones, VILLISCA, retired from active management of his Hardware business January 1. He, however, still retains a half interest. Mr. Jones has accepted the position of cashier in the new Farmers' National Bank of VILLISCA. Henry Farlin and John Garside, employees of Mr. Jones, with Horace Farlin, a well known citizen of Villisca, have purchased the other half interest in Mr. Jones' business.

Minnesota.

That Owen O'Hara of LANESBORO has sold his stock of Hardware to Sorenson & Carlson, who took possession January 1.

Missouri.

That the Hardware business of McCullough & Co., MILAN, has been sold out to a new firm under the style of Turner & Winters.

That P. S. Howe and Alfred Jones have formed a partnership at GORIN, for the purpose of conducting the Hrdware business.

New York.

That Wells & Hubbard is the style of a firm which has succeeded to the business of E. R. Christman, deceased, PAVILION.

Price-Lists, Circulars, &c.

THE JANESVILLE HAY TOOL COMPANY, Janesville, Wis.: Hay Tools. An illustrated catalogue devoted to these goods shows the following Hay Carriers: Strickler's Reversible Dead Lock, the Boss, Rod and Cable, Strickler's Dead Lock Swivel, Boss Swivel, Strickler's Dead Lock Steel Track, and Reversible and Swivel Steel Track Combination Carrier. Illustrations are also given of Patent Steel Track.

FRANK L. JONES, Utica, N. Y.: Apparatus, Supplies and Specialties for cheese factories, creameries and dairies. An 1895 catalogue gives prices and descriptions of a varied line of these goods.

GIBBS MFG. COMPANY, Canton, Ohio: Hardware Specialties. An 1895 catalogue illustrates a full line of the company's goods, including Can Openers, Curry Combs, Garden and Lawn Rakes, Garden Trowels, Garden and Hand Weeders, Lawn Sprinklers, Nozzle Holder, Post Hole Diggers, Priming Shears and Wagon Jacks.

ASHTABULA TOOL COMPANY, Ashtabula, Ohio: Catalogue of Hay, Straw, Manure, Barley and Spading Forks. Forks for handling corn, vegetables, shavings, coke and coal; Garden and Mortar Hoes, Plain and Brace Steel Rakes, Malleable and Lawn Rakes, Weeding Hoes, Potato and Manure Hooks; also Post Hole Diggers, Garden Sets, Boys' Trowel Spades, and Fork, Rake and Hoe Handles.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

FURNACE SALESMAN, to handle complete line soft coal, hard coal and wood furnaces on salary or commission; good opportunity for first-class man. "Carbon," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

FOREMAN for pattern shop in a first-class stove establishment; one who is thoroughly conversant with the stove pattern business, and also up to date on gas stove construction. Address with full particulars, recommendations and salary required, "Pattern Shop," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

STOVE PLATE MOUNTER; one who understands the handling of men and is competent to take charge of a mounting department can hear of a good position by addressing "X. Z.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

A young man competent to figure on plans and specifications for builders' hardware, also to have knowledge of bookkeeping; German-American preferred. Rendtorff Bros., 154 North avenue, Chicago, Ill. Jan. 5

TRAVELING SALESMEN visiting the plumbing or tinning trade can add valuable side line to their business without interfering with same by addressing D. B. Hilton Company, 480 Clermont avenue, Brooklyn, N. Y. Jan. 5

By an old established tin plate and metal house, who are large manufacturers of tin plates, a thoroughly competent and reliable SALESMAN and MANAGER to represent them in New York City. Address, with references, "Tin Plate Manufacturer," care *The Metal Worker*, P. O. Box 521, New York City. Dec. 15

A first-class stove and furnace traveling SALESMAN for New England. Address, the Smith & Anthony Company, Boston, Mass. Dec. 29

A practical SALESMAN to travel the State of Pennsylvania for a stove foundry having a full line suitable for that State; one who can come well recommended with an established trade. Address, with salary desired, No. 1229, "Penn," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Dec. 29

A good, steady FORMER; used to drop machines in a large cornice and skylight shop in New York City. "N. Y. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 29

A first-class stove SALESMAN for Michigan and Ohio; address with references "Stoves," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 29

A large tinware manufacturing company want an "up to date" DIE and TOOL MAKER to take charge of machine shop; one who fully understands modern methods and is capable of improving on them. "Tinware," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 29

SITUATIONS WANTED.

By an able mechanic with business ability and a thorough knowledge of TIN and SHEET METAL WORK as done in job and contract shops, also experienced in steam and hot water heating; can draft plans in detail and estimate from architects' plans; am strictly temperate and reliable. J. P. Lisk, Palmyra, N. Y. Jan. 5

By a PLUMBER; 26 years of age; 10 years' experience at plumbing and gas fitting; can furnish good reference. J. T. Hanly, 27 Pleasant street, Canandaigua, N. Y. Jan. 5

By a young man of several years' experience, as inside, city or traveling salesman. R. L. Oram, 233 West 120th street, New York City. Jan. 5

By a young married man who is a good roofer, gutter and spout hanger; No. 1 furnace, range and heater hand; good general in and outside worker; can figure on furnaces and hot air work; will go to any part of the United States where a good man is wanted. Wm. Carrico, 1035 Milwaukee avenue, Chicago, Ill. Jan. 5

To represent a stove or stove and furnace manufacturer, as SALESMAN, at works or on the road; experienced in estimating and making contracts, taking care of established trade, selling and establishing new agencies, settling and collecting accounts; references furnished. "J. B. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

By March or April 1, by a man who understands ROOFING, SPOUTING and ASSORTMENT WORK; also a fair knowledge of furnace work; married, honest, sober and steady; position desired in a town of 3000 or 4000 in Ohio. "H. E. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

As PLUMBER'S HELPER; would like to finish trade; one and one-half years' experience. John Rourke, 32 Tailor street, Waterbury, Conn. Jan. 5

A steady situation by a thoroughly practical TINNER of 22 years' experience on inside or ou side work; job work of all kinds; understand pumps and windmill work in all branches; also first-class on repairing gasoline stoves and furnace work; can clerk in salesroom if required; sober and industrious; refer to Helme Bros. & Co., Kirksville, Mo. W. E. Davis, Kirksville, Mo. Jan. 5

By a PLUMBER; formerly in business; can furnish reference if required; sober; single; 28 years of age. Hugh M. O'Brien, 223 East One Hundredth street, New York City. Jan. 5

By a first-class TINSMITH, at inside and outside work and general jobbing; will go to any part of the United States. "K.," care H. Black, 162 West Twenty-fifth street, New York City. Jan. 5

By a first-class TIN and SHEET IRON WORKER, thoroughly familiar with furnace and hot air work, a steady job; can furnish unquestionable reference; no objection to the country. "G. H. T.," 108 Marcy avenue, Brooklyn, N. Y. Jan. 5

Permanent position desired by a practical PLUMBER, STEAM and HOT WATER FITTER; ten years' experience; strictly sober, and highest of references; country preferred. Chas. F. Dencklau, 119 Plainfield avenue, Plainfield, N. J. Jan. 5

As FOREMAN, by a first-class stove mounter; has held similar position for a number of years; best of references. "Mounter," 150 Mackinaw street, Buffalo, N. Y. Jan. 5

By a galvanizer of 30 years' experience, a situation as SUPERINTENDENT, or to build plants; can handle men to good advantage. "Spelter," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

By a practical FURNACE WORKER and JOBBER. "P. W.," Providence Post Office, R. I. Jan. 5

By a young married man, seven years' experience at pump, furnace, tin roofing, gutters, iron pipe work and jobbing; have also clerked in hardware store; best of reference "J. W. S.," Box 509, Southington, Conn. Jan. 5

By a practical STOVE PATTERN FITTER; 20 years' experience; best of references. "C. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

By a first-class TINSMITH and ROOFER; 20 years' experience. A. Shipman, 2332 Taylor street, Philadelphia, Pa. Jan. 5

By a first-class TIN ROOFER; can do sheet iron work. W. Clain, 1129 Titan street, Philadelphia, Pa. Jan. 5

By a first-class TIN and SHEET IRON WORKER; 12 years' experience; used to all kinds of jobbing; furnace and range work a specialty. "A. G.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

By a MACHINIST and ENGINEER; ten years' experience; best of references; single; willing to go any place where they will guarantee steady work. L. Z. Bond, Harrodsburg, Ky. Jan. 5

A tin plate SALESMAN who has had 15 years' experience, having been in the employ of two prominent tin plate firms both as salesman on the road and five years as manager of a Chicago branch, desires to make arrangements with a Pittsburgh or Western tin plate mill to represent them in Chicago and large adjacent cities, he having sold this trade in the past. "Tin Plate," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 5

Permanent position desired as TINNER, in good live town, by a man who has had 17 years' experience in the hardware, stove and tin business; can furnish good references as to workmanship, honesty, &c.; can do all kinds of tin work that comes in any ordinary shop, such as furnace work, roofing, spouting, making up general assortment and job work; 34 years of age; can clerk in store if wanted. "G. H. S.," Box 332, Madison, Lake County, Ohio. Jan. 5

Tin plate and sheet iron SALESMAN of experience and standing with the jobbing trade in and around New York is now open for an engagement. "New York," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

A young man with a practical knowledge of the furnace business, would accept a position with some first-class manufacturing company on the road; references furnished. Box 112, office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 29

Steady work by a first-class TIN, COPPER and SHEET IRON WORKER; sober; good reference; experience; city or country; wages no object. B. Maurer, 63 Willett street, New York City. Dec. 29

TIN and SHEET IRON WORKER, with 15 years' experience at inside and outside work, would like job in country. Henry Newburger, 212 Eldridge street, New York City. Dec. 29

A boy, 18 years of age, with six months' experience at tinning, desires position where he can finish trade; best of references; Eastern States preferred. G. K. Bashore, Port Royal, Pa. Dec. 29

By a young man, 20 years old, with three years' experience at plumbing and gas fitting; can wipe fair joint; also some knowledge of tin, sheet iron and range work. J. V. Martin, 716 Catharine street, Philadelphia, Pa. Dec. 29

As PLUMBER, by a young man who is a sober and industrious mechanic; ten years' experience. "T. J. J.," 4 Almira street, Bloomfield, N. J. Dec. 29

By a PLUMBER, at moderate wages. Arthur Wickers, 1466 Third avenue, New York City. Dec. 29

By a PLUMBER; city or country; moderate wages. H. F. Miller, 215 East Seventy-sixth street, New York City. Dec. 29

By a first class PLUMBER, at jobbing or new work. N. Schorbonnacher, 166 East 127th street, New York City. Dec. 29

By a CORNICE CUTTER. "Cornice Cutter," 20 Allison street, Cincinnati, Ohio. Dec. 29

As FOREMAN in some large factory making all kinds of tinware, wash boilers, &c., by a man who understands his business and has had charge of same for six years; can furnish the best of references; married; age 30 years; temperate; tinsmith by trade. A. S. Kiernan, 15 Willett street, New York City. Dec. 29

After first of year as TINNER, SLATER and FURNACEMAN; married; age 30 years; can give best of references. A. W. Smoots, Wadsworth, Ohio. Dec. 29

By a first-class TINNER and FURNACEMAN who has worked at the business for the past 15 years; can give estimates on all kinds of contract work, get out own patterns and take full charge of shop; must be a steady place where they can keep man by year; state wages. "Tinner," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 29

By a SOLDERER with over 20 years' experience on tin, brass and copper; can also work at machinery, steam fitting, &c.; would work for $6 a week until April; city or country. "Martin," care Joseph R. Brown, 72 Prince street, Brooklyn, N. Y. Dec. 29

Wishing to make a change in January, 1895, I am open for a position as FOUNDRY FOREMAN; can give good satisfaction on stove plate, bench or heater work; thoroughly posted on mixing and melting iron; full of push and energy; can handle men to advantage and always work for employer's interest. "Economical," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 29

By a SALESMAN, 29 years old, married; six years' experience in general hardware, tinware, stoves and building materials; temperate; wishes a position with a house handling similar lines; four years' experience in dry goods previous to entering the hardware business. "Ex-Postmaster," Adamsville, Pa. Dec. 29

By an A1 all round TIN, SHEET IRON, CORNICE and SKYLIGHT WORKER; can do raising, put up work, in fact make anything made out of sheet metal; 25 years' experience; fully competent to take charge of shop; am sober and industrious; willing to go anywhere on trial. "B. C. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 29

Tin plate and sheet iron SALESMAN of experience and standing with the trade will be open for an engagement January 1. "Tin Plate," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 29

MANAGER'S or BUYER'S position by man of large experience in hardware house furnishings, sheet iron and tin plate. "Manager," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 29

By a married man, as TRAVELING SALESMAN or CONTRACTING AGENT; have had ten years' experience in general hardware and farm machinery and wagons; can give best of references if desired. Lock Box 42, Prattsburgh, Steuben County, N. Y. Dec. 29

Special Notices.

WANTED.

A practical corniceman can make favorable lease of established shop Some capital and good references required Address "H. H.," office of *The Metal Worker*, 59 Dearborn St., Chicago.

WANTED.

A medium size Drop Press in good condition. Send full particulars. Address "DROP PRESS." office of *The Metal Worker*, 96-102 Reade Street, New York.

FOR SALE.

130 tons of Sheet Steel from a wrecked stand pipe, a large portion in good condition. Address

P. O. BOX 155,
Maryville, Mo.

WANTED.

8-inch Pipe Cutting Machine. Address, with full particulars and price,

E. C. TOWNSEND,
19 Broadway, New York City.

PATENT EAVE TROUGH HANGER FOR SALE.

A rare chance for roofing or tinners' supply manufacturing concern. Latest out. Best in the market. Good investment. Whole or royalty. For sample and further particulars address C. LUMM, Garrett, Indiana.

WANTED.

A second hand Circle Moulding Roller Machine; must be in good condition. Name price. Address

G. F. C. KLOEPPINGER,
130 Ottowa St., Toledo, O.

FOR SALE.

A No. 8 Sturtevant Blower, Countershaft and Pulley complete. This blower has been melting from 10 to 12 tons of iron per hour. Address

SCANLAN & CO.,
Louisville, Ky.

FOR SALE.

An old established Hardware, Plumbing and Tin business in one of the best towns in California Will invoice about $5000. Population 5000 and thickly settled surrounding country. Owner has made a small fortune in a few years and doing a good business at present. No shopworn stock. Best of reasons for selling will be given to inquirers. Address "PACIFIC," care *The Metal Worker*, P. O. Box 521, New York City.

WANTED.

Large manufacturing concern wishes to correspond with party who has a meritorious patented article in the iron, metal or wooden line, with a view of manufacturing it on royalty. Address, with full particulars,

"M. M. F. CO.,"
P. O. Box 330, Milwaukee, Wis.

Wanted To Buy.

A complete **SCREW PLANT** to manufacture all kinds of screws. Or we will buy a number of second-hand screw machines. Give prices and full particulars.

"M. M. F. CO.,"
P. O. Box 330, Milwaukee, Wis.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

Special Notices.

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,
Solicitors of Patents.

OFFICES:
PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row
WASHINGTON,
Atlantic Building, 928 F. St.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.
PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.
E. B. STOCKING, Attorney at Law
611 F ST., N. W., WASHINGTON, D. C.

KEUFFEL & ESSER CO.,

127 Fulton and 42 Ann Streets, NEW YORK.

Branches: 111 Madison Street, Chicago. 708 Locust Street, St. Louis.

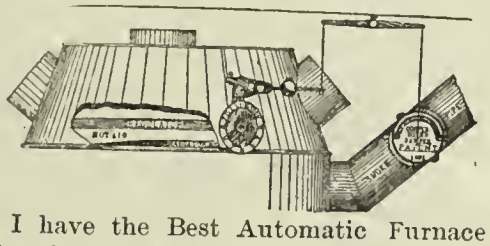
Drawing Materials AND Surveying Instruments.

Write for

Keuffel & Esser Co.'s Catalogue of 1895.

26th Edition.

Enlarged by over 100 pages. The most complete and reliable catalogue, representing the largest and most complete stock in this line.



I have the Best Automatic Furnace Regulator made up to the present time, and it is solid, durable and easy to put on. Damper with copper bearing. Wholesale and retail. Twelve years in use.

W. E. PUFFER,
8 PECK SLIP, NEW YORK.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

Special Notices.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

GOODWIN'S

Improved Book-keeping

AND

Business Manual

By J. H. GOODWIN.

Sixteenth edition; Forty-first Thousand; Four Thousand Testimonials; Richly bound in cloth, price, $3.00

"I find that your book contains many important points never brought out before in a work of its kind. I consider it invaluable to the fraternity of bookkeepers in general, and in particular to those who are connected with the offices of large mercantile houses."—W. H. RUSSELL, head bookkeeper for The H. B. Claflin Company, importers and jobbers of dry goods, New York City.

"Am following your directions and have lessened my labor *one-half*. I admire your system in every respect."—JAMES H. LOVELESS, bookkeeper for C. C. McCarthy, wholesale boots and shoes, Columbus, Ohio.

"Your book *far surpasses* my expectations, containing, as it does, so much valuable information."—CHAS. W. SIMMONS, with the Standard Oil Company, Cleveland, Ohio

"After a few days' study of your valuable work I changed my books from Single Entry (as they had been kept for 10 years) to your system of Double Entry, and am greatly pleased with it."—W. T. CHANDLER, general merchandise, Ash Grove, Mo.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher & Bookseller,

96-102 Reade Street, New York.

Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

JOSEPH C. KENT, President. **GEORGE DANBY, Sec'y and Treas.**

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. **SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.**

TRADE-MARK AMERICAN CLEANED.

PATENTED

LONGEST LEAVE TROUGH IN THE WORLD NOT WITHOUT A SEAM.

PRESSED STEEL BRICK

COMPLETE GALVANIZED

STEEL FRONTS

ROCK FACE BRICK AND STONE

CONDUCTOR

CORRUGATED IRON

NO SIR! YOU CAN'T SELL ME YOUR ROOFING! I AM USEING BERGER'S PATENT, IT IS THE BEST IN THE MARKET, AND YOU KNOW IT."

BERGER'S PATENT ROOFING

CRIMPED IRON

PLAIN ROUND

FIRE PROOF DOORS & SHUTTERS

METALLIC SHINGLES

CONDUCTOR

EXPANDING

PATENT CEILINGS

25 STYLES

CORNICES AND FINIALS

PERFECTION WATER CUT-OFF

PERFECTION WIRE HANGER

IMPERIAL STEEL HANGER

SKYLIGHTS

ALL STYLES

132 PAGE Catalogue ON APPLICATION.

WRITE FOR PRICES IT WILL PAY YOU.

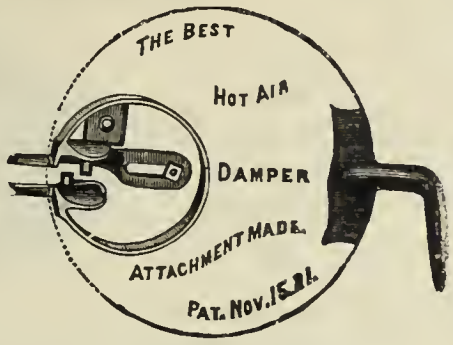
THE BERGER MFG. CO. CANTON, O.

IRON AWNINGS, ROOF PAINTS, WEATHER VANES, VENTILATORS, MALLEABLE IRON CRESTINGS, etc.

WESTERN AGENTS: ILLINOIS ROOFING & SUPPLY CO. CHICAGO, ILL.

Crown Damper and Crown Damper Attachment.





NICKEL PLATED HANDLE. PUT UP 1 DOZ. IN A BOX.

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

AMERICAN Dampers and Clips.

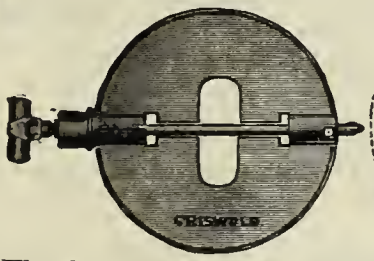
WAFFLE IRONS.
THE BEST



For Gas or Gasoline Stoves.

Easy to Clean, Long Wood Handles.

BUY *NO OTHER.*



Wood or Nickel Handle.

BEST SELLER.

ASK FOR THE **AMERICAN.**

Buy no Other.



JUST OUT.

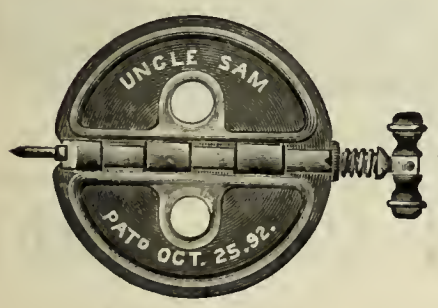
BEST CLIP MADE.

Send for Samples.

GRISWOLD MFG. CO.,

ERIE, PA.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers

At this time of the Year

metal workers are busy fixing furnaces, steam pipes, etc. Dixon's Graphite Pipe Joint Grease will make a better joint than red or white lead and parts can be separated easily even years after. When used on valves it does not harden or cause the valves to stick. Send for circular and sample.

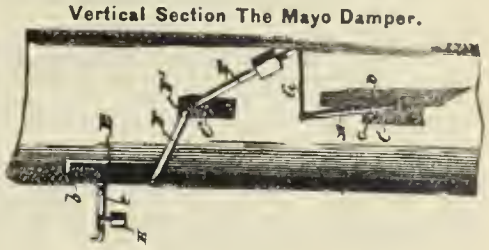
JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Agents Wanted

in every State and county at once for Patent Automatic Regulator and Damper for Stoves, Hot Air and Steam Heaters. Guaranteed to save 25 per cent. of coal.

MAYO, BECHTEL & CO.,
465 N. Franklin St., - Pottstown, Pa.

Vertical Section The Mayo Damper.



—AMERICAN LIFE AND MANNERS.—Paul Bourget has been a close observer of American life and manners, but he has not succeeded in catching everything in the scoop net of his observation. There are some scenes and incidents of daily occurrence in our public thoroughfares which might well have attracted his attention and been deemed worthy of detailed description. Here is one which he is at perfect liberty to incorporate in his picturesque and vivacious description of America:

Two teamsters meet in a team crowded thoroughfare and their wagons come into collision.

First Teamster: "I beg your pardon."

Second Teamster: "Pray, do not apologize, sir; the fault was mine."

F. T.: "I think not. I was certainly to blame."

S. T.: "You are too good, sir. Permit me to back out."

F. T.: "I couldn't think of it. It is clearly my duty to give you the right of way."

S. T.: "Such kindness, sir, is overpowering."

F. T.: "Don't mention it, sir, I beg."

With the assistance of a police officer they succeed in extricating their teams from their entanglement and pass on with mutual expressions of good will.

The writer is aware that there are persons, captious, carping, cranky and critical persons, who will take exception to the form in which the foregoing dialogue is presented, and maintain that the following is a better outline of the character the conversation is likely to assume on such an occasion:

First Teamster: —— —— ——!! —— —— ——!!! —— —— ——!!!!

Second Teamster: —— —— —— —— ——!!!!!

F [illegible]: —— —— —— —— —— —— ——!!!!!!

After order is restored the teams are taken in charge by the police and the teamsters sent to the hospital in an ambulance.

But the people who claim that the latter is the more correct report of the colloquy are those who can see no good in our national life and are constantly finding fault with existing conditions.—*The Press.*

— A BRIGHT WOMAN.— Miss Wilted: "How many birthdays have you passed?"

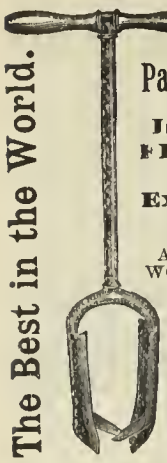
Miss May Ture: "I haven't passed any since I was 24; I let them pass me."

MORE THAN HIS MATCH.

Oh, he could do anything, he said,
For he was supple of limb,
And kept on himself a level head
And ever was full of vim,
But he met his match in a folding bed,
Which closed one night on him.

—*The Press.*

— ITS PRINCIPAL DRAWBACK —"The trouble wid the sympathetic sthroike," said Mr. Dolan, "is thot the sthroike most always lashts longer than the sympathy."—*Washington Star.*



The Best in the World.

IWAN'S

Pat. Improved Post Hole Auger

Is CONVENIENT and EFFECTIVE IN OPERATION.

Excellence of Material and Construction.

Awarded Medal and Diploma at the World's Columbian Exposition, 1893.

For sale by all leading jobbers in the U. S. and Canada.

IWAN BROS.,
SOLE MANUFACTURERS,
STREATOR, - ILL.



THE IDEAL
TEA AND COFFEE STRAINER

Affords absolute protection to the cloth.
Made in both Nickel and Silver Plate.
For prices and particulars address

THE IDEAL STRAINER CO.,
208 State St., Boston, Mass

Effect of Temperature on Masonry.

Every one, says the Glasgow *Herald*, is familiar with the influences of temperature on all metals, but few realize the fact that on such immense masonry dams as that by which the waters of Thirlmere Lake, in Cumberland, England, are impounded for the future use of Manchester, there is a measurable daily movement due to night and day temperature. Mr. Deacon, engineer of the Liverpool Water Works, has been making a long series of records in connection with the dam across the Vyrnwy Valley by which an artificial lake was made two or three years ago for the supply of Liverpool. He had a 4½-inch hole bored through the masonry about the middle of the dam, extending from the top right down to a tunnel which pierces the dam 80 feet from the crest. A fine steel wire was passed through this hole, a heavy weight attached, and a seismograph, connected with the bottom of the wire, making a continuous record on the plate glass, the motions of the dam being magnified four times for the greater ease in reading. The maximum motion yet recorded owing to a change of temperature is 0.0144 inch, or about $\frac{14}{1000}$ inch. The filling of the dam from a level of 13 feet causes a deflection of 0.034 inch, or $\frac{34}{1000}$ inch.

An Impossible House.

The man and his wife called on the architect, and the architect was glad to see them, for business was extremely dull.

"We want you to build a house for us," said the man, by way of introduction.

"Thanks," bowed the architect, "I shall be only too glad to do so, and I am quite sure that I can give entire satisfaction."

"Well, you ought to," remarked the lady; "we don't want much."

"What kind of a house did you wish?" inquired the architect.

"We want a good plain one of about eight rooms," explained the man, "and we will leave the design to you. All we expect is that when you have finished it it will suit my wife and myself. I mean on the inside; we are not so particular about the outside."

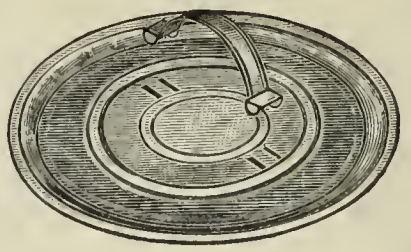
The architect heaved a deep sigh.

"I am very sorry, he said, "but you will have to go to some other architect. We can't design an impossible house in this office."—*Detroit Free Press.*

A Distinct Improvement!

THE BUFFALO POT COVERS

With Loose Attachable Handles.



With Loose Attachable Handles.

No woman likes a Pot Cover with a ring attached; she prefers a tin handle, but if the handles are soldered on the stock is an awkward one for the dealer and a dozen occupy as much room as a gross of the "Buffalo."

One dozen Covers and Handles packed in a neat pasteboard box, about an inch deep. Handles may be attached by any one instantly AS REQUIRED. Four slots, as shown in cut, are punched in cover, into which the tongues on the handles may be readily inserted and bent over on the under side, with the fingers, *securely* and *firmly* fastening the handle to the cover.

Make up an order from our catalogue (ask for one if you haven't one) and include a sample lot of these Covers.

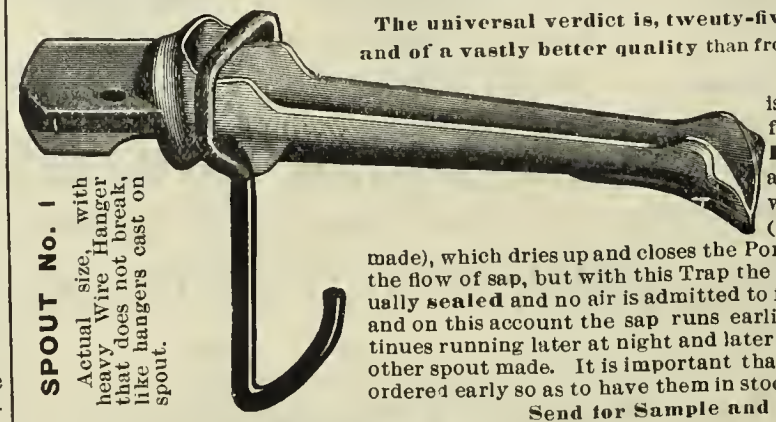
SOLE MANUFACTURERS, Sidney Shepard & Co., Buffalo and Chicago.

CHAS. W. WELLS, New England Sales Agent, 19 Pearl St., Boston, Mass.

1895 - POST'S - IMPROVED - EUREKAS,

THE SUGAR MAKER'S FIRST CHOICE.

The only Sap Spout made with a Self Sealing Air Trap, which greatly increases the flow of Sap.



SPOUT No. 1 — Actual size, with heavy Wire Hanger that does not break, like hangers cast on spout.

The universal verdict is, twenty-five per cent. more sugar and of a vastly better quality than from any other spout made.

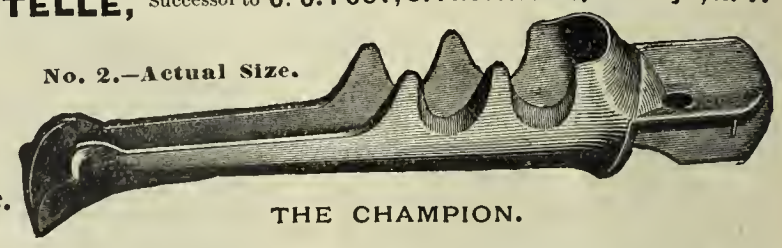
The **Patent Air Trap** is one of the essential features found only in the **Improved Eurekas,** and without which the air would be freely admitted (as it is in all other spouts made), which dries up and closes the Pores and materially lessen the flow of sap, but with this Trap the discharge hole is effectually **sealed** and no air is admitted to freeze or dry up the sap and on this account the sap runs earlier in the morning, continues running later at night and later in the season than any other spout made. It is important that these goods should be ordered early so as to have them in stock when the season opens.

Send for Sample and Circular,

CHARLES C. STELLE, Successor to C. C. POST, 81 Fifth Avenue, Brooklyn, N. Y.

Sold by the best Jobbing Houses.

No. 2.—Actual Size.



THE CHAMPION.

Rub! Rub! Rub!



Why permit your customers to continue in the old way of doing things, particularly the washing of clothes, when you can offer them a machine that will do the work in one-quarter the time, yet costing less than an outfit of common tubs boards, &c., would. To see the BOSS is to buy it. Send for descriptive circular and become acquainted with all its good features; it has no bad ones.

Tinned Nails and Red Cypress Wood ONLY used.

BOSS WASHING MACHINE CO., - 200 W. 3d St., Cincinnati, O.

The Improved White Mountain Freezer



"Excellent Cream!"

And frozen in **4** Minutes with the improved

White Mountain Freezer.

Positively the only freezer on the market having the **new double self-adjusting wood scraping bar** and famous **duplex dasher.**

FACTS are stubborn things.

The finest quality of cream produced in less than half the time required by any other freezer made.

Isn't **this fact** worthy of thorough investigation?

The **improved** "White Mountain" is sold by Leading Jobbers everywhere.

The White Mountain Freezer Co., = = Nashua, N. H.

THE PUBLISHERS
—OF THE—
ENCYCLOPÆDIC DICTIONARY
have decided for a short time to sell this work in four volumes at the further reduced price of $6.00 per set to insure a great introductory circulation

THE ENCYCLOPÆDIC DICTIONARY
contains 250,000 words exhaustively treated, consists of four cloth bound volumes, each nearly as large as Webster's Dictionary, and the whole containing 110,000 more words.

The work is new, authentic and reliable, and has no competitor among dictionaries of moderate price.

The full set is now ready for delivery, and orders will be filled promptly.

Expressage at the Expense of Purchaser.

DAVID WILLIAMS,
Publisher and Bookseller,
96-102 Reade St., New York.

For
1895
We respectfully solicit your orders for

Pieced Tin Ware,
Stamped Tin Ware,
Japanned Tin Ware,
Black Sheet Iron Ware,
Galvanized Sheet Iron Ware,
Enameled Ware,

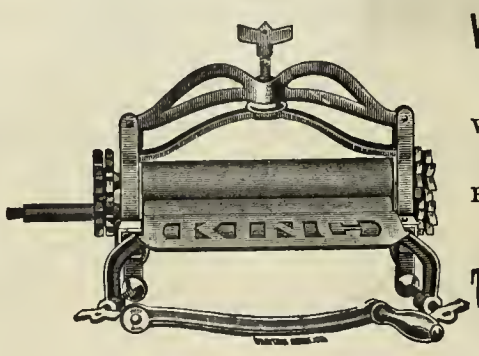
and guarantee satisfaction, both as to quality and prices.

Respectfully,

The Geuder & Paeschke Mfg. Co.
Manufacturers,
St. Paul Ave. and 15th St., Milwaukee, Wis.

DON'T PEEL POTATOES!
This is the Emancipation Proclamation that sells the
HENIS PRESS
Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils
NO MORE PEELING and POUNDING POTATOES.
IT PEELS AND MASHES WITH ONE STROKE.
A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.
Weight, 16 ounces. Length, 10 inches.
Can be sold in all seasons.
Write to Manufacturers for Prices.
WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.





We are Sole Manufacturers of the Celebrated Erie and King Wringers.
We also make all other brands of Wood and Iron Frame Wringers.
Exclusive sale of the ERIE and KING Wringers given to one dealer in each town.
Write for Catalogue:
The National Wringer Co., CANTON, OHIO.
New York Office, 107 Chambers St., John T. Ryan, Mgr.

ROCHESTER STAMPING WORKS, ROCHESTER, NEW YORK,



"ROCHESTER" RANGE KETTLE.
Patent Pending.

WANT **50,000** NAMES

To which they may addr. ss their

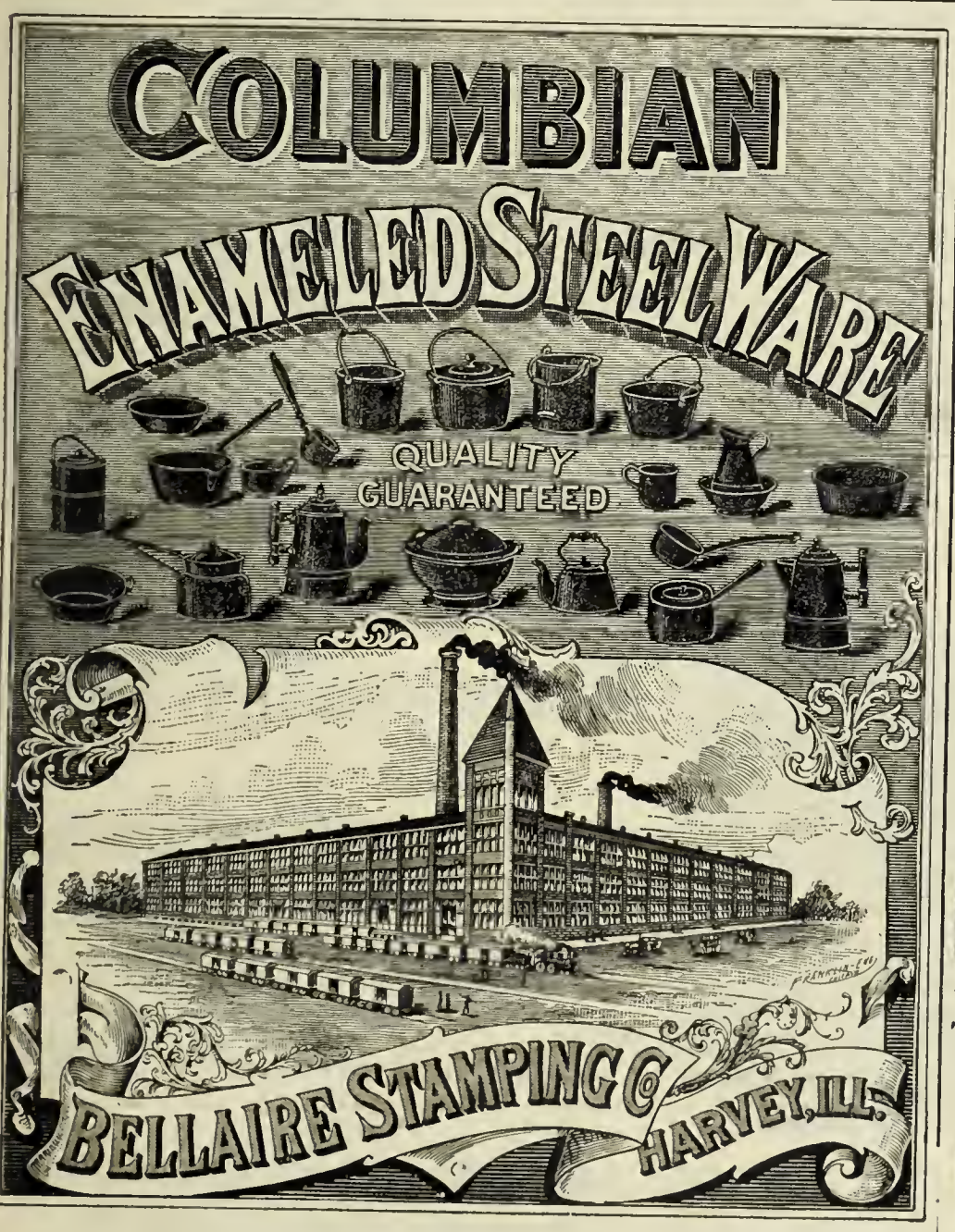
NEW CATALOGUE,

1894-1895.

No Goods Genuine without our Name.



"ROCHESTER" CUSPIDOR.
Patent Pending.





NEW YORK ELBOW CO..

18 Cliff St., N. Y. City.



Makers of
Elbows
AND
Roasters.



The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

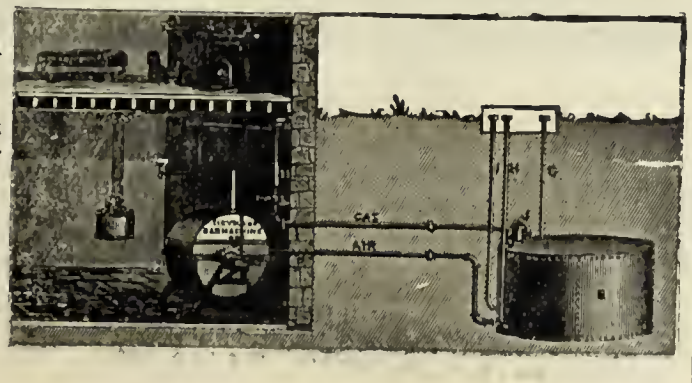
STAR MFG. CO., Canton, O,

CLEVELAND GAS MACHINE CO.

82 Champlain St.. Cleveland, Ohio.

Please send for] **Reduced Price** List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engives.



THE TRIUMPH COOKER,

WITH LOCK COVER.

STEAMLESS, ODORLESS AND NON BOIL-OVER.

THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.

A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.



THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD. CONN

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

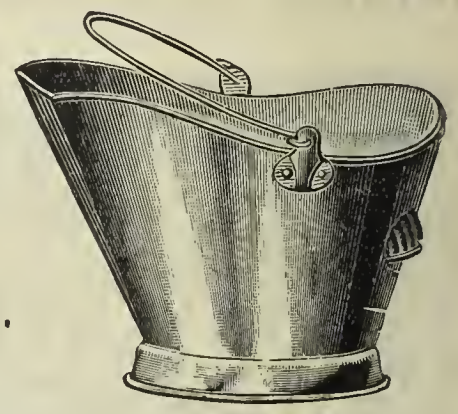
—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

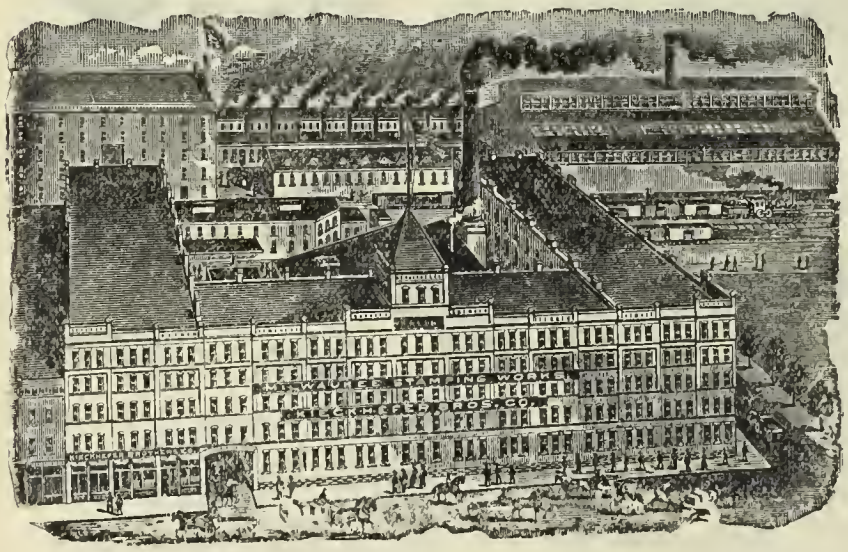


Agents for SPLENDID OIL COOKING STOVES and MAJESTIC OIL HEATING STOVES.

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

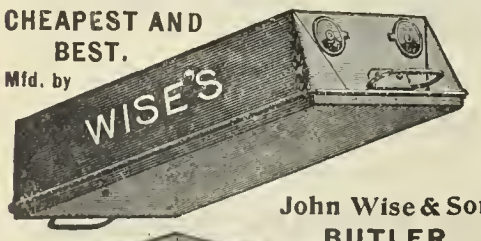
PLAIN, RETINNED, GALVANIZED, JAPANNED AND ENAMELED PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.

CHEAPEST AND BEST.
Mfd. by



John Wise & Son,
BUTLER, O.





LOOK HERE!

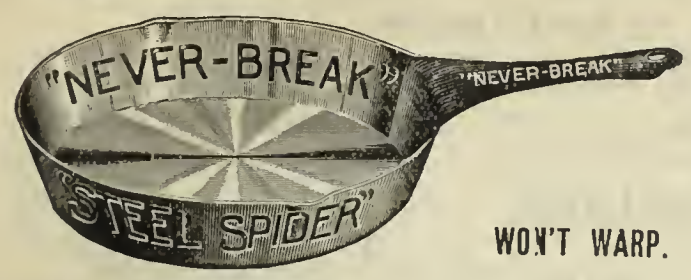
Hardware and Housefurnishing Dealers,

You want to sell the **"CRUSTY"** Bread Pan.

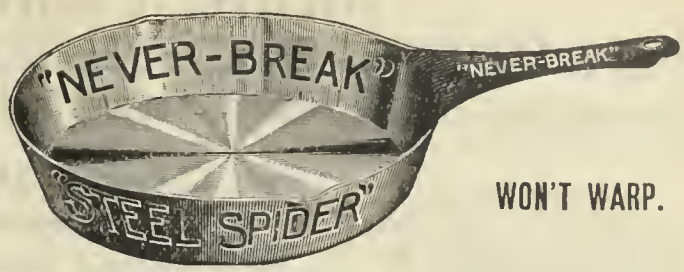
WHY? BECAUSE it's the most perfect Bread Baker ever made. It is indorsed by the leading cooking schools. Dealers should supply themselves at once. We are now advertising in the Household Journals of largest circulation, such as *The Ladies' Home Journal*, *The Delineator*, etc. You should prepare for the inquiries sure to come. Let us send you sample for 10c. to pay postage. Your order will follow. Made only by

THE NILES MFG. CO., - Niles, Ohio.

"NEVER-BREAK" STEEL HOLLOW WARE



WON'T WARP.



WON'T WARP.

STEEL SPIDERS, GRIDDLES, KETTLES, MASLINS, ETC.

Send for Catalogues of all our lines and Discounts.

THE STANDARD FOR WEIGHT, FINISH AND PRICE.

IMMEDIATE SHIPMENTS GUARANTEED.

The Bronson Supply Co., New York and Cleveland.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS.

Write us for Catalogue and Prices.



ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.



The "Jewel"

Tooth and Nail Brush Holder.

(Patented Feb. 6, 1894.)

THIS new and novel article fills a long-felt want for an attractive, durable and useful Tooth and Nail Brush Holder. It will hold any size brush, and, as each openin is numbered, the brushes are kept separate and there is no possibility of getting the wrong one. The ornamentation is lithographed on the surface, and it will not peel or wear off.

For sale by all first-class jobbers in House Furnishing Goods, Hardware, Druggist Sundries and Department Stores. Sample mailed on receipt of 15 cents.

KEEN & HAGERTY,

32 S. Calvert Street,

BALTO., MD.

— LORD COCKBURN, after a long stroll, sat down on a hillside beside a shepherd, and observed that the sheep selected the coldest situation for lying down. "Mac," said he, "I think if I were a sheep, I should certainly have preferred the other side of that hill." The shepherd answered: "Ay, my lord; but if you had been a sheep, ye would have had mair sense." And Lord Cockburn was never tired of relating the story and turning the laugh on himself.—*Tit-Bits.*

— JUDGE: "What's the charge against this prisoner, officer?"

Officer: "Didn't know he was loaded, your honor."—*Somerville Journal.*

— TEACHER: "Now, Wille, if your mamma promised you 10 cents and your papa 15 cents, how many would you have altogether?"

Wille: "The 10 cents mamma promised me."—*Chicago Inter-Ocean.*

NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**
BROOKLYN STOVE WORKS,
MANUFACTURERS OF
Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.
WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

You ought to.

A GREAT many merchants are using

Ladd's Discount Book.

Every day adds to the number of those who highly esteem this valuable work Very many people both in America and abroad have commended it highly as a time-saver and money-earner. It is positively

Accurate, Saving many times its cost in preventing errors.

Rapid, - - Saving much valuable time, and "Time is Money."

Practical, As proved by its constant use by those who would not now do without it.

The cost is small, the book will last for years, you can depend upon the results without proving.

A great many bright people are using LADD'S DISCOUNT BOOK, and

You ought to.

Regular Edition, $3.00 } Sent postpaid
Double Indexed, 4.00 } upon receipt of price by

DAVID WILLIAMS,
Publisher and Bookseller,
96-102 Reade Street, - New York

MARCY STOVE REPAIR CO.

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,
Agents of THE GLOBE VENTILATOR CO.,
74 Beekman Street, New York.
Foundry, 157 to 167 Imlay St., Brooklyn.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT
—OF—
TARBOX STOVE GLOSS
WILL DO A FINISHED JOB?



ALUMINUM

Ingots, Sheets, Rods, Tubes, Wire and Castings,
Cooking Utensils and Tableware,
Tea and Coffee Pots, Chafing Dishes, Rice Boilers, &c.
Write for New Catalogue.
THE WOHLER ALUMINUM COMPANY,
55 Jackson Street, - - - - Chicago, Ill

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

STOVE REPAIRS.

Our repairs are sure to fit, as they are made from manufacturers original patterns

MICA.

219 Locust St., St. Louis.

A. G. BRAUER.

LIVE IN JERUSALEM ?

It don't make any difference where you live ; we allow all freight charges on

RUTLAND STOVE LINING.

IT FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

"FIRESTONE"

Has proved I self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



Designers of national reputation. Superb mechanical facilities.

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

Self Lubricating



Rotary Screw Ventilators

For Smoky Chimneys, Poor Draught and Ventilation.

MANUFACTURED BY

E. G. Washburne & Co.,

46 Cortlandt St., N. Y.

Send for Price-List.

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

315 North 2d St., - - - Philadelphia.

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.

Established 1866.

EDWARD L. CALELY,

STOVE PATTERNS

TO ORDER.

945 Ridge Ave., PHILADELPHIA, PA.



THE DIAMOND THIMBLE IS THE BEST.

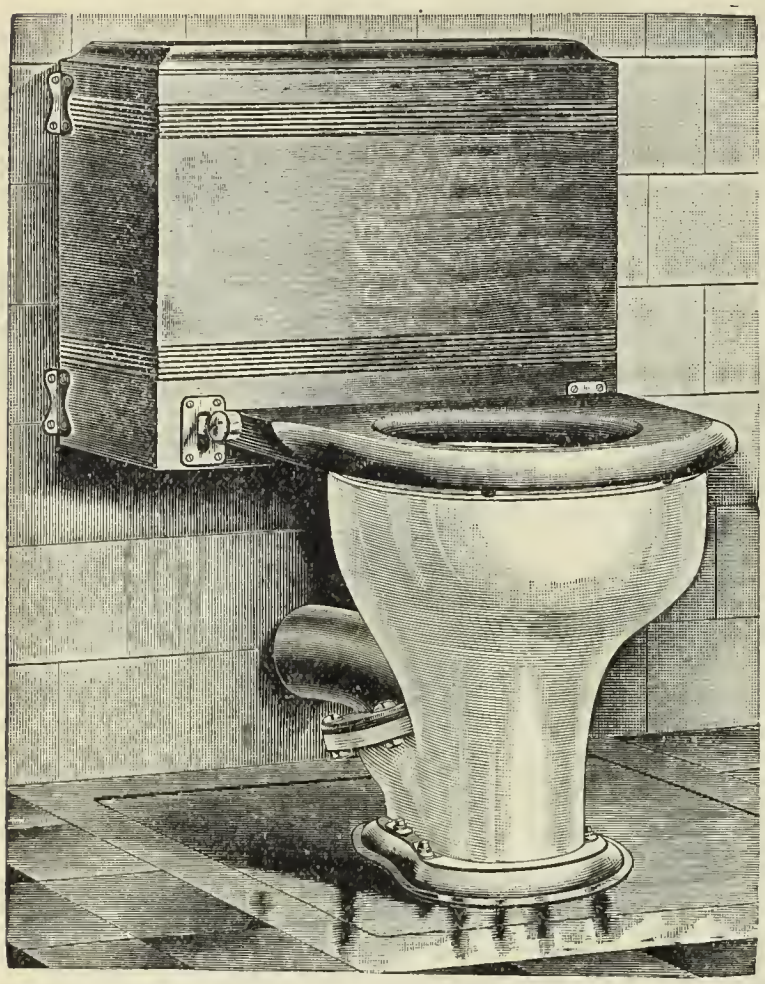
Manufactured by

S. CHENEY & SON

MANLIUS, N. Y.

PURITAN WASH DOWN WATER CLOSET.

Best Closet Yet Produced for Either Public Places or Private Houses.



In presenting this Water Closet Apparatus to Architects and Plumbers and those interested in Sanitary Plumbing, will say that our aim has been to **Improve the Quality, Simplify the Construction and Reduce the Cost of Fitting in Place**, and we feel confident that we have done all this in the present Apparatus, and more too, **as it will discharge more matter, keep cleaner with less water and make less noise in the operation** than any Water Closet Apparatus now on the market.

The Closet is especially well adapted for Fire Proof Structures, as the Soil Pipe may be run above the floor, either behind or on the face of the finish. Another very good feature—a stoppage can only take place in the bowl (where it can be reached from the top). Anything that passes this point will not lodge in the Soil Pipe.

These Closets are made of Vitreous Earthen Ware—that is, an absolutely non-absorbing material, warranted not to craze. Each Closet is stamped with a Bull's Head, our trade-mark.

The tank is provided with a cover finished to match. This cover deadens the noise, prevents fouling by dust and also prevents malicious persons from getting at or throwing anything into the tank.

The tank is worked either by hand action or seat action.

The distance from top of tank to finish of floor is 2 feet 6½ inches. From face of wall to front of Closet, 2 feet 1¾ inches. Depth of seal in Closet 2¾ inches.

SEND FOR CATALOGUE.

MANUFACTURED BY

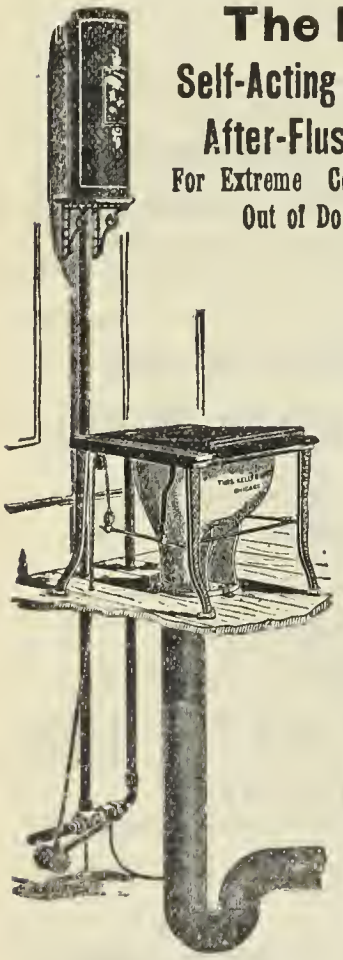
DALTON-INGERSOLL COMPANY

169-175 High St. & 55-61 Purchase St. (Ft. Hill Square),

BOSTON, MASS.

The Kelly Self-Acting Frost-Proof After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

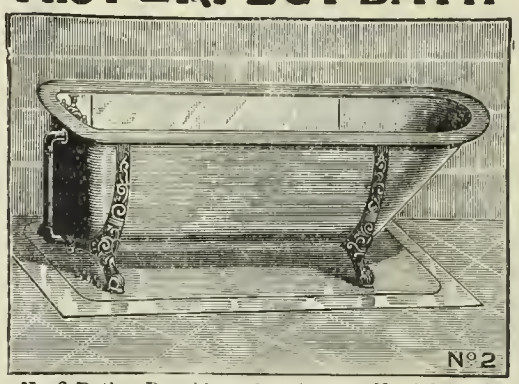
—SEND FOR CATALOGUE.—

Thomas Kelly & Bro.,

124 Franklin St., Chicago,

Manufacturers of Permanent Plumbing Goods

The PERFECT BATH



No. 2 Bath. Durable and sanitary as No. 1, but with less variety.

THE INDESTRUCTIBLE STEEL CLAD BATH.

INEXPENSIVE.

Common sense demands a sanitary bath, economy an inexpensive one, good taste one which can be decorated to harmonize with its surroundings. The **Steel Clad Bath** (copper lined) offers these advantages. It is also durable, and has, if desired, connected overflow and waste pipe. All metal except rim. No wood to harbor vermin or disease. Don't buy an imitation—get the **Steel Clad.** Send for catalogue.

For sale by all jobbers and plumbers and the

STEEL CLAD BATH CO. OF NEW YORK,

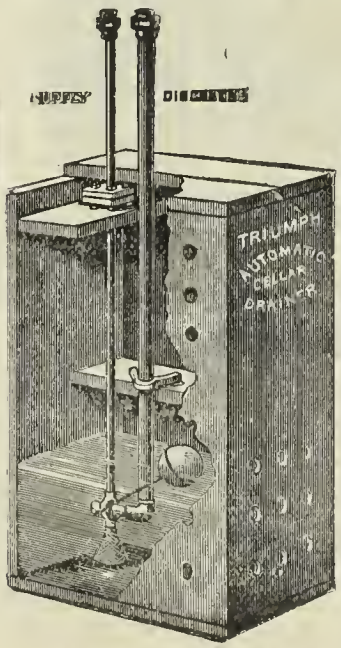
447 to 453 W. 26th St., New York City.

W. C. TRAGESER, President.

STEEL BATH MFG. CO.,

Detroit, Mich.

GEORGE BOOTH, President.



A SURE CURE

—FOR—

WET CELLARS.

The Triumph Automatic Cellar Drainer,

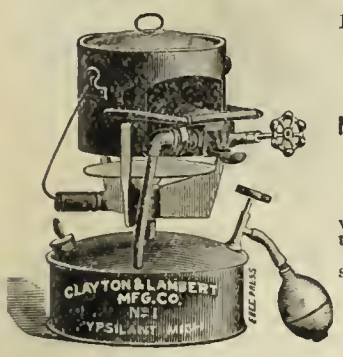
For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

FRIEDENWALD BROS.,

216 N. Holliday St., Baltimore, Md., Sole Mfrs.

Pat. May 19, '85. Pat. May 26, '85. Pat. July 14, '85. Pat. Aug. 8, '86. Pat. Nov. 23, '86.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

They will not blow out in the heavies wind, and will heat the heavlest irons faster than any man can use them.
Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

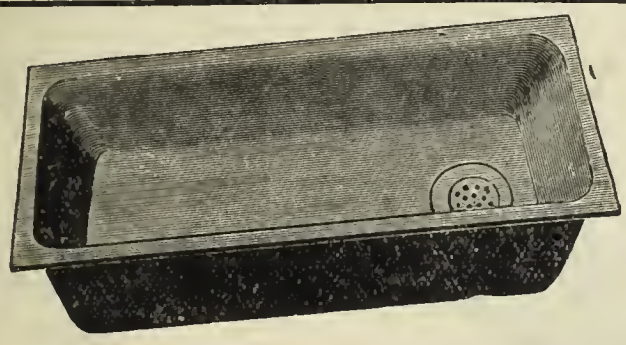
Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make, a knife and screwdriver being all the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust. Sold by Jobbers everywhere. Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,
30 Washington St., - Ypsilanti, Mich.



Columbus and New Era

Wrought .· Steel .· Sinks.

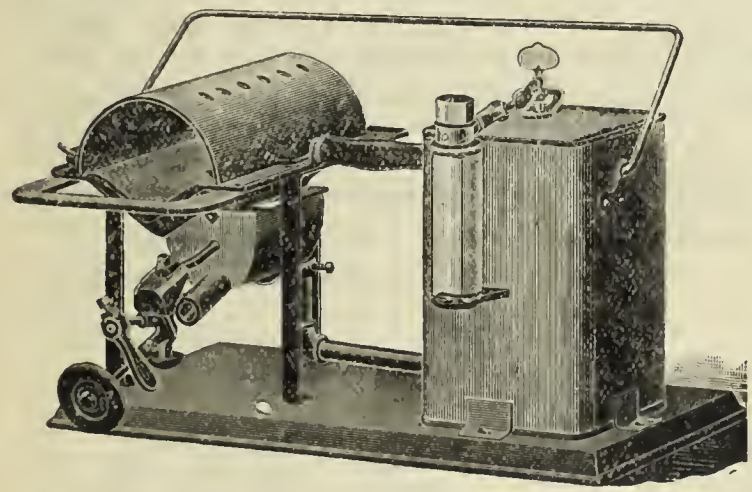


Both good, either the best. Cannot, will not break. In the end cheapest.

The Kilbourne & Jacobs Man'fg Co.,
Columbus, Ohio, U. S. A. Mfrs., write for Prices and Discounts.

Hull's No. 3 Bonanza Furnace.

FOR TINNERS ONLY.



Price, Heavy Tin Tank $6.00.
Price, Copper Tank, $7.00.
Price, Tin Tank and Bulb Pump $5.50.

Very convenient for Bench use. Hinged arch top. Tin or copper tank. My new Bonanza double burner strikes the coppers on both sides. Hottest fire ever produced from gasoline. Will heat largest coppers fast enough to use. My Rubber Air Pump, Handle or Bulb Pump, as may be desired. The strongest wind can t blow it out. One dollar off cash with order. Write for circulars.

M L. HULL,
Cleveland, - Ohio.



Covert Pants Stretcher.

THE Covert "Pants Streteher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Streteher cannot get out of order, and can be adjusted in the pants in a few seconds.

It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

MANUFACTURED ONLY BY

COVERT MFG. CO., West Troy, N. Y.





59 N. 2d STREET, - PHILADELPHIA, PA.



CHUCKS The National
All sizes and styles. Patented
Reversible Jaws. Illus. catalogue.
The standard Chuck since 1882
Address W. WHITLOCK,
39 Cortlandt Street, New York.

Principles and Practice of Plumbing.

By S. STEVENS HELLYER. With illustrations. 294 pages, price $1.25. Sent on receipt of price by

DAVID WILLIAMS, - Publisher & Bookseller,
96-102 Reade St., New York.

— IN THE SCHOOLROOM. — Teacher: "What is the largest city in the world?"

Scholar: "Chicago."

Teacher: "Oh, no; London is the largest."

Scholar: "I guess not, and I ought to know; we've got a Chicago drummer boarding at our house."—*Detroit Free Press.*

— JUDGE: "How do you account for the fact that the man's watch was found in your pocket?"

Prisoner: "Your Honor, life is made up of inexplicable mysteries, and I trust your honor will so instruct the jury."—*Puck.*

SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

43 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published

Sent, post-paid, on receipt of price, 25c.

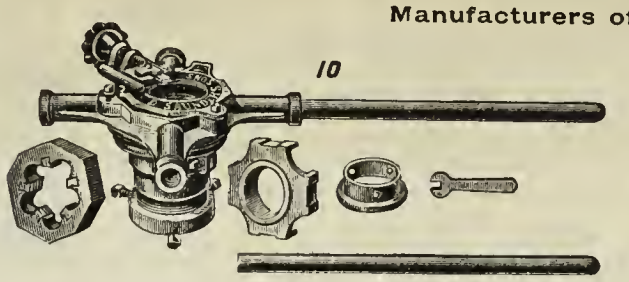
DAVID WILLIAMS,

PUBLISHER,

96-102 Reade St., New York.

D. SAUNDERS' SONS,

Manufacturers of





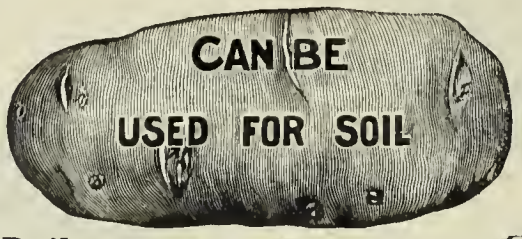
DIE-STOCKS AND VISES

FOR **LARGE PIPE.** These stocks have *CUTTING OFF ATTACHMENT,* and both Vises and Stocks are Malleable Iron. Light, strong and of superior design and finish; also *PIPE THREADING MACHINES* ¼" to 16", Tapping Machines, &c.

Send for Catalogue to

27 Atherton St., YONKERS, N. Y.

A RAW POTATO



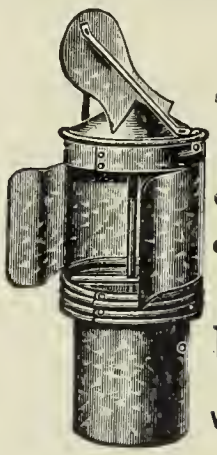
Up to Date Plumbers Use

Bailey-Farrell Mfg. Co.'s Prepared Soil and S. S. S. Solder.

Special Price for Trial Lots.

Pittsburgh, Pa.





REVOLVING CHIMNEY CAPS,

Galvanized Iron.

These Caps revolve on heavy glass bearings, and are made from No. 26 Iron. All sizes; cheapest and best.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets. Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted Leader, cheapest and best in the market. Sheet Iron Piping, Stove Pipe and Fittings of every description.

GENERAL GALVANIZING TO ORDER.

THE JERSEY CITY GALVANIZING CO., Manufacturers and Jobbers in

GALVANIZED MATERIAL OF EVERY DESCRIPTION.

Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE.

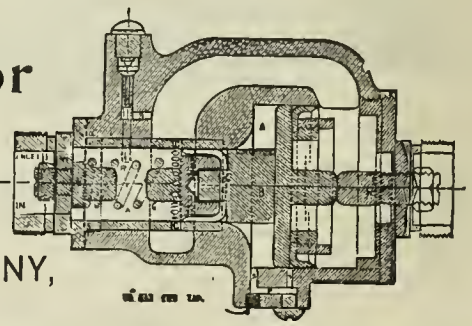
W. G. Taafel's

Pressure Regulator

PATENTED.

Send for Circulars, Price-Lists and Conditions for Placing.

NEWARK REGULATOR COMPANY,
Newark. Ohio.



ROOFING SLATE.

OUR BANGOR UNION, ALBION & MAMMOTH VEIN QUARRIES
PRODUCE THE FINEST SLATE IN PENNSYLVANIA & VERMONT

HAND SHAVED BANGOR SLATE BLACK BOARDS

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS

AULD & CONGER, 100 EUCLID AVE., CLEVELAND, OHIO.

Don't Buy

*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

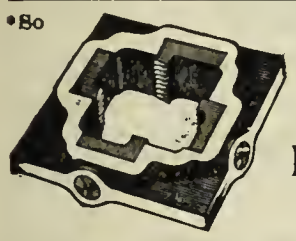
A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;

Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**

Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence of** quality.

If by chance you do not think these points, or the saving of money, objectionable,



Send us a Postal Note for 62 Cents (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, PA., U. S. A.
SEND FOR CATALOGUE OF THE "SKELETON" PIPE-DIE



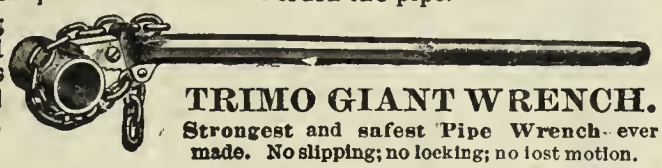
TRIMO PIPE WRENCH.

Forged Steel.

All Parts Interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

The chain holds securely; cannot fall out even if used upside down. Readily releases when desired. Solid forged head. Fine quality of tool steel. Interchangeable gripping jaws.



TRIMO GIANT WRENCH.
Strongest and safest Pipe Wrench ever made. No slipping; no locking; no lost motion.

TRIMO COMBINATION WRENCH. FOR NUTS AND PIPE.



TRIMONT MFG. CO., Roxbury, Mass,



The Climax Ratchet Stock

Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, $10.00.

No. 2 threads 1 to 2 in. pipe, takes 2½, 3 and 4 in. die, $17.00

For sale by leading jobbers.

Manufactured Solely By

C. M. KEMP MFG. CO.,
Baltimore.



DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.

The only Portable Folding Bathtub made; can be stored in space 2¼ x 2½ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discounts

MADE BY

THE DAY MFG. CO.
Detroit, Mich., U. S. A.



THE TRIPLE JET SYPHON Water Closet.

A Clean Fixture,
A Beautiful Fixture,
A Perfect Fixture,
A Sanitary Fixture,
A Durable Fixture.

Peck Bros. & Co.,

FINE SANITARY GOODS,

47 Cliff Street, New York
259 Wabash Avenue, Chicago.
65 Oliver Street, Boston.
127-37 Chestnut Street, New Haven, Conn.

LEATHER AND RUBBER

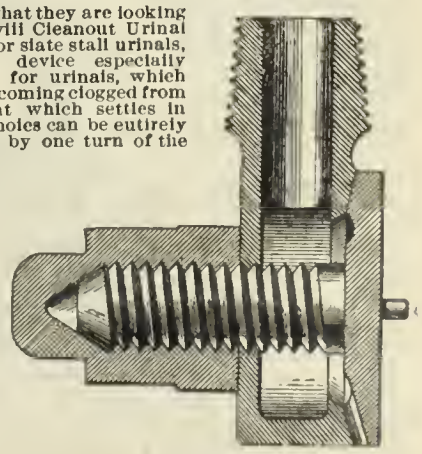
WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

Plumbers, Builders, Architects!

Just what they are looking for. Savill Cleanout Urinal Spray for slate stall urinals, a new device especially adapted for urinals, which upon becoming clogged from sediment which settles in tits or holes can be entirely cleaned by one turn of the nut.



(Patent applied for.)

FOR SALE BY

SAVILL, WALLS & CO.,
Dealers in Plumbers' Supplies,
1229 and 1231 Budden Street, - PHILADELPHIA.
Write for circulars.



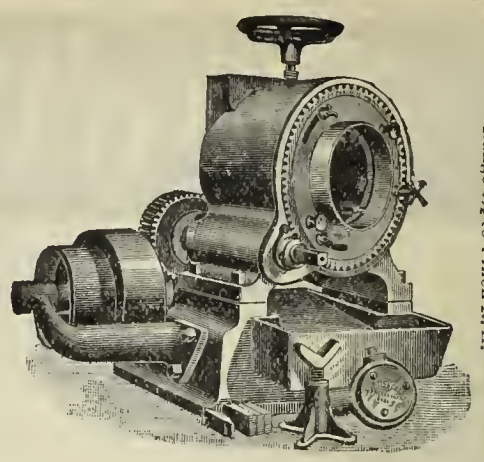
When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

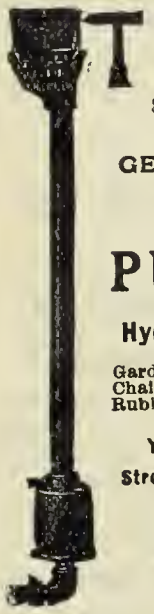
CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.



No. 2 Hand or Power Pipe Threading Machine. Range 2⅛ to 1 inch E. H.

W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON

156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,

Hydraulic Rams,



Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

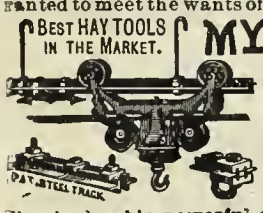
Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS' REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS



Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.

THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

8-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCK & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.

SIMS'S ADJUSTABLE EAVE TROUGH.



Pat. Jan. 14th, 1890.

Various Designs of Galvanized Sheet Steel Eave Troughs, Mitres, and Ridge Rolls, Roof Gutters, Expanding Conductors, Elbows, etc., etc.

THE SIMS MFG. CO., Sole Manufacturers, NEWARK, OHIO.



BERGER BROS.,

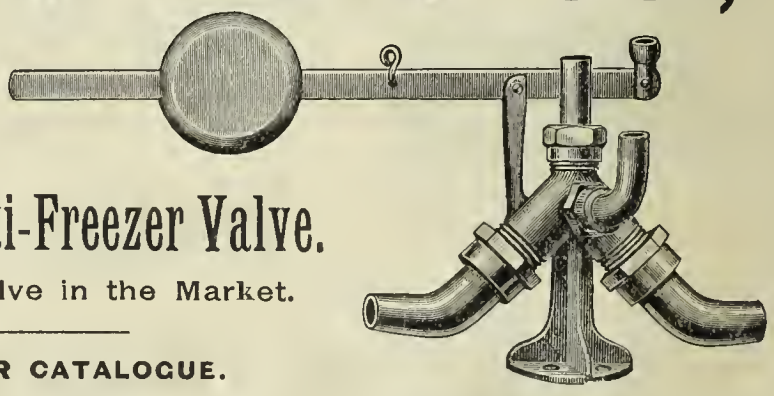
TINNERS' HARDWARE, ROOFERS' SUPPLIES,
231 AND 237 ARCH STREET, PHILADELPHIA.
GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,
LARGEST STOCK, GREATEST VARIETY, PROMPT SHIPMENTS.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Rods, Elbows, Ears, Handles, Valves and Plungers, etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.

ZERO VALVE CO.,

212 Seneca St.,
BUFFALO,
N. Y.



Vollmer Anti-Freezer Valve.

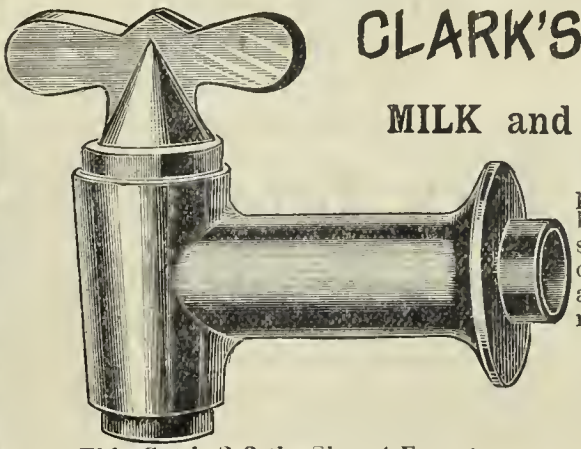
Cheapest Valve in the Market.

SEND FOR CATALOGUE.

CLARK'S NEW FAUCET

— FOR —

MILK and CREAM CANS, ETC.



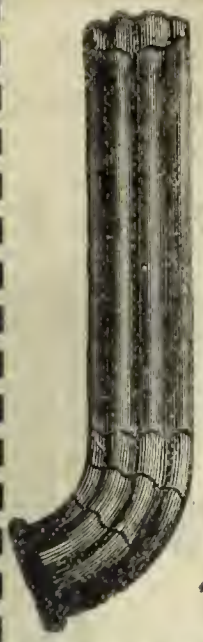
This Cut is 2-3 the Size of Faucet.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

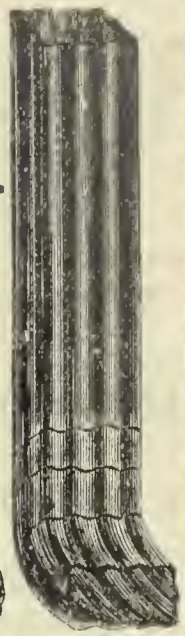
EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**







W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

☞ For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.

EAVE TROUGH

THE KANNEBERG ROOFING CO.,

CANTON, OHIO, U. S. A.

MANUFACTURERS OF

Patent Eave Trough and Hangers,
Conductor Pipe,
O. G. and Box Gutters,
Ridge Roll and Capping,
Ventilators,
Finials,
Cresting.

Patent Steel Roofing,*
Metallic Shingles,
Crimped, Beaded and Corrugated Steel,
Steel Weather-Boarding,
Sheet Steel Pressed Brick,
Mixed Roof Paint,
Building Paper, etc.†

* Write for sample.

† Get Illustrated Catalog.

CONDUCTOR Pipe.

BROUGHTON SELF-CLOSING

COCKS.

EVERY ONE WARRANTED.



Send for Circular.

E. STEBBINS MF'G CO., Sole Manufacturers.

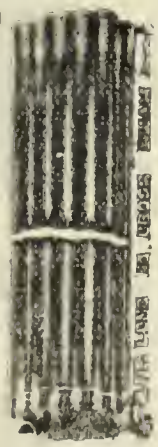
BRIGHTWOOD, MASS.

Corrugated Expanding Conductor



OF GALVANIZED IRON AND COLD ROLLED COPPER.





JAMES A. MILLER & BRO.,

129 and 131 South Clinton St.,

CHICAGO.

USE "OUR OWN" BASIN PLUGS.



No other lettering on them.

SAMPLE DOZEN ASSORTED $1.

HANDSOMELY NICKELED. BEST QUALITY STOCK



H. O. CANFIELD

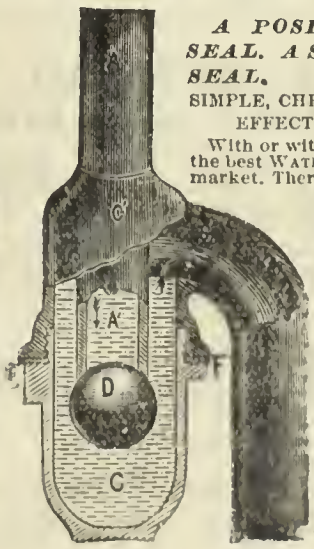
MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.

THE BOWER

SEWER GAS TRAP.



A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

SIMPLE, CHEAP.

EFFECTIVE and DURABLE.

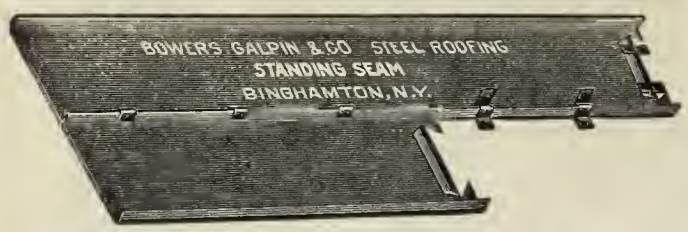
With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 48-page pamphlet sent free on application.

B. P. BOWER & CO.

Manufacturers,

Cleveland, Ohio

BOWERS, GALPIN & CO.



Standing Seam and Roll Roofing.
Painted Steel, Terne and Galvanized.

—MANUFACTURED BY—

BOWERS, GALPIN & CO., Binghamton, N. Y.

THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR

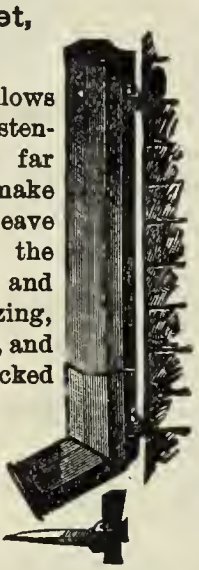
MANUFACTURED BY THE

S. S. S. CONDUCTOR CO.,

LIMITED

168 Lacock Street,

ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

Galvanized, Kalameined or Leaded.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.

PIPE THREADING AND CUTTING OFF MACHINES, WATER, GAS and STEAM FITTERS' TOOLS, Improved Hinged Vises, Pipe Wrenches, Stocks and Dies.



Acknowledged to be the Best.

ARMSTRONG MFG. CO.,

N. Y. OFFICE: 139 Centre St.

Bridgeport, Conn.

COLWELL LEAD COMPANY,

Centre St., and 681 Sixth Ave., Cor. 39th St., New York

Lead Pipe, Sheet Lead, Shot,

Plumbers', Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order

Eaves Trough Hangers.

Write for Circulars to

Proudman Bros.,

MERIDEN, - - - CONN.





STYLE S.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

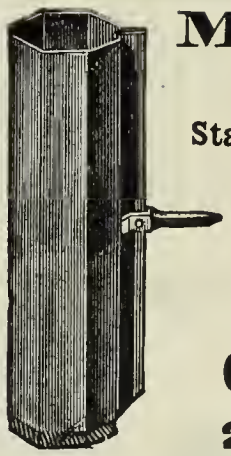
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,



(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

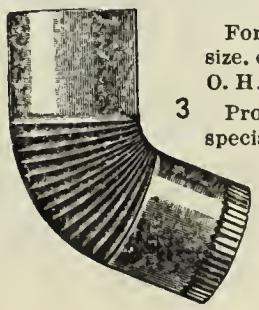
206 Robinson St., ALLEGHENY, PA.

The "O.H." One Piece

PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

(PATENTED OCT. 25, 1892.)



For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.



For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.

SPECIALTIES.

BRIGHT TIN PLATE.
GUMMEY'S ANTI-PINHOLE.
TERNE PLATE.
ALDERLY EXTRA QUALITY.
PENNSYL OLD METHOD, Treble Coated.
GILBERTSON'S OLD METHOD, Treble Coated.
Sheet Copper.—Brazier's Cold Rolled & Polished.
CRAIG SHEET STEEL.
COLD ROLLED SHEET IRON.
" " " SOFT STEEL.
CORRUGATED IRON.
" CONDUCTOR PIPE.
SPIRAL PIPE. REGISTERS.
ROOFING PAPER, No 9.— 500 Square Feet per Roll.
" " No 13.— 800 Square Feet per Roll.
ROOFING PAINT.
" TIN IN ROLLS.
100 Square Feet.
20 in. and 28 in. Wide.
Painted One Side.
ASBESTOS FIRE PROOF SHEATHING PAPER.
PECORA ROOFING CEMENT.
PLASTERING WIRE.

GUMMEY, SPERING & CO.,
PHILADELPHIA.

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD

Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,
535 to 547 West 15th Street, New York.

ÆTNA-STANDARD IRON & STEEL CO.

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk.
Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. BRIDGEPORT, OHIO.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also;

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

MAPLE SYRUP CAN and SAP BUCKET STOCK.

We are now prepared to quote for December and January shipment.

M. & L. A. OSBORN, - - - CLEVELAND O.

Gas-Lighting and Gas-Fitting,

—INCLUDING—

Specifications and Rules for Gas Piping, Notes on the Advantages of Gas for Cooking and Heating, and Useful Hints to Gas Consumers.

By WM. PAUL GERHARD.

A pocket-book for gas companies, gas engineers and gas fitters, for manufacturers of gas fixtures and dealers in gas appliances, for gas consumers, architects and builders, health officers and sanitary inspectors.

Second Edition, Rewritten and Enlarged.
16mo, boards, 50c.

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller
96-102 Reade Street, New York.

PHELPS, DODGE & CO.,

11 Cliff St., N. Y.

Tin Plate, Pig Tin, Sheet Iron, Sheet Zinc, &c.

PHELPS' TREBLE COATED ROOFING.

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS.** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade:

TIN AND IRON SHOW CARDS.

110 John St., - New York.

ALAN WOOD COMPANY,

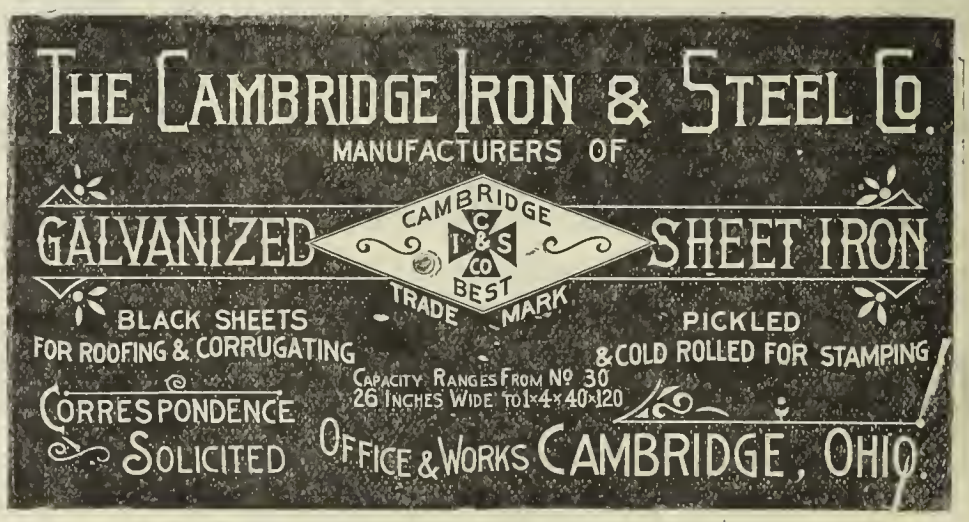
MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.



ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

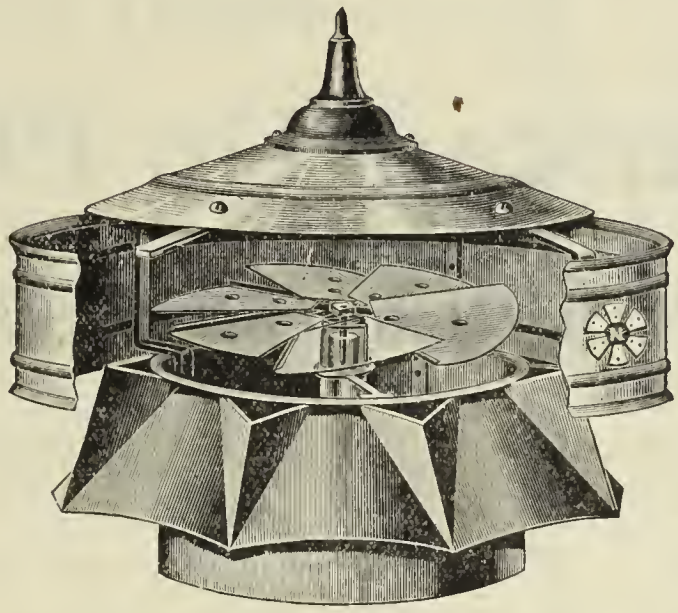
108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

THE **NASH** VENTILATOR.

REVOLVING,

DURABLE,

EFFICIENT.



DUST-PROOF,

NOISELESS,

Self-

Lubricating.

P. B. CALVERT & CO., - PHILADELPHIA.

—AGENTS:—

FITZ, DANA & CO., Boston, Mass.
MEURER BROS. CO., Brooklyn, N. Y
SIDNEY SHEPARD & CO., Buffalo, N. Y.
LYON, CONKLIN & CO., Baltimore, Md.
J. H. CHESLEY & CO., Washington, D. C.
J. M. & L. A. OSBORNE, Cleveland, Ohio.
KNISELEY BROS., Chicago, Ill.

JOHN DUNLAP COMPANY'S

SPECIAL BRAND ROOFING PLATES.

SUPERIOR GRADE.

I DUNLAP'S DOUBLE IPPED C

Or I X.

PALM OIL PROCESS.

EVERY BOX GUARANTEED. PITTSBURGH, PA.

NEW CASTLE

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

New Castle Steel and Tin Plate Co., New Castle, Pa.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices.

Brooklyn, N. Y.

PHILLIPS' ROOFING EXTRA HEAVY COATED. Guaranteed 35 Pound Coating.

"BOSTON" ROOFING. HEAVY SPANGLED TERNE. Guaranteed 20 Pound Coating.

NATIONAL (Dark) TERNES. (WORCESTER GRADE.) Guaranteed 10 Pound Coating.

THE PHILLIPS TIN PLATE CO., Philadelphia.

☞SEND FOR SAMPLE AND NEW TARIFF PRICES.

Light
AND
Medium Weight
GRAY IRON CASTINGS.

WE SOLICIT CORRESPONDENCE WITH THOSE WHO USE THE ABOVE.

★ We claim to have few equals and no superiors in quality.
★

We have unusual capacity.
Two seven-foot cupolas.

The Taylor & Boggis Fdy. Co.

523 Seneca St., Cleveland, O.

— "Do you read Dante?" asked the young man.

"No," replied Miss Flipleigh; "I really don't care for Italian chestnuts, you know."

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

——MANUFACTURERS OF——

SHEET METAL ROOFING, SIDING AND CEILING

——OF ALL DESCRIPTIONS FROM——

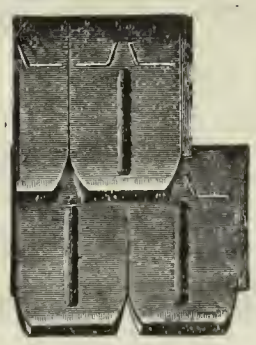
SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.
Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.
Factory, 113 to 133 Soulard Street, ST. LOUIS, MO.

THORN'S PATENT METALLIC ROOFING

TILES AND SPRING-LOCK SHINGLES.

THE BEST, MOST HANDSOME, DURABLE AND SECURE ROOFING PLATES YET OFFERED TO THE BUILDING TRADE.

Indorsed by All the Leading Architects.



Our system differs from all others in existence. We keep a complete stock of *eight designs of tile and two sizes of shingles.* Our tiles are a marvel of beauty and have the most secure and most practical side-lock ever invented.

Send for illustrated catalogue and circular.

THORN SHINGLE & ORNAMENT CO.,
1227 Callowhill St., Philadelphia, Pa.

Buy Plain and Corrugated Conductors and Single and Double Beaded Eave Troughs, all in 10 ft. lengths; also Brick Siding, Corrugated Roofing, Cornices, &c., of

ALLEN'S CORRUGATING WORKS,
422 and 424 W. Randolph St., CHICAGO, ILL.

Bright Charcoal Tin Plates.

Coke Tin Plates.

A Full Assortment of Sizes.

ALSO

20 x 28 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.		
IC	CLYRO—Old Way, Stamped and Squared.		
IC	M F Stamped and Squared.		
IC	PONTYMISTER—Old Style, Stamped and Squared.		
IC	KILLEY—Extra Coated, Stamped and Squared.		
IC	L P L—Extra Coated, Stamped and Squared.		
IC	LILY—Stamped and Squared.		
IC	DYFFRYN.	200 lbs.	PETREL.
IC	WORCESTER.	IC	ALYN.
200 lbs.	WORCESTER.	IC	BAAN.
IC	W T R—Stamped.	IC	MANSEL.
200 lbs.	W T R.	IC	ALBAN.
IC	P T L.	200 lbs.	ALBAN.
IC	DEAN	190 lbs.	ALBAN.
200 lbs.	DEAN.	200 lbs.	CAWDOR.
IC	PETREL.	190 lbs.	CAWDOR.

14 x 20 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F—Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	W T R—Stamped.
100 lbs.	W T R.
IC	P T L.
IC	DEAN.
100 lbs.	DEAN.
IC	PETREL.
100 lbs.	PETREL.
100 lbs.	CAWDOR.
IC	BAAN.

WASTER ROOFING.

ICW	20x28	GWERNEN.
ICW	"	W T R.
200 lbs. W	"	ALBAN.
190 lbs. W	"	ALBAN.
180 lbs. W	"	DYFFRYN.

SOLDER—The reduction in Pig Tin has made prices much lower.

RUSSIA SHEET IRON (Genuine)—The duty has been reduced, and prices are lower than last year. No. 8 to No. 16 inclusive, sheets 28x56 inches.

BRUCE & COOK,

190 Water St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

Standard Books

—ON—

FOUNDRY PRACTICE.

The Encyclopedia of Founding and Dictionary of Foundry Terms,

used in the practice of molding. Together with a description of the tools, mechanical appliances, materials, and methods employed to produce castings in all the useful metals and their alloys, including brass, bronze, steel, bell, iron and type founding, with many original mixtures of recognized value in the mechanic arts. Also aluminum, plating, gilding, silvering, dipping, lacquering, staining, bronzing, tinning, galvanizing, britannia-ware, German silver, nickel, soldering, brazing, ores, smelting, refining, assaying, etc. By SIMPSON BOLLAND, Author of "The Iron Founder," "The Iron Founder" Supplement. 12mo.: cloth.....**$3.00**

The Pattern Maker's Assistant

Embracing lathe work, branch work, core work, sweep work and practical gear constructions, the preparation and use of tools, together with a large collection of useful and valuable tables. Sixth edition. By JOSHUA ROSE, M. E.; illustrated with 250 engravings; 324 pages; cloth.....**$2.50**

Modern Molding and Pattern Making.

A practical treatise upon pattern shop and foundry work. By JOSEPH P. MULLIN, M.E.: 257 pages; cloth; illustrated. **$2.50**

Iron and Steel Founding.

Illustrated with 39 diagrams. By C. WYLIE. Second edition, revised and enlarged; 324 pages; 8vo; cloth... .....**$2**

The Practical Brass and Iron Founder's Guide.

A treatise on brass founding, molding, the metals and their alloys, etc. By JAMES LARKIN, late conductor of the brass foundry department in the Penn Works, Philadelphia. A new revised and greatly enlarged edition. Contents: Among the most important and entirely new sections of this edition of this valuable and popular book are the following: Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to Other Metals; Casting Iron and Other Metals Upon Lace, Emoroideries, Fern Leaves and Other Combustible Materials; Some Modern Bronzes. In one volume; 12mo; 400 pages.....**$2.50**

American Foundry Practice.

Treating of loam, dry sand and green sand molding, and containing a practical treatise upon the management of cupolas and the melting of iron. By THOMAS D. WEST, practical iron molder and foundry foreman. Fully illustrated. Eighth edition, revised. 408 pages; cloth.....**$2.50**

The Iron Founder.

A comprehensive treatise on the art of molding, including chapters on core-making, loam, dry sand and green sand molding, also crystallization, shrinkage and contraction of cast iron and a full explanation of the science of pressures in molds, added to which are formulas for mixtures of iron, tables, rules and miscellaneous information. By SIMPSON BOLLAND. Illustrated with over 300 engravings. 12mo, cloth....**$2.50**

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings, wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. illustrated with over 200 engravings; 400 pages; 12mo; cloth..... ...**$2.50**

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96-102 Reade St., - New York.

IS IT RIGHT?

Is it right to presume that the metal workers of America do not know the difference between common galvanized iron and good galvanized iron? We don't think so.

Would it be right to take advantage of that ignorance, even if it did exist? We don't think so.

Is it wise to conduct a business on that sort of a basis? We don't think so.

Taking advantage of other people's lack of expert knowledge is mighty poor business. Very few of us but have to take other people's words for things we are not wholly familiar with. Are we "fair game" for imposition because we depend on other folks' honesty? As a matter of fact, metal workers do know the difference between poor iron and good iron. They may be imposed upon once in a while because they believe in the dealer's honesty and do not watch him, but sooner or later they will find out the imposition, and then the dealer will be sure to lose their trade forever.

A dealer or manufacturer who sells inferior goods on the representation or with the understanding that they are first-class, is not a safe man to deal with. If he will sell a single sheet of iron that way, look out for him on a car load.

When we sell "Star Best Bloom," we guarantee it perfectly flat, full weight without variation, and absolutely true to gauge. It's the best grade of galvanized sheets we know how to procure. Doubtless, unscrupulous persons can occasionally sell inferior sheets at the price of the "Star." Doubtless they would make a little bigger profit on that one sale, but the big profits that result in lost trade are not so very profitable after all.

For a certainty of quality and an absolute guarantee of grades, address

MERCHANT & CO., Inc.,

PHILADELPHIA, CHICAGO, NEW YORK, BROOKLYN.

Hicks' Guide FOR Builders,

Comprising an easy, practical system of Estimating Materials and Labor for Carpenters, Contractors and Builders.

A comprehensive guide to those engaged in the various branches of the building trades.

By I. P. HICKS.

160 Pages, - 114 Illustrations.

Bound in Cloth, Price, - $1.00

This book presents to the trade, first, an easy, practical system of estimating materials, in concise form for reference. In the next place is given the average day's work of all kinds, and the average rates on which to figure in almost every detail of building construction.

Material and Labor, including Lumber, Carpentry Work Masonry, Plastering, Hardware, Painting, etc., are among the principal divisions These in turn are illustrated and ably treated under numerous sub-divisions, showing step by step the entire work of estimating, contracting and building, together with the best and most practical methods of doing the work.

This is followed by a section given to the Geometrical Measurements of Roof Surfaces with numerous illustrations and examples. It embraces a new and simple system of framing curved roofs, also the simplest methods of roof framing of every description, with practical examples thoroughly illustrating nearly every conceivable form of roof and showing many points never before presented.

The volume also contains a chapter on Mitering Planccers, Moldings, etc., illustrating and describing how to make, in an easy, practical manner, many joints which are the source of no little trouble and annoyance on the part of the workman.

SENT POST-PAID BY

DAVID WILLIAMS, Publisher and Bookseller,

98-102 Reade St., N. Y.

The Favorite Metal Shingle



EASTLAKE.

MONTROSS PATENT.

GOTHIC and DIAMOND TILE.

Unequaled for Beauty and Excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit, Mich.

MONTROSS METAL SHINGLE CO., Camden, N. J.

E. VAN NOORDEN & CO., Boston, Mass

BEWARE! OF INFRINGMENTS.

..Purchase only the..

Genuine Pressed Steel Brick.



PATENTED APRIL 5th 1887.

Corrugated Steel CEILINGS

CLUSTER STEEL SHINGLES.

ROLL STEEL ROOFING.

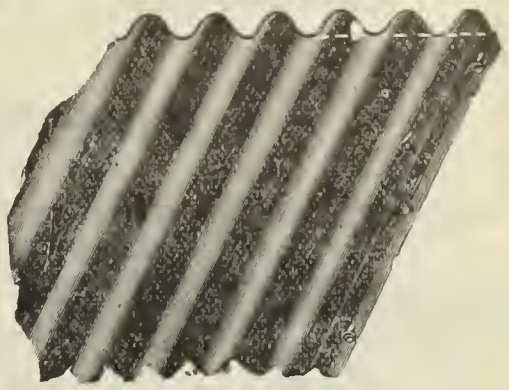
THE PENN IRON ROOFING AND CORRUGATING Co LIMITED.

For Catalogue, Samples and Prices. 23rd & HAMILTON Sts PHIL'A, PA. U.S.A.



Roof and Ridge Coverings

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

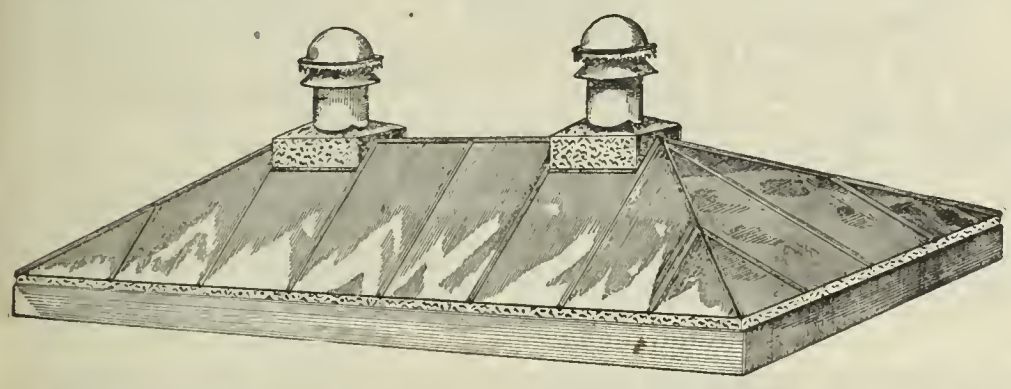


As made by us ready to put on, can be applied by any Roofer, Tinner, Carpenter or Builder, require no skilled or high-priced labor and when in position are guaranteed to be more durable and to give greater satisfaction than any other roofing material, at much less cost.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.

For Houses, Barns, Factories, Warehouses, Granaries, Sheds, Etc.



Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size. CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. **LITTLEFORD BROS.,** SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O

Send for a descriptive circular, with sample pages, of the METAL WORKER PATTERN BOOK. Even if you are not ready to buy, you want to know just what kind of book it is and how it would help in your work. DAVID WILLIAMS, Publisher, 96 - 102 Reade Street, New York.

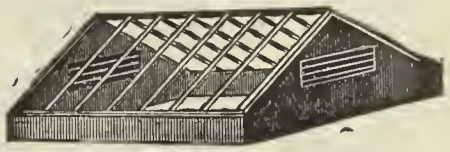
POWERS & BOYD

Galvanized Iron Cornice and Roofing Co.,

ST. LOUIS, MO.

Manufacturers of Copper and Galvanized Iron Cornices and Sheet Metal Trimmings for buildings. ESTIMATES FURNISHED ON APPLICATION.

RASNER & DINGER



Manufacturers of HAYES' PATENT

Metallic Sky-Lights,

Galvanized Iron Cornices and all kinds of Architectural Sheet Metal Work, Tin and Iron Roofers.

Second Ave. & Ferry St., Pittsburgh, Pa.



A Rat Completed the Circuit.

A singular accident, which occurred recently at an electric light plant in Baltimore, is thus described in a press report from that city: A rat played hob with the Brush Electric Light Works late on Thursday night. At the time the employees were unable to find the trouble. About midnight the lights went out at one station of the city. At the same time the switchboard and the connecting wires in the works were ablaze, and when the display ended the entire board was a wreck. It was not until after an investigation that the explanation presented itself. The rat, in skipping along from one brass terminal to another of an entire circuit of lights, had made a connection and circuit between wires that were intended to be kept apart. Each one of the brass fixtures was connected with two wires charged with opposite kinds of electricity. The rat had his hind feet on one fixture, and when his front feet touched the brass 2700 volts of electricity passed through his body, a sufficient voltage to produce 1000 horsepower. The rat was wet, and the body became rigid as if frozen in the act of stepping across from one brass piece to another. The remains of the rat are preserved at the works. So lifelike is the attitude of the rat that at a little distance one would think it a live rat in the act of jumping.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.

AMERICAN ROOFING CO.,

Mention this paper. ST. LOUIS and CINCINNATI.



The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S.
FIRST & WASHINGTON STS. JERSEY CITY, N.J.

James A. Miller & Bro.,

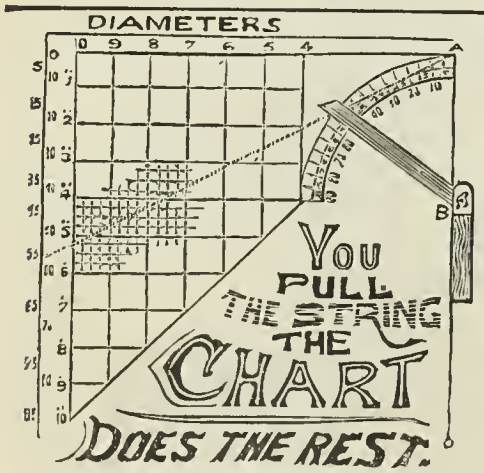
129 and 131 South Clinton St.,
CHICAGO,
MANUFACTURERS,



FOR

ROOFING AND SIDING.

Send for Circular and Prices.



ELBOW PATTERN CHARTS.

Quick method. Easy to learn. Good to have. Over 1000 sold. 50c. by mail.

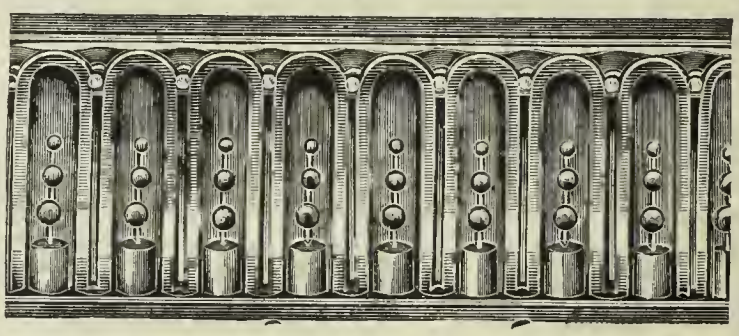
A. L. BURTIS, Lockport, N. Y.

— OFFICE SEEKER: "Mr. President, don't you remember me?"

President: "Yes, but I cannot place you."—*Truth.*

Friedley & Voshardt,

194 and 196 Mather St., Chicago, Ill.,



MANUFACTURERS OF

Sheet Metal, Zinc and Copper Ornaments

For Interior and Exterior Work, Steel Ceilings, Statuary, &c.

Send for our new 1894 Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.

You can get everything in the line of Sheet Metal Goods from us.

PRICES WAY DOWN.

Steel Roofing, Corrugated Iron.

Galvanized Steel Eave Trough, Corrugated Expanding Conductor, Galvanized Cornice, Ornamental Crestings, Finials, Etc.

DOWN! DOWN! GO PRICES. WRITE US QUICK.

J. H. ELLER & CO., Office, 194 E. Fifth St., CANTON, OHIO.

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.

THE CANTON STEEL ROOFING Co.

CANTON, OHIO.

MFGRS OF TIN PLATE, GALVANIZED IRON. PAINTS etc.

Best Quality Standing Seam, Corrugated and Crimped STEEL ROOFING AND SIDING.

WRITE FOR OUR 1894 CATALOGUE, PRICES etc.

EAVES TROUGH, CONDUCTOR PIPE HANGERS etc.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.

HOLTON IRON ROOFING CO.

ROOFING, SIDING, CEILING &c.

NEW LISBON, O.

AGENTS WANTED EVERYWHERE

SLIP JOINT EAVE TROUGH 10 FT 2½ IN LONG

FOSTORIA STEEL ROOFING CO.

CORRUGATED IRON

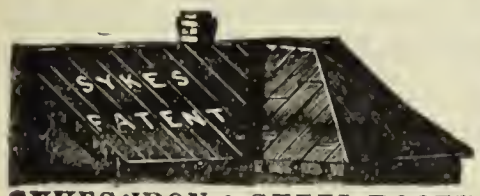
Fostoria Ohio

CLAPBOARD SIDING

THREE STYLES STEEL ROOFING

SELF LOCKING

WATER CUT OFF



WORLD'S FAIR AWARD.

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., • Chicago and Niles, O.



COLUMBIA ROOFING.

HAIL! COLUMBIA BEST OF ROOFING!
HOLD AN AGENCY FOR ME.
CLEAR THE TRACK, FOR I AM COMING;
SEE ME GET THERE! WATCH ME! SEE

FOR PRICES AND TERMS

THE COLUMBIA ROOFING CO.

CANTON, OHIO.

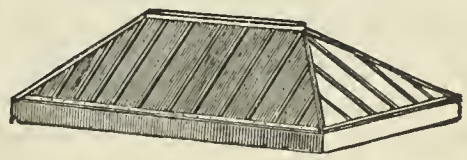
JAMES A. MILLER & BRO.

129 and 131 So. Clinton St.,

CHICAGO.

MANUFACTURERS OF

Sheet Metal Skylights.



The amount of skylight work we did for the World's Fair (over 600,000 sq. ft.) required us to so increase our facilities for such work that we have cheapened the cost materially, and we will be particularly pleased to quote prices for large or small skylight work, "knocked down" or put together, as preferred.

THE NEW TARIFF ON TIN

Enables us to **Reduce** the price of our

Metal Slates and Victoria Shingles.

Quotations based on the new duty furnished on request, and samples sent free if desired.

Cortright Metal Roofing Co.,

Broad and Hamilton Sts., Philada., Pa.
134 Van Buren St., Chicago, Ill.

DUGAN'S PATENT

SNOW GUARDS FOR SLATE AND OTHER SLANTING ROOFS

SEND FOR ILLUSTRATED CIRCULAR & PRICE LIST.

M. HALLIDAY,
SOLE PROPRIETOR AND MANUFACTURER.

218 EAST NINTH STREET, NEW YORK.

JOHN SANBORN,

Dealer in Metals,

and manufacturer of Refined Metal Solder Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead

217 WATER STREET,

Near Beekman Street, NEW YORK

THE ROOT & BARRON

ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer,
PALMYRA, NEW YORK.

JOHN D. EMACK,

Roofing Slate,

SLATE BLACK-BOARDS.

Betz Building, Philadelphia, Pa.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York.

Manufacture every size and kind of Black, Tinned Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools all Kinds

USEFUL BOOKS.

Sheet Metal Worker's Instructor.

By R. H. WARN; illustrated by 32 plates and 37 woodcuts; 178 pages: 8vo, cloth, ...$3

The Tinman's Manual and Builder's and Mechanic's Handbook.

By J. R. BUTTS; 9th edition; illustrated; 204 pages; 12mo, cloth $1.25

The Tinsmith's Helper and Pattern Book.

With Useful Rules, Tables and Diagrams used by the Fraternity. By H. K. VOSBURGH; limp cloth.....$1

Workshop Companion.

By JOHN PHIN; 164 pages, 4⅛ x 6¼ inches; boards, $0.30; also cloth, $0.60

The English and American Mechanic.

An every-day hand book for the work shop and the factory. Containing several thousand receipts, rules and tables, indispensable to the mechanic the artisan and the manufacturer. A new, revised, enlarged and improved edition. Edited by EMORY EDWARDS, M. E.; 12mo, cloth.....$2

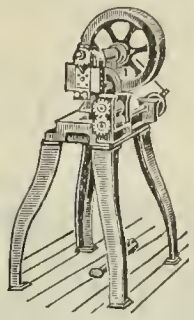
Sent, post-paid, on receipt of price by

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade St., New York

The Toledo Machine & Tool Co.,



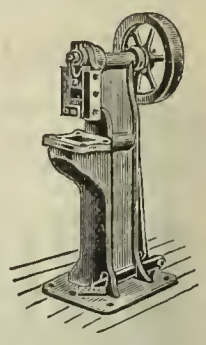
MANUFACTURERS OF

Power Punching Presses, Drop Presses, Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses, Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

Send for Catalogue now being Printed.

THE TOLEDO MACHINE & TOOL CO.,

Superior and Oak Sts., Toledo, O.



PATENT AUTOMATIC CAN BODY

SEAMERS.

COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.

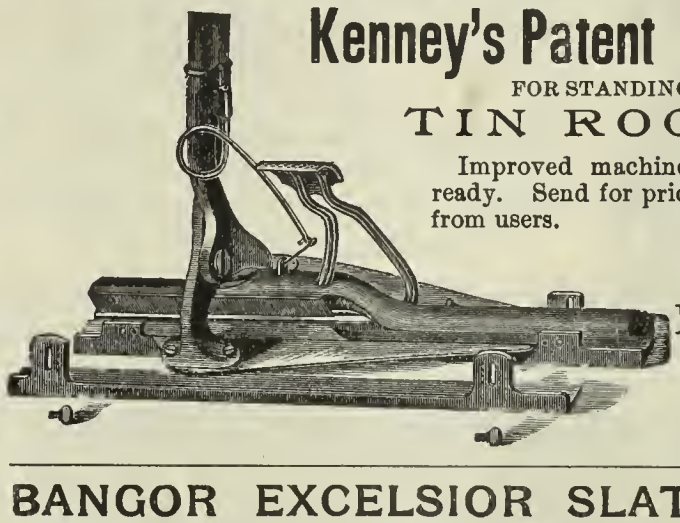
218 New St.,

W. J. GORDON, PHILADELPHIA, PA.

Kenney's Patent Double Seamer

FOR STANDING LOCK

TIN ROOFING.



Improved machine, from new patterns, now ready. Send for prices and flattering testimonials from users.

MANUFACTURED BY

Dwight Slate Machine Co.,

Hartford, Conn.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, • • EASTON, PA.

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC.

QUARRIES, BANGOR, PA.

NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE

Kitchen Sinks,
Laundry Tubs,
Washstand Tops,
Marbleized Shelves,
Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also **Mantels.**

FAIRHAVEN, VERMONT

SEND FOR CATALOGUE.

RISING & NELSON,

WEST PAWLET, VT.

MANUFACTURERS OF

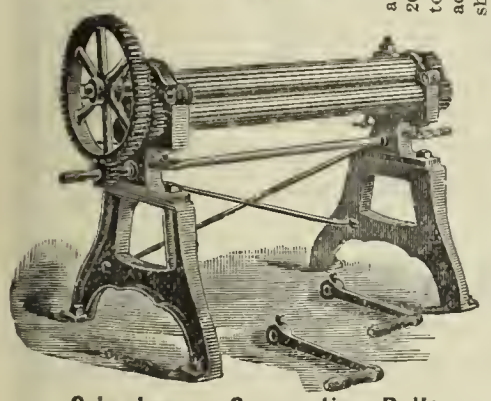
RED and GREEN ROOFING SLATE.

Wholesale Dealers in all kinds of Roofing Slate.

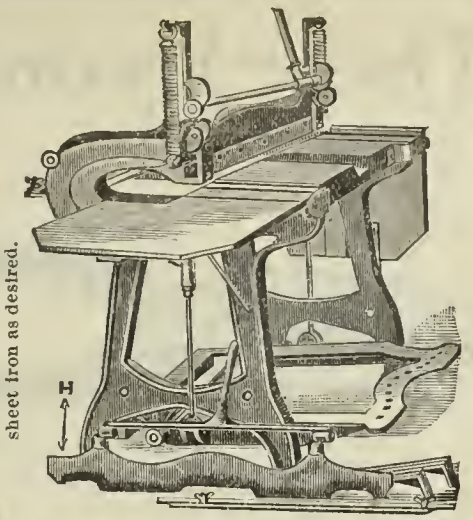
CORRESPONDENCE SOLICITED.



Improved Pat. Combined Punch and Stock Shears. (7) different sizes, from 200 to 1000 lbs., for light or heavy work; 6 to 15 in. throat punch. A general purpose tool adapted for punching and cutting bar and sheet iron as desired.



Crimping or Corrugating Rolls.
Are made in different sizes with fine or coarse corrugations, also designed for curving if desired.



New General Purpose Gap Shears,

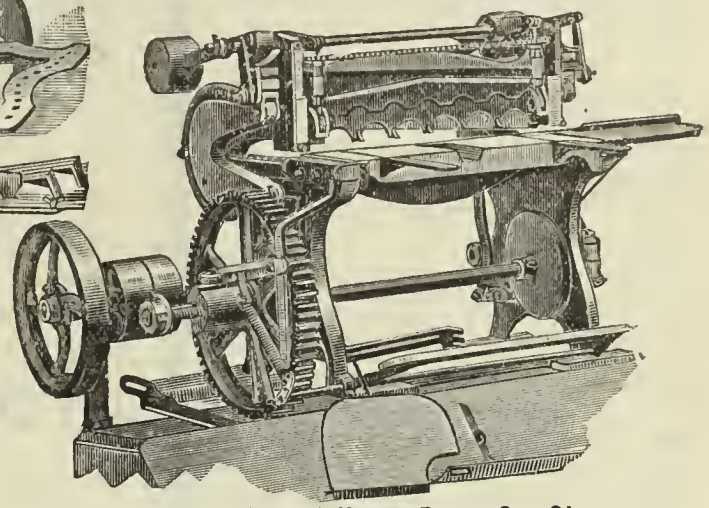
12, 15 or 18 in. throat, for slitting wide sheets as desired and regardless of length. Are made in suitable sizes for light or heavy work. With the Patent Lever Attachment can cut up to No. 16 and 14 gauge. Three different style Squaring and Slitting Shears, also Plain Square Shears all sizes up to 10½ feet long.

BEWARE OF INFRINGEMENTS.

THESE TOOLS ARE MADE BY

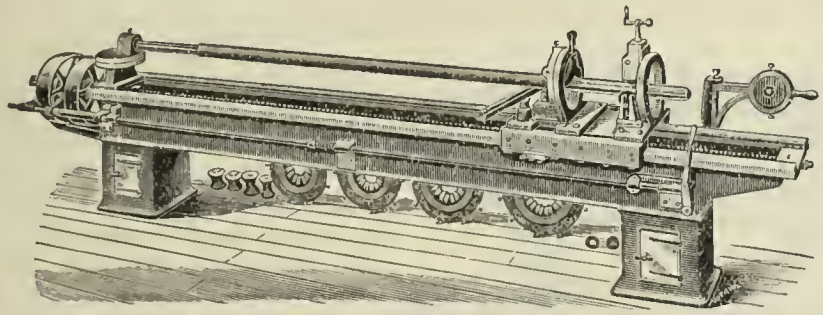
BERTSCH & CO.,

Cambridge City, Ind.



Improved Light and Heavy Power Gap Shear.
12 to 21 inch throat, for slitting wide sheets. (4) different styles and (8 different lengths up to 10½ feet long to cut No. 8 and lighter. Special design to cut 3-16 inch to ⅛ inch plates. Are provided with Automatic Hold-down, Automatic Clutch and Patent Drop-leaf Tables with Trimming Gauge.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

TINNERS' MACHINERY AND SUPPLY CO.,
SUCCESSORS TO
HIBBERD & SPINNER,

Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery, Presses, Dies and Can Makers' Tools.



FULL LINE OF SUPPLIES.

9 CLIFF STREET, NEW YORK CITY.

POCOCK'S ECCENTRIC
FORMING MACHINE.



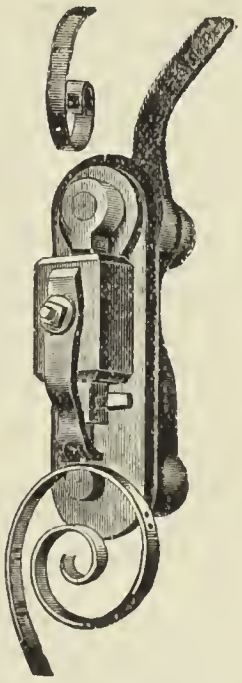
We invite your attention to this new Former for Tinners' and Sheet-Metal Workers' Rolls, on which we claim rapidity of operation, superior construction and durability. The back roll is moved by eccentrics instead of screws, and can be changed instantly from the smallest circle to the passing of a straight sheet. It will flare metal easier and better than any other machine in use. You can get closer to front roll, therefore bend a smaller circle. For sale by all leading jobbers. Send for circular to

O. POCOCK, Mfr.
363, 365, 367 Clark St.
CINCINNATI, OHIO.
3-inch Rolls with Slip Rolls a specialty

CHAS. G. ECKSTEIN & CO.,

45 Vesey St., New York.

Punches and Shears, Wrought Iron Ornaments, Mouldings, Rosettes, Fence Pickets, etc.



Compact Form, Simplicity, Durability.

Best Workmanship, Few Parts, Low Price.

SEND FOR CIRCULAR.

IF YOU WANT ANYTHING IN THE LINE OF
DROP PRESSES · DROP HAMMERS · STAMPS
OR AUTOMATIC DROP LIFTERS.
SEND FOR CATALOGUE TO
Miner & Peck Mfg. Co.
NEW HAVEN, CONN.
LARGEST LINE IN THE MARKET

PAT'D 1892
CORRUGATED CONDUCTOR HOOKS AND
TINNERS' SUPPLIES
SEND FOR CATALOGUE
59 NTH. 2ND ST.
L.D. BERGER. PHILADA PA

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This hapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstrat on is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

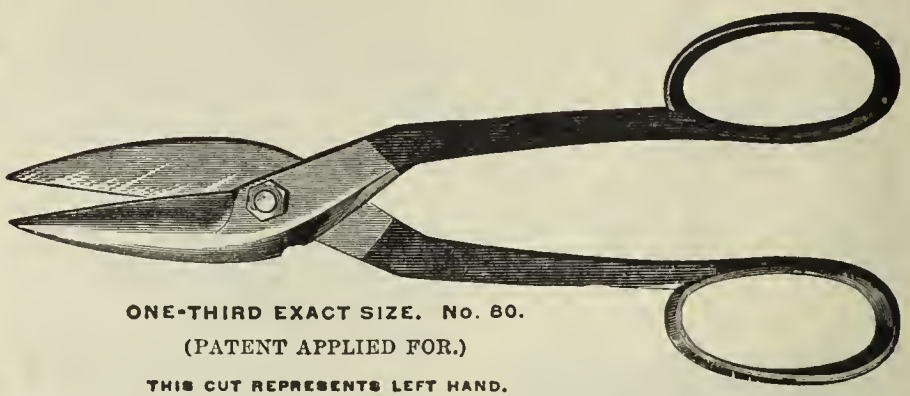
ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade Street, New York.

The "Lyon" Shear.



ONE-THIRD EXACT SIZE. No. 80.

(PATENT APPLIED FOR.)

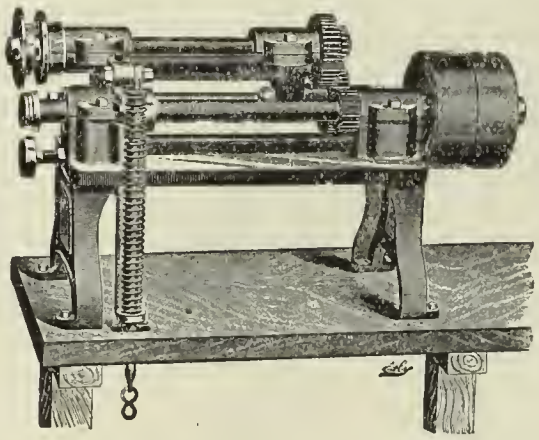
THIS CUT REPRESENTS LEFT HAND.

This shear is especially adapted to **Cornice and Tin Work,** being so constructed that **Scrolls, Circles,** &c., can be **perfectly** and **accurately** cut, which **cannot** be done with the ordinary shear.

LYON, CONKLIN & CO., BALTIMORE.

—— For Sale by ——

Fitz, Dana & Co.
Brown & Wales, } Boston, Mass.
Austin & Doten,
Meurer Bros. Co., Brooklyn, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.
The McIntosh-Huntington Co., Cleveland, O.
The F. H. Lawson Co., Cincinnati, O.
Sargent, Greenleaf & Brooks, Chicago, Ill.
W. S. Phelps & Son, Dayton, O.
O'Dell Hardware Co., Greensboro, N. C.
Stratton & Terstegge, Louisville, Ky.
Fones Bros. Hdw. Co., Little Rock, Ark.
Peden & Co., Houston, Texas.
Tanner & Sullivan, Indianapolis, Ind.
Manogue-Pidgeon Iron Co., Memphis, Tenn.
Phillips-Buttorff Mfg. Co., Nashville, Tenn.
C. S. Mersick & Co., New Haven, Conn.
Demmler Bros. } Pittsburg, Pa.
McClure & Co.,
G. & A. Bargamin, Richmoud, Va.
Excelsior Mfg. Co., } St. Louis, Mo.
A. Geisel Mfg. Co.,
Townley Stove Co., Terre Haute, Ind.
W. A. List & Co., Wheeling, W. Va.
Ed. Strauss, Waco, Texas.
C. A. Conklin Mfg. Co., Atlanta, Ga.



—OUR—

POWER TRIMMING MACHINE

is designed to trim the edges of **Sheet Metal Boxes, Rim Covers, Blacking Boxes, Lard Pail Covers, Ladle Bowls, Dipper Bowls and Similar Work. Will Trim Covers up to 1½ inches in depth and 15 in. diameter.**

—MANUFACTURED BY—

G. A. CROSBY & CO.,

176 & 178 So. Clinton St., Chicago, Ill., U.S.A.,

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap and Boiler Makers, and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Wire Goods, Brass Goods and all Hardware Novelties.**

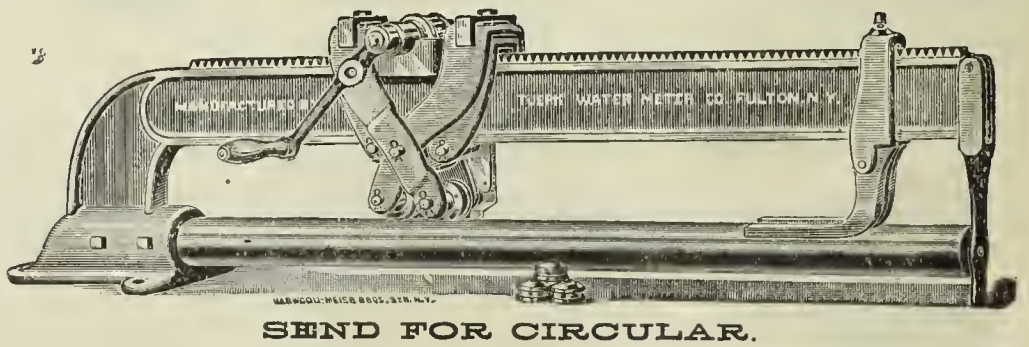
Special Attention to Dies of Every Description.

WORK GUARANTEED THE BEST.

Write for Prices and Our New 200-Page Catalogue.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.

TUERK WATER METER CO.'S GROOVER.



SEND FOR CIRCULAR.

Manufactured by TUERK WATER METER CO., Fulton, N. Y.

ALPHABETICAL LIST OF ADVERTISERS.

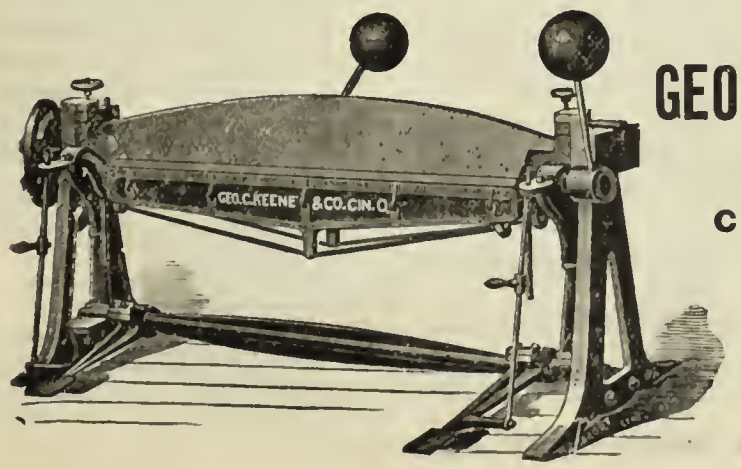
Acme Roofing Co..... 66
Ætna Standard Iron & Steel Co..... 79
Allen's Corrugating Wks... 82
American Radiator Co..... 1
American Roofing Co..... 86
American Sheet Iron Co..... 61
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 78
Auld & Conger..... 74
Bailey-Farrell Mfg. Co..... 74
Bangor Excelsior Slate Co.. 88
Barstow Stove Co..... 96
Bascom, H. Clay.. 71
Belden, F. E. Mica Mining Co..... 23
Belding Mfg. Co.....24&25
Bellaire Stamping Co..... 67
Berger Bros..... 76
Berger, L. D.....73&89
Berger Mfg. Co..... 62
Bertsch & Co..... 89
Bibb, B. C. Stove Co..... 16
Biles, E. W. Co..... 94
Blodgett, G. S. Co..... 22
Boss Washing Machine Co... 64
Bowen Mfg. Co..... 27
Bower, B. P. & Co..... 77
Bowers, Galpin & Co..... 78
Brauer, A. G..... 71
Brombacher's Sons, Jacob.. 95
Bronson Supply Co..... 69
Bruce & Cook.....83&96
Buffalo Register Works..... 23
Burtis, A. L..... 86
Burton, W. J. & Co..... 84
Calely, Ed. L..... 71
Calvert, P. B. & Co..... 81
Cambridge Iron & Steel Co.. 80
Canfield, H. O..... 77
Canton Steel Roofing Co..... 87
Carton Furnace Co..... 3
Central Stamping Co..... 68
Challenge Corn Planter Co.. 26
Cheney, S. & Son..... 71
Chicago & Erie Stove Co..14&15
Cincinnati Corrugating Co.. 85
Clark Novelty Co..... 76
Clark, Quien & Morse..... 73
Clayton & Lambert Mfg. Co. 73
Cleveland Gas Machine Co.. 67
Clough, R. M 91
Columbia Roofing Co..... 87
Colwell Lead Co..... 78
Cooney, Selner & Co..... 76
Cope, Geo. W..... 71
Corning Mfg. Co. 16
Correspondence School of Mechanics..... 61
Cortright Metal Roofing Co. 87
Cory, U. & Co... 18
Covert Mfg. Co..... 73
Craig-Reynolds Fdy. Co..... 15
Crosby, G. A. & Co..... 90
Curtis & Curtis..... 76
Dalton-Ingersoll Co..... 72
Dangler Stove & Mfg. Co.... 5
Day Mfg. Co..... 75
Dayton Mfg. Co..... 11
De Haven & Co..... 12
Deming Co..... 76
Dixon, Jos., Crucible Co..... 63
Dixon-Woods Co..... 11
Douglas, W. & B..... 76
Dover Machine Works..... 91
Dunlap, John Co..... 81
Dwight Slate Machine Co.... 88
Eckstein, Chas. G. & Co..... 89
Electric Boiler Co..... 16
Eiler, J. H. & Co..... 86
Emack, John D..... 88
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 88
Fostoria Steel Roofing Co... 87
Fox, Chas. F..... 27
Frink, I. P..... 96
Friedenwald Bros..... 72
Friedley & Voshardt..... 86
Froelich, A., Estate of..... 70
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 88
Garry Iron & Steel Roofing Co..... 87
Gender & Paeschke Mfg. Co. 66
Globe Iron Roofing & Corrugating Co..... 87
Globe Ventilator Co..... 71
Gobeille Pattern Co..... 71
Gordon, W. J..... 88
Gorton & Lidgerwood Co..... 1
Graff & Co..... 15
Greene, W. F..... 63
Griswold Mfg. Co..... 63
Gummey, Spering & Co..... 79
Gurney Heater Mfg. Co..... 17
Gurney Refrigerator Co..... 26
Halliday, M..... 87
Hart & Crouse..... 13
Hartford Hollow Ware Co.. 67
Hess, Snyder & Co. 18
Highland Foundry Co..... 1
Highton, Wm. & Sons..... 22
Holton Iron Roofing Co..... 87
Howard Furnace Co..... 28
Howard Thermostat Co..... 22
Howson & Howson..... 61
Hull, M. L..... 73
Ideal Strainer Co..... 64
Illinois Zinc Co..... 83
Iwan Bros..... 64
Jackson's Sons, W..... 14
Jenkins Bros..... 1
Jersey City Galvanizing Co. 74
Johnson, E. J. & Co 88
Kanneberg Roofing Co..... 77
Kansas City Metal Roofing & Corrugating Co..... 80
Keen & Hagerty..... 69
Keene, Geo. O. & Co 91
Kelly, Thos. & Bro..... 72
Kemp, C. M Mfg. Co..... 75
Keuffel & Esser Co..... 61
Kewanee Boiler Co..... 22
Kieckhefer Bros. & Co..... 68
Kieley, T..... 1
Kilbourne & Jacobs Mfg. Co. 73
Lawrence-Letts Elbow Co... 78
Lindemann, A. J. & Hoverson Co..... 10
Littleford Bros..... 85
Lyon, Conklin & Co..... 90
McDaniel & Harvey Co..... 83
McLaughlin, J. K..... 71
Mahony, M..... 19
Marcy Stove Repair Co..... 70
Marlin & Co..... 78
Marston, I. G. & Co..... 75
Mason Regulator Co..... 1
Mayo, Bechtel & Co..... 63
Merchant & Co., Inc..... 84
Merry, Geo. E..... 79
Menrer Bros. Co..... 82
Mica Mfg. Co..... 23
Michigan Stove Co.....20&21
Michigan Vapor Stove Co... 11
Millar, Chas. & Son..... 96
Miller, Jas. A. & Bro.....77,86&87
Miner & Peck Mfg. Co..... 89
Monarch Stove Co..... 8
Montross Metal Shingle Co.. 84
Mt. Penn Stove Works..... 12
Mowry, W. O..... 16
Mullins, W. H..... 85
Munsell, E. & Co... 23
Myers, F. E. & Bro..... 76
National Wringer Co..... 66
Newark Regulator Co..... 74
New Castle Steel & Tin Plate Co..... 81
New Haven Heating & Plumbing Co..... 17
New York Central Iron Wks. 17
New York Elbow Co..... 67
New York Iron Roofing & Corrugating Co..... 86
New York Metal Ceiling Co.. 85
New York Nickel Plating & Mfg. Co..... 70
Niagara Stamping & Tool Co. 95
Niles Mfg. Co..... 68
Obdyke, W. A. & Co..... 77
Obermayer, S. Co..... 70
Ohl, Geo. A. & Co 94
Osborn, J. M. & L. A..... 79
Ostrander, W. R. & Co..... 23
Page Boiler Co., Wm. H..... 19
Palermo Mica Co..... 23
Pancoast, Henry B. & Co.... 75
Paxson, J. W. & Co..... 70
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 75
Penn Iron Roofing & Corrugating Co..... 84
Phelps, Dodge & Co 80
Phillips Tin Plate Co..... 82
Pocock, O..... 89
Pontyminster Old Style Ternes..... 80
Poorman Mfg. Co..... 89
Powers & Boyd Galvanized Iron Cornice & Roof'g Co. 85
Presbrey Stove Lining Co... 71
Proudman Bros..... 78
Puffer, W. E..... 61
Putnam Foundry & Machine Co..... 19
Rasner & Dinger..... 85
Rathbone, Sard & Co..... 9
Republic Iron Works, ... 79
Ringen Stove Co..... 2
Rising & Nelson..... 88
Robinson, J. M. & Co..... 95
Rochester Stamping Wks.... 67
Rome Mfg. Co..... 69
Root, A. L..... 88
Rutland Fire Clay Co. .. . 71
St. Louis Corrugating Co.... 82
St. Louis Stamping Co..... 69
S. S. S. Conductor Co..... 78
Salem Nail Co..... 88
Sanborn, John..... 87
Saunders' D. Sons..... 74
Savill, Walls & Co..... 75
Sayre Stamping Co..... 63
Schaffer, J. P..... 23
Schneider & Trenkamp Co.. 7
Scollay, J. A..... 18
Shepard, Sidney & Co..... 64
Sheppard, Isaac A. & Co..... 1
Sime Mfg. Co. 76
Smith & Winchester Co..... 19
Smith Co., H. B.....
Smith, J. D. Foundry Supply Co..... 71
Souther, E. E. Iron Co..... 80
Special Notices..... 61
Sperry, D. R. & Co..... 67
Stamford Foundry Co..... 14
Standard Lighting Co..... 6
Star Coupler Co..... 13
Star Mfg. Co..... 67
Stebbins, E. Mfg. Co..... 77
Steel Clad Bath Co..... 72
Steele, C. C..... 64
Stellwagen & Kynoch..... 27
Stiles & Parker Press Co.... 94
Stocking, E. B..... 61
Sykes Iron & Steel Roofing Co 87
Taplin, Rice & Co..... 14
Tarbox Mfg. Co..... 70
Taylor & Boggis Foundry Co. 82
Taylor Co., N. & G..... 96
Thatcher Furnace Co..... 13
Thorn Shingle & Ornament Co..... 82
Tinners' Machinery & Supply Co.....
Tinplate Decorating Co..... 80
Toledo Machine & Tool Co.. 88
Trimont Mfg. Co..... 75
Troy Nickel Works..... 27
Tuerk Water Meter Co..... 90
Tuttle & Bailey Mfg. Co..... 22
United States Heater Co.... 18
Valentine, M. D. & Bro. Co... 71
Van Noorden, E. & Co. 84
Van Range Co., John 4
Vedder Pattern Works..... 71
Vogel, William & Bros..... 66
Washburne, E. G. & Co..... 71
Weatbered's, Thos. W. Sons 17
Weiskittel, A. & Son..... 23
Western Stove & Mfg. Co.. 10
White Mountain Freezer Co. 65
Whitlock, W..... 73
Wisconsin Refrigerator Co.. 26
Wise, John & Son..... 68
Wister, L. & R. & Co..... 96
Wohler Aluminum Co..... 70
Wood, Alan Co..... 80
Wood Co., W. Dewees..... 96
Yates & Co..... 61
Zero Valve Co..... 76

THE KEENE FOOT POWER

CORNICE BRAKE.

EASIEST TO OPERATE, STRONGEST AND BEST.

Sheet Metal Working Machinery of all Kinds.



GEO. C. KEENE & CO.,

Cincinnati, O.

AGENTS:

Hibberd & Spinner,
9 Cliff St., New York

Holder & Herrick,
49 Broad St., Boston, Mass.

Ledwidge & Co.,
234 Lake St., Chicago, Ill.

PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

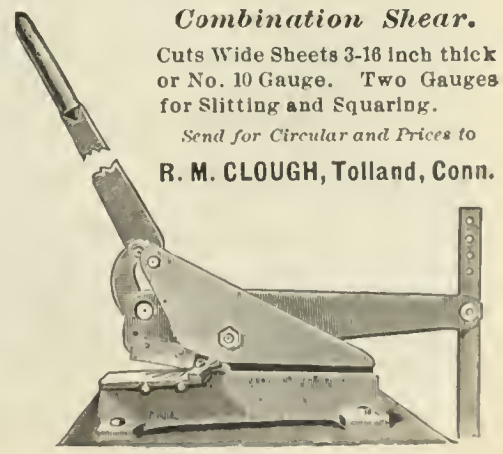
DOVER MACHINE WKS., Dover, Del.

Combination Shear.

Cuts Wide Sheets 3-16 inch thick or No. 10 Gauge. Two Gauges for Slitting and Squaring.

Send for Circular and Prices to

R. M. CLOUGH, Tolland, Conn.



CLASSIFIED LIST OF ADVERTISERS.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield H. O., Bridgeport, Conn.

Bathtubs.
Day Mfg. Co., Detroit, Mich.
Peck Bros., & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers Tools and Machines.
Bliss E. W. Co., Brooklyn, N. Y.
Crosby G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y

Castings.
Cheney, S. & Son, Manlius, N. Y.
Taylor & Boggis Fdry. Co., Cleveland, O

Cellar Drainers.
Friedenwald Bros., Baltimore, Md.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Chucks.
Whitlock, W., 39 Cortlandt St., N. Y.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Conductor Pipe and Elbows.
Acme Roofing Co., Canton, O.
Allen's Corrugating Works, Chicago, Ill.
Berger Bros., Philadelphia, Pa.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kauneberg Roofing Co., Canton, Ohio.
Lawrence Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A., & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Corrugating Works, Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.
Powers & Boyd Galvanized Iron Cornice and Roofing Co., St. Louis, Mo.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cuspidores.
Rochester Stamping Works, Rochester, N. Y.

Cut-Offs, Rain-Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co. Indianapolis,
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Mayo, Bechtel & Co., Pottstown, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
E. W. Bliss Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Mfg. Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill
Proudman Bros., Meriden, Conn.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Flour Bins and Sifters.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Foundry Facings, Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N, Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Craig-Reynold Foundry Co., Dayton Ohio.
Cory, Uzal & Co., 210 Water St., N. Y.
Frout Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J. F, Furnace Co., Syracuse, N.Y.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Conn.
Thatcher Furnace Co., 240 Water St., N. Y.

Furnaces, Plumbers' and Tinners'.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Hull, M. L., Cleveland, O.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Groovers.
Tuerk Water Meter Co., Fulton, N. Y.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y
Poorman Mfg. Co., Canton, Ohio.

Heater Regulators.
Buffer, W. E., 8 Peck Slip, N. Y.

Heaters, Steam and Hot-Water.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Fuller & Warren Co., Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New Haven Heating & Plumbing Co., New Haven, Conn,
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Putnam Foundry & Machine Co., Putnam Conn.
Scollay, Jno. A., Brooklyn, N. Y.
Smith Co., H. B. 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass
Thatcher Furnace Co., 240 Water St. N. Y.
United States Heater Co., Detroit, Mich
Weathered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Wohler Alumiuum Co., Chicago, Ill.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Ice Cream Freezers.
White Mountain Freezer Co., Nashua N. H.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co. Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Gender & Paeschke Mfg. Co., Milwaukee, Wis.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 89 Fulton St., N. Y.

Molding Sand.
Obermayer, S. Co., Cincinnati, Ohio.
Smith, J. D., Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating and Mfg. Co., 227 and 229 West 29th St., N. Y.

Oil Cans.
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Pattern Charts,
Burtis, A. L., Lockport, N. Y.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, Jno. K., Phila., Pa.
Vedder Patteru Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa
Bower, B. P. & Co., Cleveland, O.
Canfield, H. O., Bridgeport, Conn
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Hull, M. L., Cleveland, O.
Kelly, Thos. & Bros., Chicago Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
Star Coupler Co., St. Louis, Mo.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher
Vogel, Wm. & Bros., 37 to 47 S. Brooklyn.

Pot Covers.
Shepard, Sidney & Co., Buffalo, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven Conn.
Peck, Stow & Wilcox Co., 27 Chambers St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 45 Vesey St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Gas.
Welskittel, A. & Son, Baltimore, Md.

Radiators, Steam & Hot Water
American Radiator Co., Chicago, Ill.
Exeter Mch. Works, Boston, Mass.
Gurney Heater Mfg. Co. Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl Street, N. Y.

Refrigerators.
Belding Mfg. Co., Belding, Mich.
Bower Mfg. Co., Foud du Lac, Wis.
Challenge Corn Planter Co., Grand Haven, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.
Wisconsiu Refrigerator Co., Eau Claire Wis.

Registers.
Buffalo Register Works Buffalo, N. Y.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St. N. Y
Wise, J. & Son, Butler, O.

Rool Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel Corrugated and Plain.
Acme Roofing Co., Canton, O.
American Roofing Co., Cincinnati, O.
Berger Mfg. Co., Canton, O.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinna i Corrugating Co., Piqua, O.
Columbia Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, Ohio.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kauneberg Roofing Co., Canton, O.
Kansas City Metal Roofing and Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
Souther, E. E. Iron Co., St, Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Conn.
Lyon, Conklin & Co., Baltimore, Md.
Pocock, O., Cincinnati, Ohio.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Emack, J. D., Philadelphia, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Jonnson, E. J. & Co., 38 Park Row, N. Y.
Rising & Nelson, West Pawlet, Vt.

SEE ALPHABETICAL INDEX, PAGE 91.

Sap Spouts.
Millar, C. & Son. Utica, N. Y.
Stelle, C. C., Brooklyn, N. Y.

School of Instruction.
Correspondence School of Mechanics' Scranton, Pa.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover, Del
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co. Toledo, O.
Tuerk Water Meter Co., Fulton, N. Y.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Thorn Shingle and Ornament Co. Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.
Rasner & Dinger, Pittsburgh, Pa.

Slater's Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Patterns.
Bascom, H. Clay, Troy, N. Y.
Caley, Edw. L., Philadelphia, Pa.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son., Manlius, N. Y.

Stove Repairs.
Braner, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., City.
Troy Nickel Works Troy, N. Y.

Stove Trucks.
Fox, Chas. F., Dayton, Ohio.
Stellwagen & Kynoch, St. Ignace, Mich.

Stoves and Ranges.
Bibb, B. C., Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
DeHaven & Co., Pittsburgh, Pa.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co, Boston, Mass
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Stamford Foundry Co., Stamford, Conn.
Tapiln, Rice & Co., Akron, O.
Thatcher Furnace Co., 240 Water St. N. Y.
Van, John, Range Co., Cincinnati, O.

Stoves and Ranges, Gas.
Chicago & Erie Stove Co., Erie, Pa.
Dixon-Woods Co., Pittsburgh, Pa.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Weiskittel, A. & Son, Baltimore, Md.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Dangler Stove & Mfg. Co., Cleveland, O.
Dayton Mfg. Co., Dayton, Ohio.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Mich. Vapor Stove Co., Grand Rapids, Mich.
Monarch Stove Co., Mansfield, Ohio.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Western Stove and Mfg. Co., Milwaukee, Wis.

Strainers, Tea and Coffee.
Ideal Strainer Co., Boston, Mass.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N. Y

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Bruce & Cook, 186 to 190 Water St. N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Dunlap, John Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila., Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., N. Y.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Keen & Hagerty, Baltimore, Md.
Kleckhefer Bros. & Co., Milwaukee Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.
Trimont Mfg. Co., Roxbury, Mass.

Tools, Machines and Supplies Tinners'.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N. Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, George A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., Cliff St., N. Y.

Traps and Vents.
Bower, B. P. & Co., Cleveland, O.

Valves.
Jenkins Bros., 71 John St., N, Y,
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Calvert, P. B. & Co., Philadelphia.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Washing Machines.
Boss Washing Machine Co., Cin., Ohio.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, O. M. Mfg. Co., Baltimore, Md.

Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA AND MEXICO, - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - -	$1.00	SIX MONTHS, - - - - -	$22.10
ONE MONTH, (5 Times.) - - - -	5.00	ONE YEAR, - - - - - -	40.80
THREE MONTHS, - - - - -	12.35		

RATES FOR LARGER SPACES QUOTED ON APPLICATION.

DAVID WILLIAMS, Publisher,

96, 98, 100 and 102 Reade Street, NEW YORK. **59 Dearborn Street, CHICAGO.**

New York (Main Office), - - -	96-102 Reade Street. - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509, Hamilton Building, - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - -	HENRY SMITH, Manager.
St. Louis, - - - - - - -	Bank of Commerce Building, - - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*. 42 Cannon St., London,

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe; or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A., The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

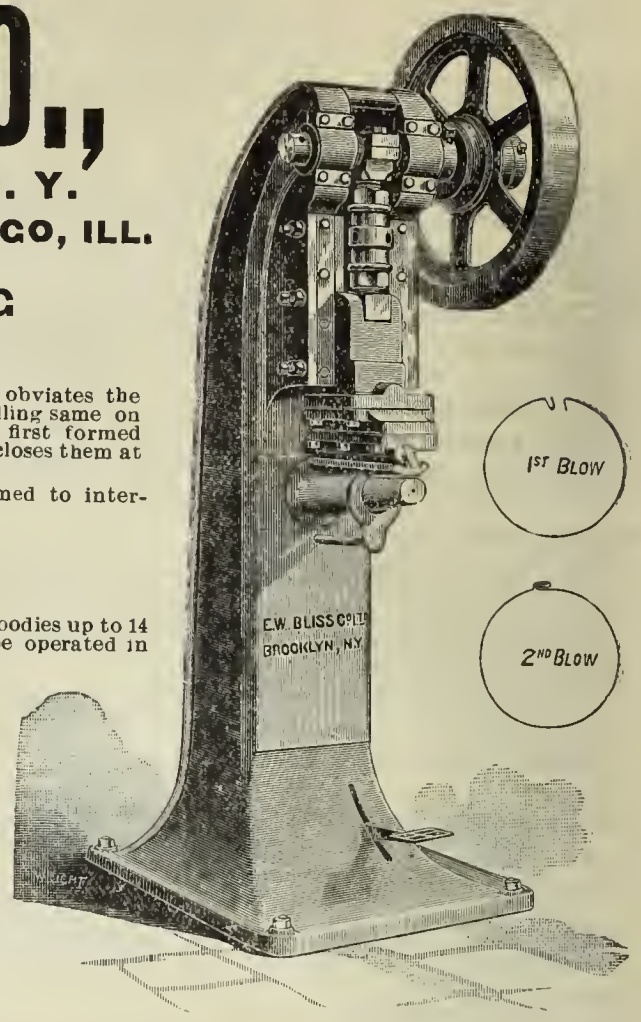
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.



PRESSES, PUNCHES, SHEARS,

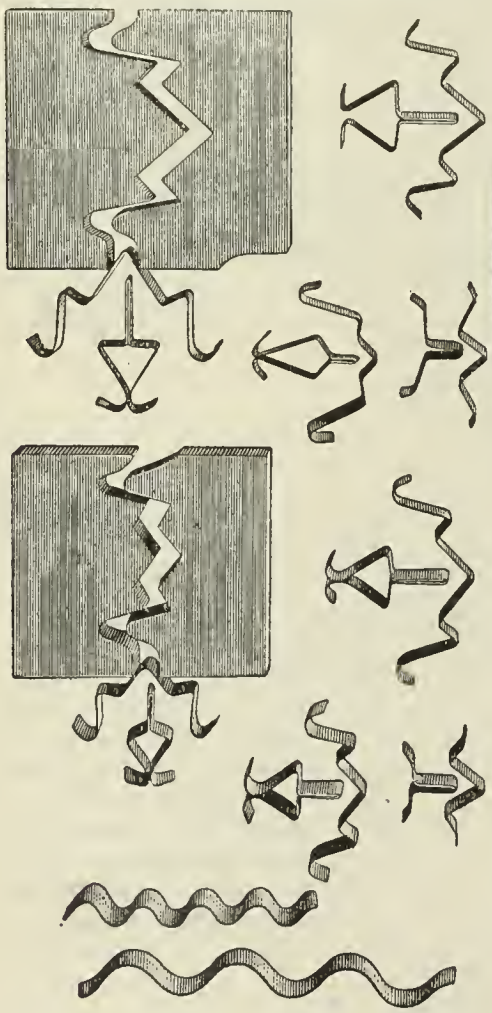
DROP HAMMERS,

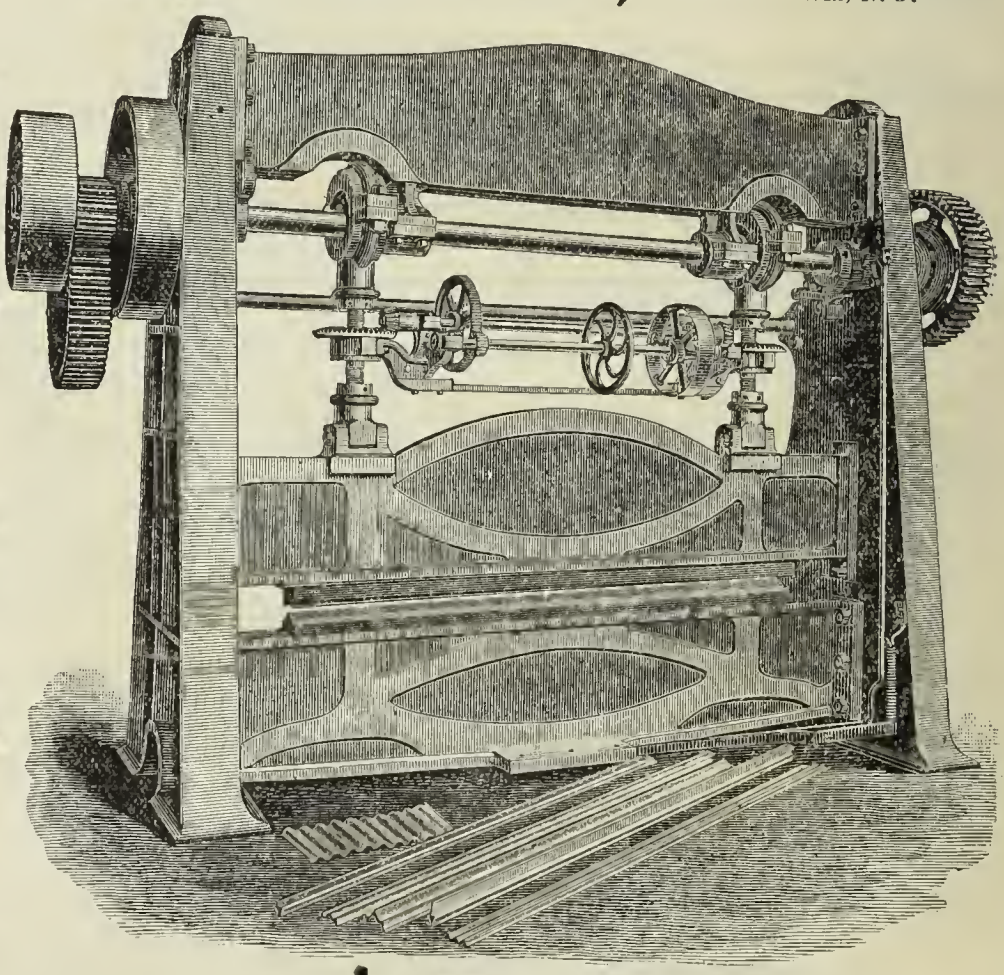
DIES, SPECIAL MACHINERY, &c.

THE STILES & PARKER PRESS CO.

GEO. A. OHL & CO., 157, 159, 161 Oraton Street, NEWARK, N. J.

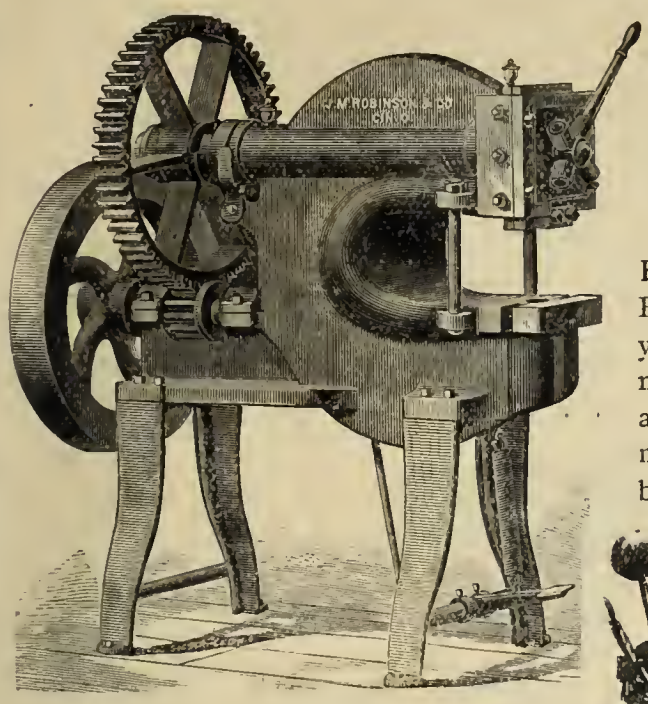
SOME SAMPLES OF WORK PRODUCED ON THESE MACHINES.





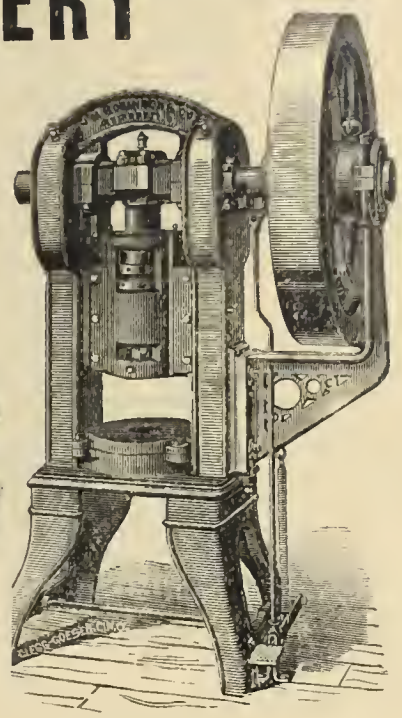
Improved Sheet Metal Power Press.

The above cut represents a ten foot power press weighing 20,000 pounds. This machine will make a skylight bar seven (7) bends at once of No. 24 iron, corrugate as heavy as No. 14 iron, also will press out mouldings of any shape that can be pressed between two dies. It is provided with a special mechanism for raising and lowering the hammer, with the die holder and die, to suit the different heights of the latter.

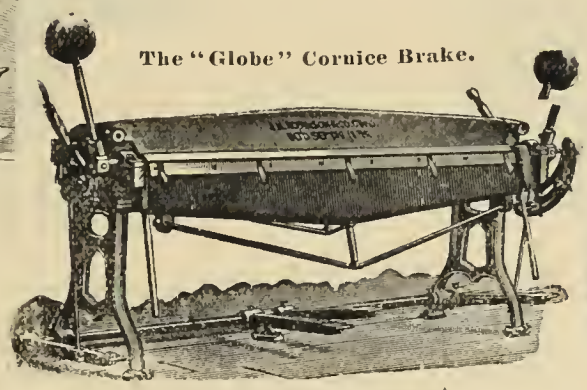


DO YOU USE POWER MACHINERY

For working Tin, Galvanized Iron, Brass, Zinc or Copper Sheets? If you do, we make a specialty of machinery for this purpose. We also make hand and foot power machinery to do the same work, but lighter, of course. Write us.

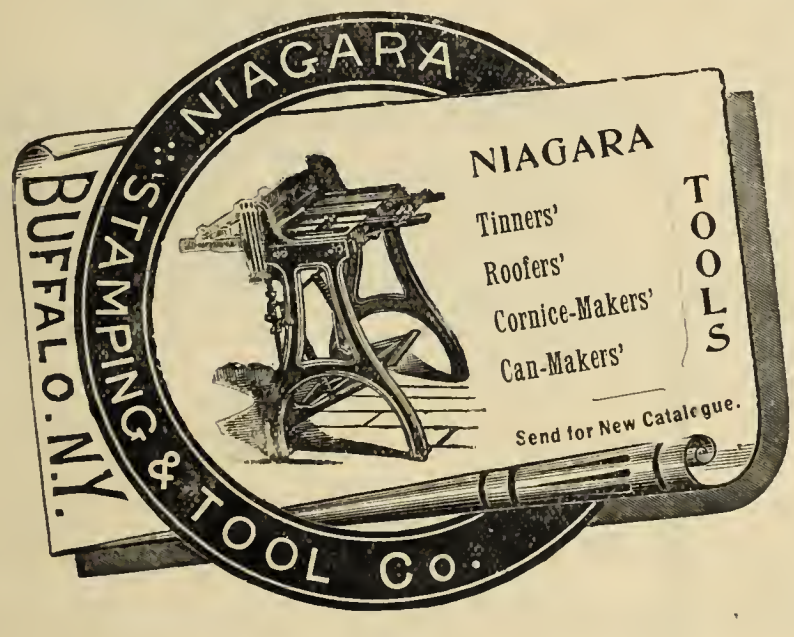


The "Globe" Cornice Brake.

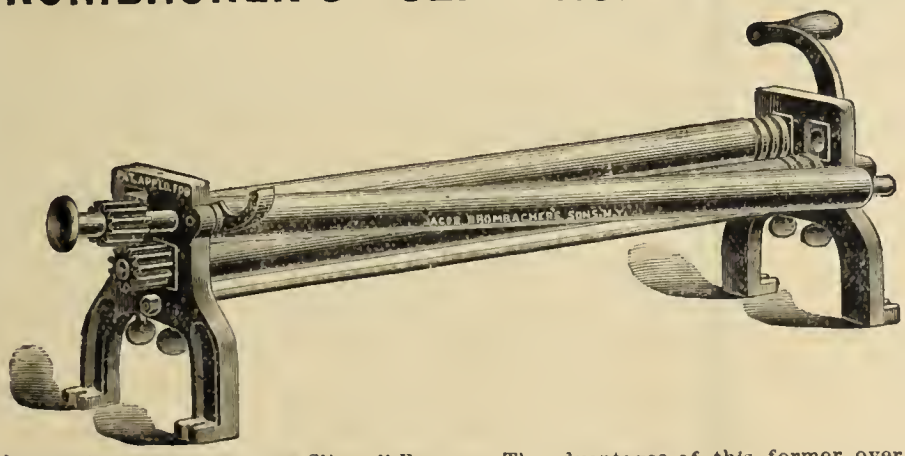


J. M. Robinson & Co.,

CINCINNATI, O.



BROMBACHER'S SLIP ROLL FORMER.



Above cut represents our new Slip-roll Former. The advantages of this former over ordinary formers are

First, that the rollers are made of cold rolled steel rolls.

Second, it has cut gears with consequent smoothness of operation.

Third, the thumb screws are inserted from underneath, consequently the box carrying the rollers rests on the screws instead of the screws carrying the boxes and rollers; this obviates the possibility of breaking thumb screws.

Fourth, we do not have to split one frame in order to obtain the slip-roll mechanism, and we therefore have all the rigidity of ordinary formers with all the convenience of slip-roll formers.

Above design makes the smoothest and quickest operating and stiffest Former on the market and they are sold at the price of ordinary Stove Pipe Formers.

JACOB BROMBACHER'S SONS - - No. 30 Cliff St., N. Y. City.

Established 1833 Incorporated 1887.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

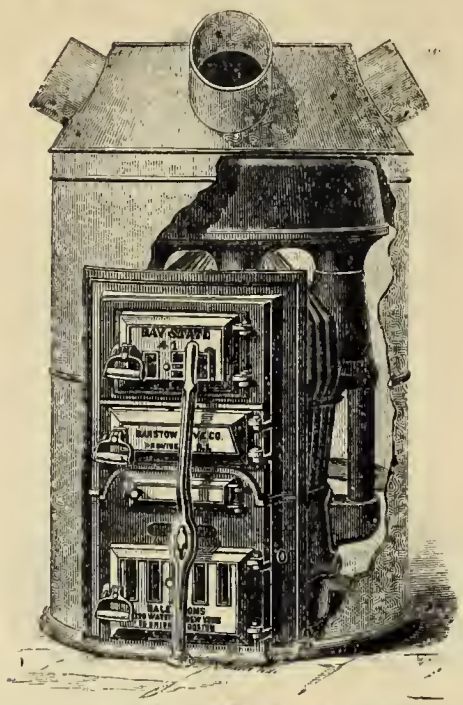
Sent post-paid on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade Street, New York.

ARE YOU IN DOUBT

Of the merits of



THE BAY STATE FURNACE?

It is VERY HEAVY.

It is casting of the HIGHEST GRADE.

It is SCIENTIFICALLY CONSTRUCTED.

This means it is

POWERFUL.—DURABLE.—ECONOMICAL.

THEN THE PRICE IS RIGHT,

And these are what uphold us in saying

IT IS THE VERY BEST.

Why not order a sample or send for special circulars and secure the agency for your territory?

BARSTOW STOVE COMPANY,

Incorporated,

BOSTON. PROVIDENCE R. I. NEW YORK.

Have you our Catalogue and Price-List?

Tinplate

—FOR—

Sugar Buckets and Kindred Uses.

12 X 12	28 X 20
12 X 24	14 X 21
10 X 20	14 X 22
14 X 20	15 X 21
16 X 20	16 X 22
11 X 22	20 X 20

IC and IX, PRIMES and WASTERS.

N. & G. TAYLOR CO.,

Manufacturers,

PHILADELPHIA.

ESTAB. 1857.



The Great CHURCH LIGHT. Frink's Patent Reflectors for Gas, Oil or Electric, give the most powerful, softest, cheapest and best light known for Churches, Stores, Banks, Theatres, Depots, &c. New and elegant designs. Send size of room. Get circular and estimate. A liberal discount to churches and the trade. *Don't be deceived by cheap imitations.* I. P. FRINK, 551 Pearl St., N. Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK,

TINNERS' TOOLS and MACHINES,

TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street,

NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOOK.

By far the best Spout made. Greatly improved this season. More used every year than all others combined. Sold by leading jobbers everywhere, and to them by

CHARLES MILLAR & SON, Utica, N. Y.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY.

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON.

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. Also WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.

Branch Office, 111 Water St., Pittsburgh Pa.

The Metal Worker Essays on House Heating by Steam, Hot Water and Hot Air.

WITH INTRODUCTION AND TABULAR COMPARISONS.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

How to Effectively and Economically Heat a Given Building

is a problem of the highest importance to the Architect, Builder and Owner. Shall steam, water or air be employed as a medium? What are the relative merits of the different systems? By what means can a comparison be instituted that will show their respective advantages?

The essays comprised in this volume are some of the results of a prize contest conducted by *The Metal Worker* some time since. They include the prize essays and selections from the best of the others. The foundation of all the essays is a house, the floor plans and elevations of which were the result of previous competitions conducted by *Carpentry and Building*. The elevations and the plans of this house were carefully printed on separate sheets adapted to receive at the contestants' hands lines indicating the position of heater, runs of pipes, location of radiators, etc., thus insuring a uniformity in presentation, and also holding the competitors to exactly the same conditions. The result, therefore, is a book in which are shown: First, different means of heating the same house, among which may be instituted various comparisons, and, second, several different interpretations of each of the several methods, among which also instructive comparisons may be instituted.

The work is not a mere theoretical consideration of principles and a statement of facts gained by inquiry in the trade; but, instead, a collection of essays by practical men, each showing how one man would go about heating the building in question, using the means with which he is best acquainted in practice. Features of the book which are not the least important among its numerous merits are the *lists of items and statement of cost* accompanying the different essays. Never before in the history of the heating trades has there been offered such a collection of information directly from the practice of those who are actively engaged in the heating business as is contained in this volume.

"The whole forms a valuable and instructive exposition of current practice in house heating."—*American Machinist.*

"Covers the ground very completely."—*Scientific American.*

"It will be found as complete a compendium as possible of existing information on this subject, amply illustrated by drawings."—*The Sanitary Era.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume. Price, $3.00.

SENT, POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS, Publisher, 96-102 Reade St., New York.

Index to Reading Matter, Page 52.

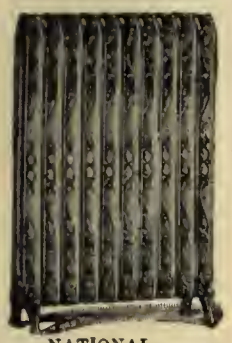
Index to Advertisements, Pages 91 - 93.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

VOL. XLIII. NUMBER 2. | NEW YORK AND CHICAGO, JANUARY 12, 1895. | ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



NATIONAL.

AMERICAN RADIATORS (TRADE-MARK.) BEST ON EARTH.

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

111 and 113 Lake Street, CHICAGO, ILL.

New York. 98 Centre St. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F & W Co.

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.

FULLER & WARREN CO. TROY, N.Y.

PARAGON HOT AIR FURNACES

SIX POINTS ~ 1·FEWEST JOINTS 2·EQUALIZED DRAFT 3·LARGEST RADIATING SURFACE 4·ABSOLUTELY SELF CLEANING 5·BALL BEARING GRATE 6·PERFECT ADAPTABILITY TO ANY KIND OF COAL

ISAAC A. SHEPPARD & CO. —MANUFACTURERS PHILADELPHIA, PA. & BALTIMORE, MD.

Write for our FURNACE BOOK "HINTS ABOUT HEATING"
It will interest you IT MAY HELP YOU
EXCLUSIVE RIGHTS GIVEN TO ENTERPRISING DEALERS

Apollo Best Bloom

There is great difference in galvanized iron.

You can always get flat sheets and workable iron, if you buy of a first-rate jobber. No jobber that has any careful trade could hold it without the Apollo brand.

There are three reasons for selling common iron: (1) it costs less by the ton, and generally is sold for the same in small quantities; so the profit on it is greater; (2) it is good enough for some uses; (3) and many metal-workers don't know the difference.

The difference is: the Apollo is flat (no buckling) and soft (no breaking when bent) and true to gauge—(no loss in buying by weight and selling by measure.).

APOLLO IRON AND STEEL CO

PITTSBURGH PENNSYLVANIA

WORKS AT APOLLO

Write for new Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES

HIGHLAND FOUNDRY CO., BOSTON, - MASS.

SECOND EDITION.

"Kitchen Boiler Connections."

A Selection of Practical Letters and Articles

—RELATING TO—

Water Backs and Range Boilers.

Compiled from *The Metal Worker*.
71 Illustrations.

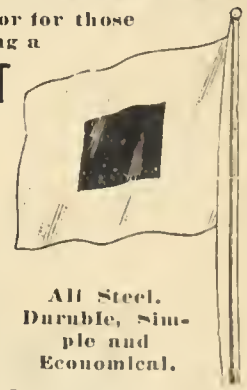
A Practical Helper. Price, $1.00.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG

Has no terror for those using a

FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis Mo.

BOILERS. EXETER RADIATORS.

EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO.,
Boston, Mass.



JENKINS' STANDARD PACKING IS MADE, SOLD, GUARANTEED to keep leaky joints TIGHT.

It has accomplished this for twenty years, and that's why it's best.

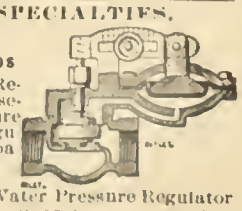
JENKINS BROS.,
New York. Philadelphia. Boston. Chicago.

STEAM SPECIALTIES.

Pump Governors,
Steam Traps

Steam and Water Reducing Valves, Noiseless Back Pressure Valves, Damper Regulators and Oil Separators.

Send for Circulars.



Water Pressure Regulator

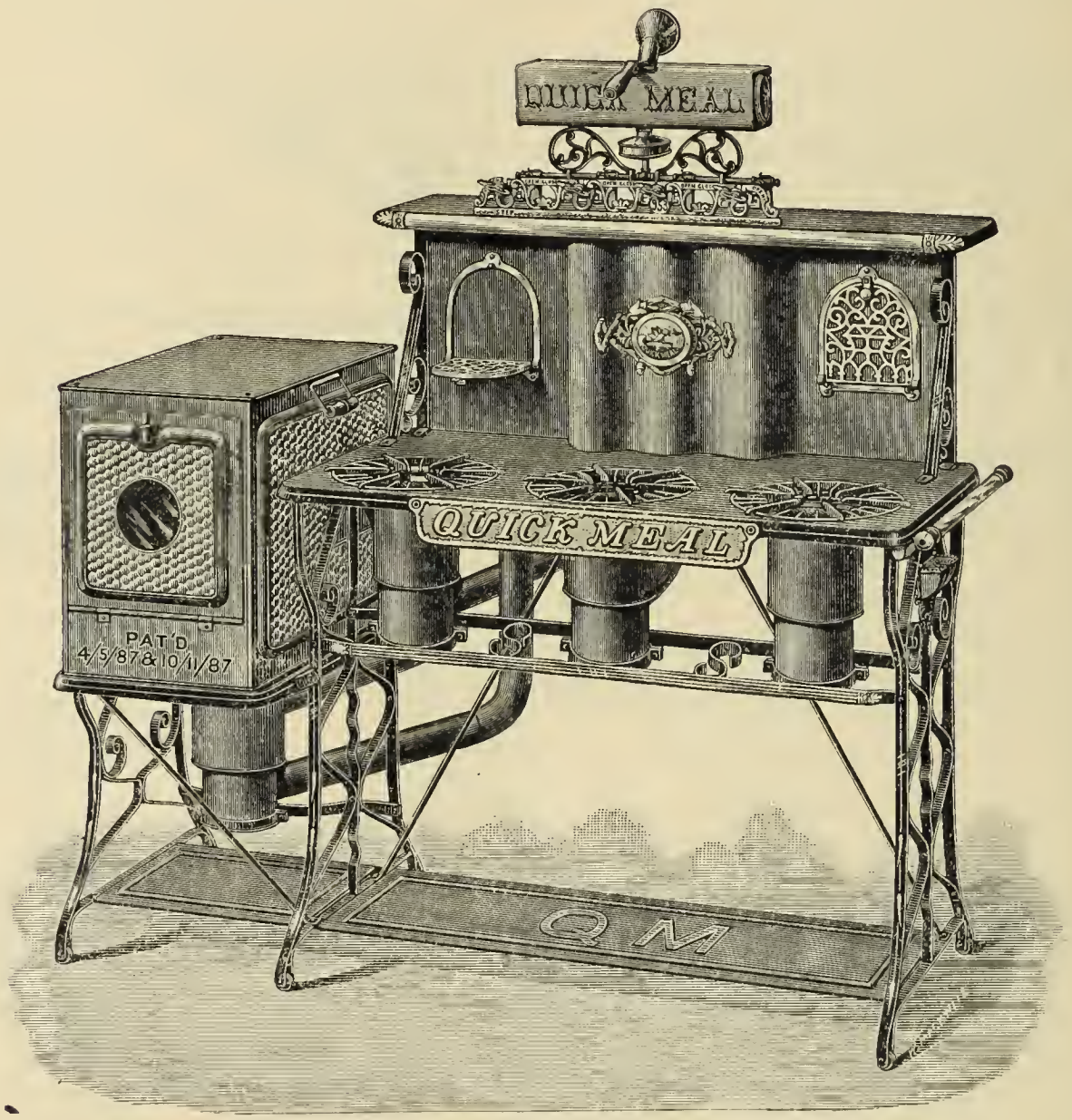
F. KIELEY, 7 to 11 W 13th St., NEW YORK.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

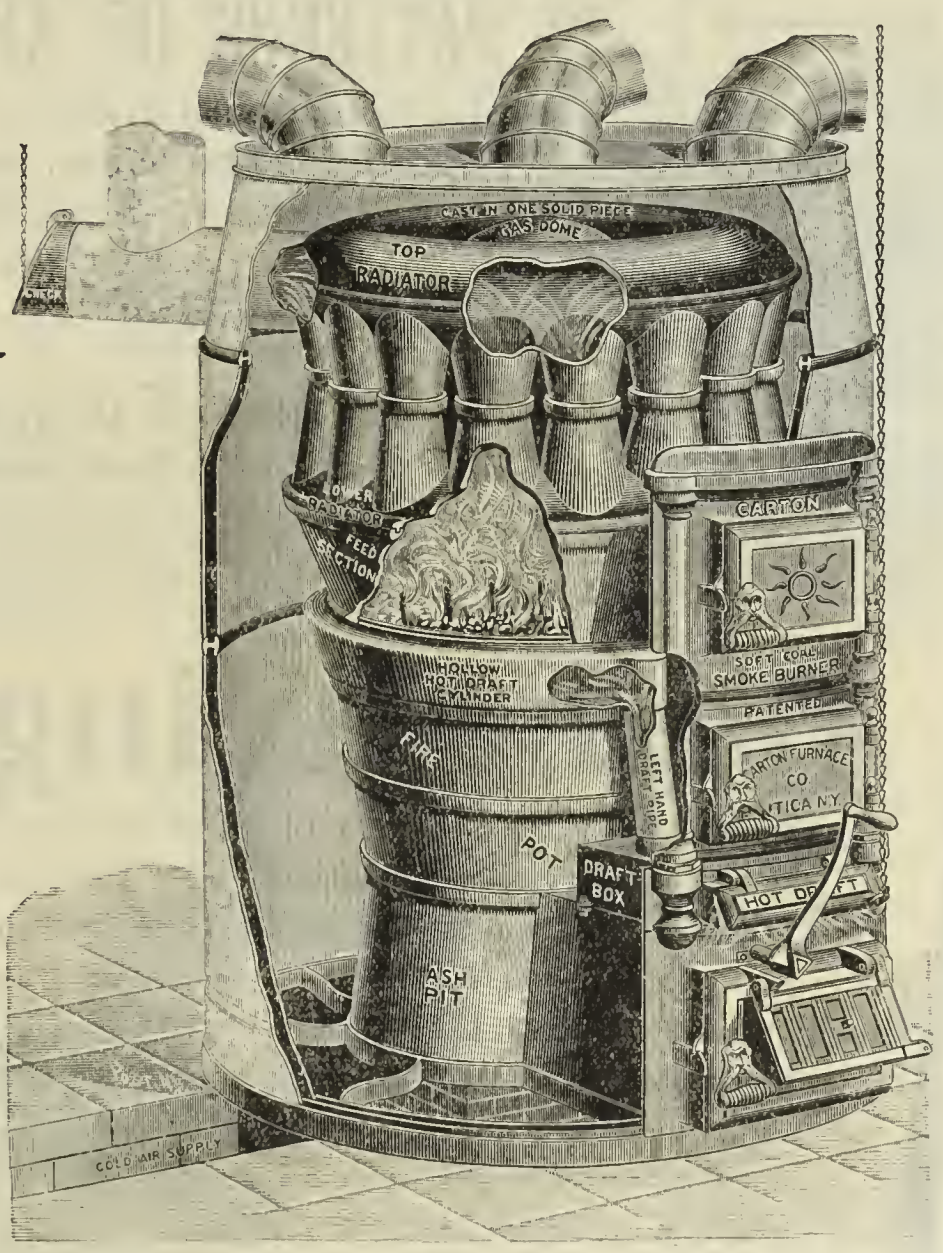
ST. LOUIS.

Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

Hot Water & Steam Boilers & Furnaces.

Our Soft Coal Smoke Consumer.



No Smoke.

No Soot.

Vertical Combustion Flues. Draft EQUALLY divided.
NO CENTRE Draft, but ALL SIDE Draft.
No accumulations in Radiators. No Clean-out Doors.
NO Bolts Used. Most Durable Furnace.

OUR CATALOGUE AND PRICES WILL INTEREST YOU.

MANUFACTURED BY

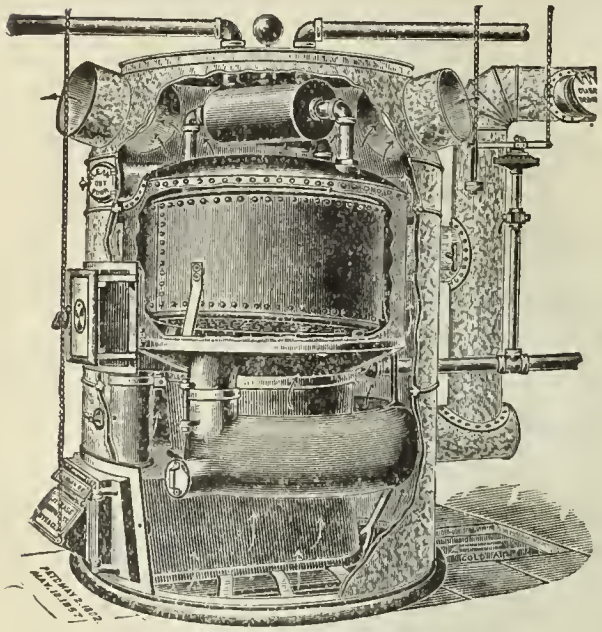
Carton Furnace Co.,

UTICA, N. Y.,

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

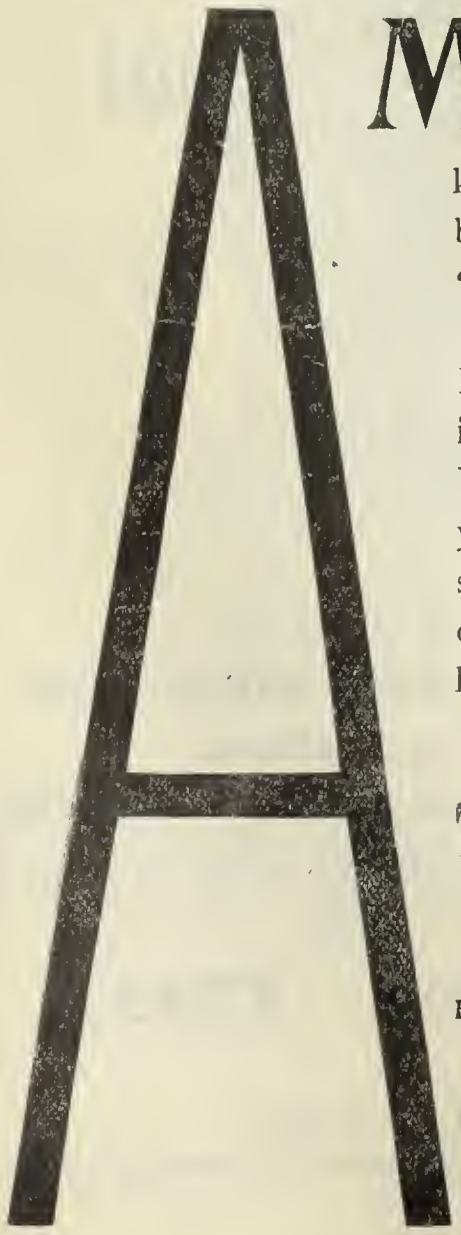
Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

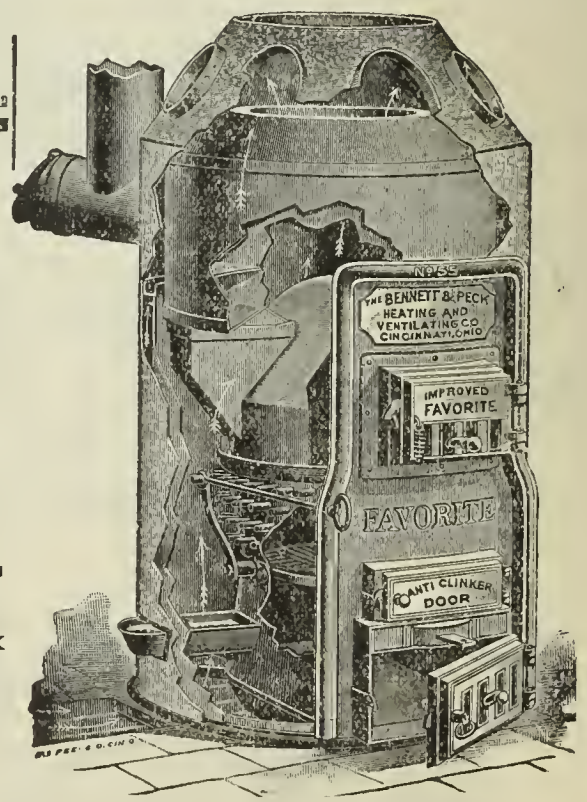
Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.



Man having no

knowledge of the furnace business is likely as not to be gulled by such effervescent statements as "The Best," "The Only," "Guaranteed" and a host of others of like character, but what we want to impress upon the public is the fact that "The Favorite" **is** good, **is** efficient, **is** economical and **is** cheap! What more can you ask? If you'll write we'll make you a special proposition. Will you do it? If so do it now, not later, it may be too late.



The Peck-Williamson Heating & Vent'g Co.

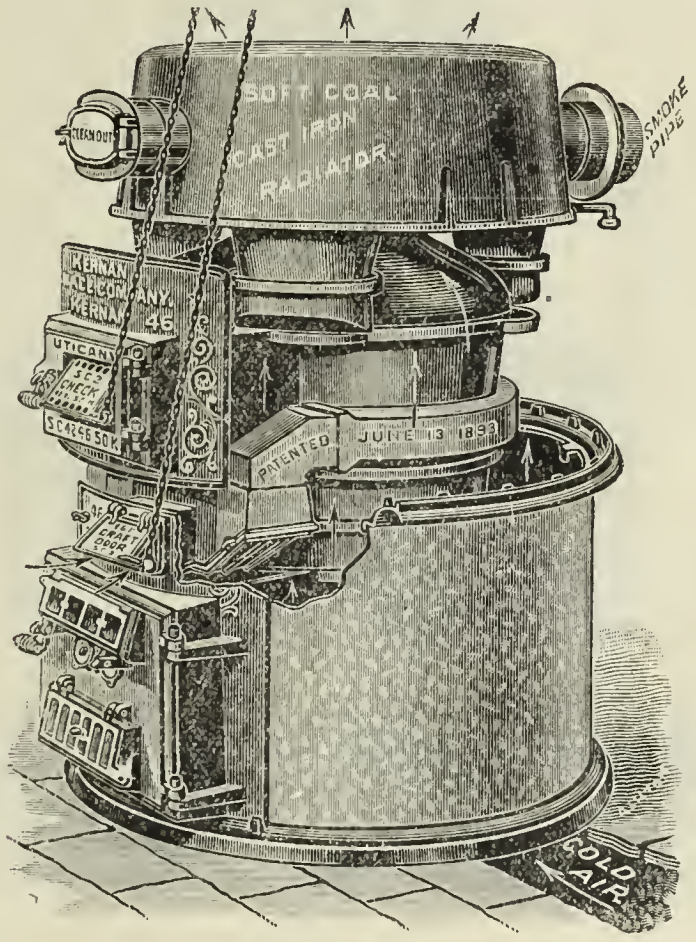
Formerly The Bennett & Peck Heating & Vent'g Co.),

Cincinnati, O.

CHICAGO OFFICE,
82 W. Washington Street.

KERNAN
Smoke Consumers
Lead

In all the sections of the country where soft coal is used.



Now is the time to secure the agency and thereby control the furnace trade of your locality. Do not waste time and money experimenting on new and untried constructions. The

Kernan Smoke Consumers

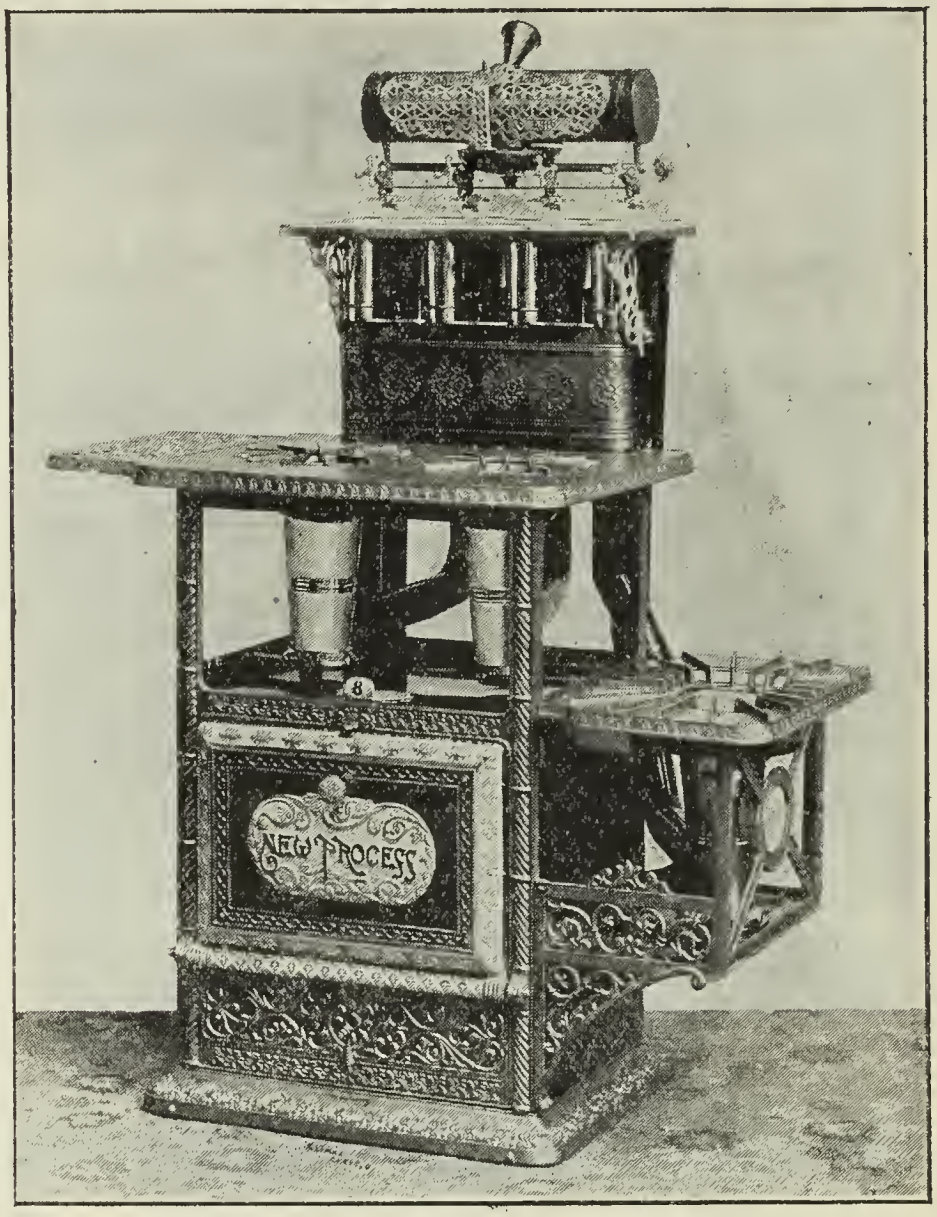
have been used for several years in all parts of the country and with every variety of soft coal and are now conceded by the trade and public to be the only warm air furnace in which soft coal can be cleanly and economically used.

Send for Reference Catalogue of Soft Coal Furnaces.

Kernan Furnace Company,

71 W. Washington St., CHICAGO, ILL. UTICA, N. Y.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

——MADE ONLY BY——

THE STANDARD LIGHTING CO.,
CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La.
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
Milton Rogers & Sons, Omaha, Neb.

DEALERS!

All Weak Points About Vapor Stoves

are not called to your attention by unscrupulous manufacturers or their salesmen. They often palm off imperfect and faulty stoves as perfect, and jolly you into the belief that you have struck a bargain.

But when summer comes and truth comes to light, as it invariably does in the vapor stove business, vexation and disappointment come with it. Vexation, because you have been duped, disappointment, on account of the loss of a season's profit.

Better handle a *good line* at a fair profit than a *poor* line at a *bargain* profit. There is no such thing as a "bargain," especially in the vapor stove business. *Proof*—Review the past ? ? ?

Better buy from a responsible manufacturer or his legitimate jobber, especially of one whose integrity is unquestioned, and one whose knowledge of the vapor stove business secures you an honest deal and prevents the imposition of fakes or shoddy goods. *There are a few of us left.*

Better buy a good line to be successful. A *bad* stove is a very poor purchase at *any* price.

Better look for Protection.

Protection in order to be of service to you must begin at home. See that this point is not overlooked when casting about for a line for 1895.

Better think this over.

The old adage reads, "Make Haste *Slowly*." This is a weighty proverb. The more so when you consider that the best versed manufacturers in the vapor stove industry are not offering any new inventions or innovations for the coming season.

Yours respectfully,

THE SCHNEIDER & TRENKAMP CO.,

479-501 Case Ave., Cleveland, O. 67-69 Lake St., Chicago, Ill.

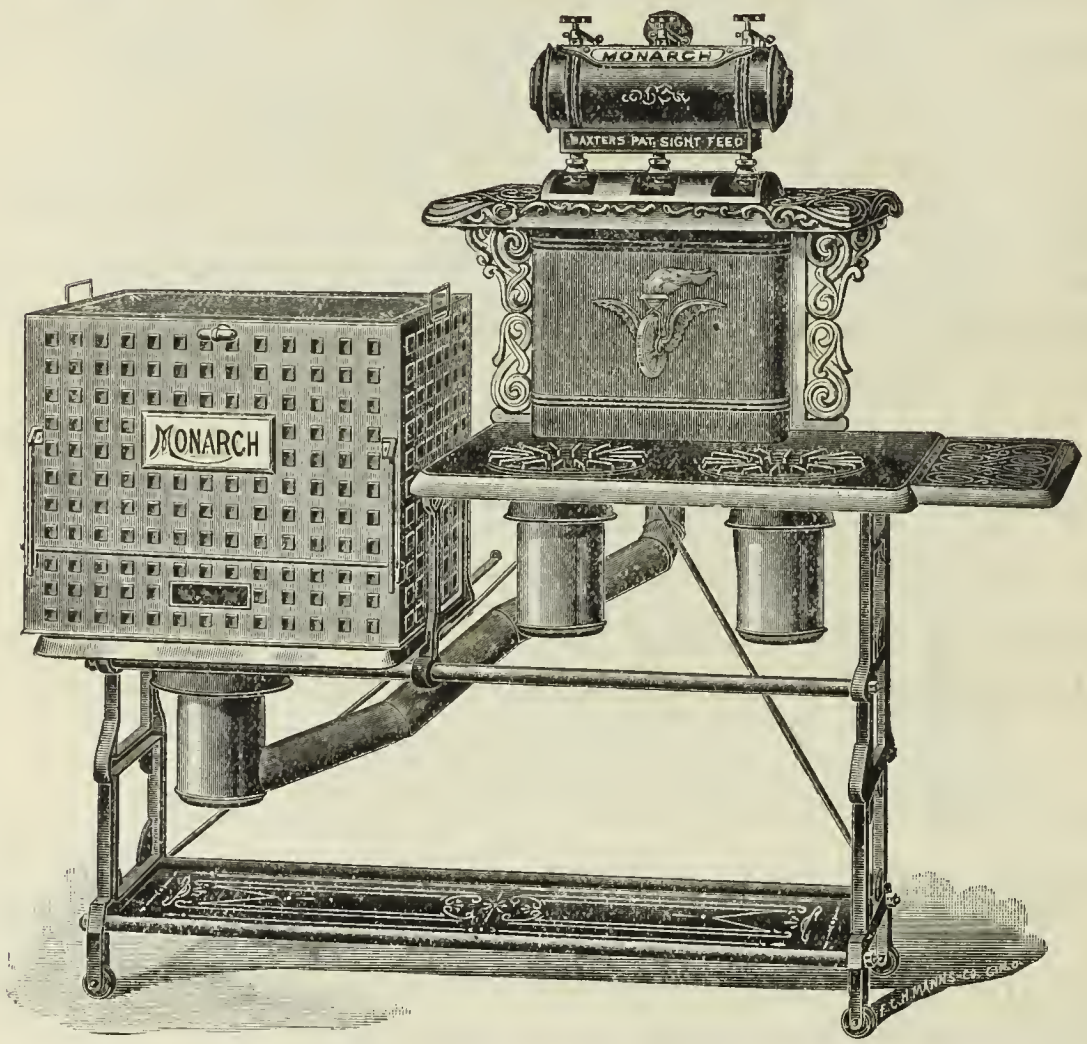
Jobbers Who Will Handle the Reliable for 1895.

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas and Oklahoma Territory.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F. FOX, Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N. CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.



Bow No. 2.

No. 220.



No. 220.

Another Corker.

And yet this is only on the threshold. We're just giving you a peep at the new line for '95. The beautiful new catalogue will show you the entire exhibition if you "drop a card in the slot" with your name on it.

AGENTS:

E. H. HUENEFELD, - - Cincinnati, O.	Ky., Tenn., So. Ohio. So. Ind.
COOK RANGE & STOVE CO., Chicago, Ill.,	Wis., No. Ill.
DANVILLE STOVE CO., - Danville, Pa., and 284-286 Pearl St., N. Y.	Penna. New York. New Jersey, New England.
THE ZAHNER & BATTELL MFG. CO., Kansas City,	Missouri, Kansas.

THE

Monarch Stove Co.,

Mansfield, Ohio.

IROPE

VAPOR STOVES

TWELFTH SEASON

OVER 100,000 MANUFACTURED

NINETEEN DIFFERENT SIZES AND STYLES,

INCLUDING A FULL LINE OF

Evaporating Sheet Steel Vapor Stoves.

Evaporating Cast Frame Cabinet Ranges.

Hot Generating Full Size Stoves.

Hot Generating High Junior Stoves.

Hot Generating Low Junior Stoves.

DON'T BUY A VAPOR STOVE Until you have seen our New Patterns for 1895.

SAMPLES NOW READY AND CATALOGUES FURNISHED ON APPLICATION.

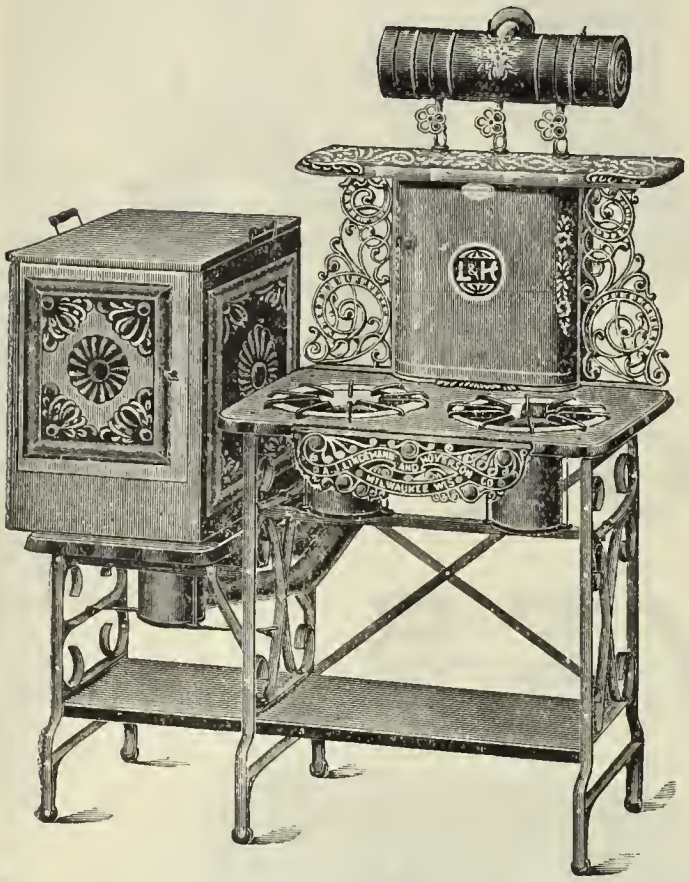
RATHBONE, SARD & CO.,

ALBANY, N.Y. CHICAGO, ILL. AURORA, ILL. DETROIT, MICH.

L. & H. STOVES

FOR

GASOLINE, GAS and OIL. (Kerosene.)



The most Complete Line, Latest Designs, Best Workmanship, Finest Appearance.

Our assortment includes Juniors, Individual Burners, Single Generators, Evaporating Process, Gas Ranges, Hot Plates, Lamp Stoves and Oil Cooking Stoves.

Write for Catalogue and Secure Agencies.

A. J. LINDEMANN & HOVERSON CO., Milwaukee, Wis.

"GOVERNOR" GASOLINE STOVES "PRINCESS"

We are pleased with the prospects of the coming Gasoline season.

Since the Dealers have seen our Stoves and convinced themselves that we manufacture and carry

The Most Complete Line, the Finest Appearing and Best Working Gasoline Stoves,

Inquiries and orders are pouring in on us. This is very gratifying and at the same time nothing unusual, as the intelligent buyer will at all times avail himself of an opportunity to get the best at the same price.

And we certainly insist that our Gasoline Stove is the best in the Market.

Our Illustrated Catalogue is ready and will be sent on application.

Send for Discount and Secure Territory.

Western Stove & Mfg. Co.

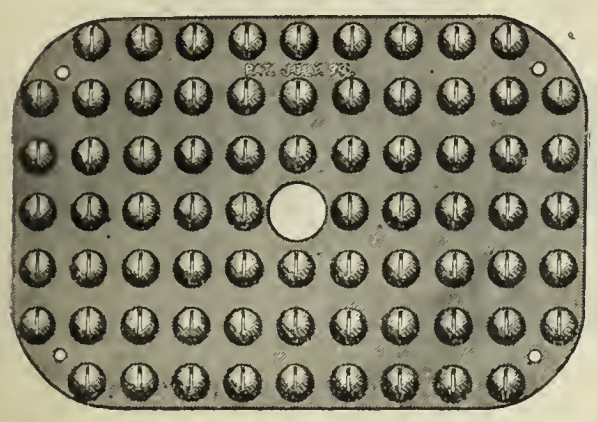
MILWAUKEE, WIS.

CHICAGO OFFICE: Room 73, 88 & 90 Washington Street, T. J. DUFFY, Jr., Sales Agent.



MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*



No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

OUR JET CONE BURNERS distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of
REGULAR
and
SPECIAL JUNIORS.



Simplest, Safest, Best.

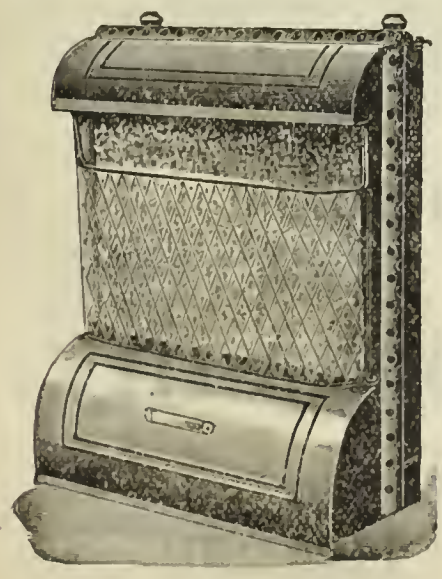
Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



HOW TO REDUCE NATURAL GAS BILLS.
THE "PITTSBURG" GAS STOVE DOES IT.

Pronounced by Experts and Users to be the Cheapest, Best and Most Economical Gas Stove in the market. The secret of its success is not only in burning the gas perfectly, but in preventing any of the poisonous gases (the waste product of combustion) from escaping into the room, and yet extracting all the heat from the gas. **No waste heat passes into the chimney, but only the waste product of combustion.**

By making slight changes in burner this stove can be used for Artificial Gas also. If wanted for such purpose, please order "for Artificial Gas."

Full information cheerfully furnished. Manufactured exclusively and **for jobbing trade only,** by

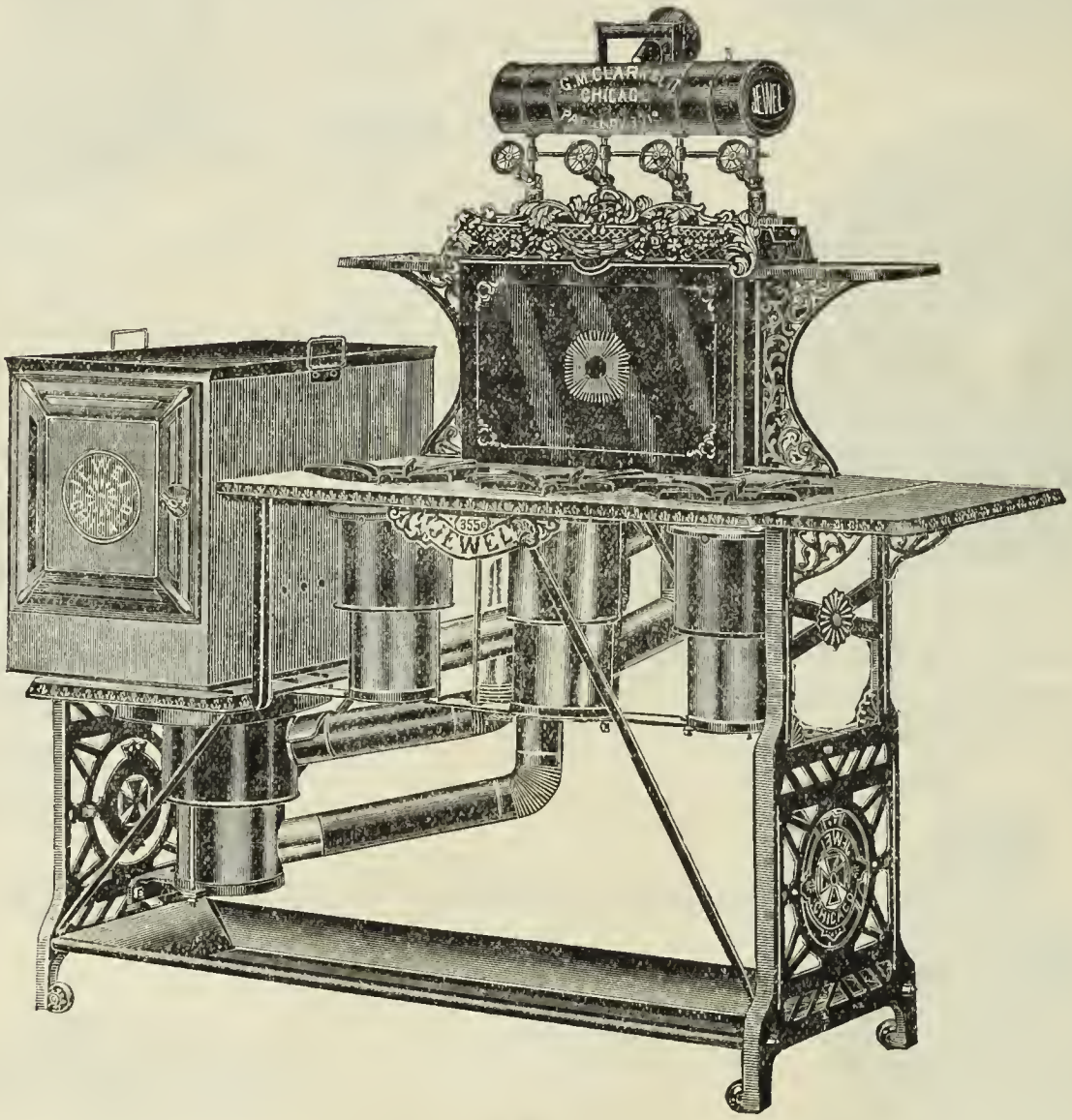
DIXON-WOODS COMPANY, - Pittsburg, Pa.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

CATALOG READY SOON.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

AURORA
Process Stoves

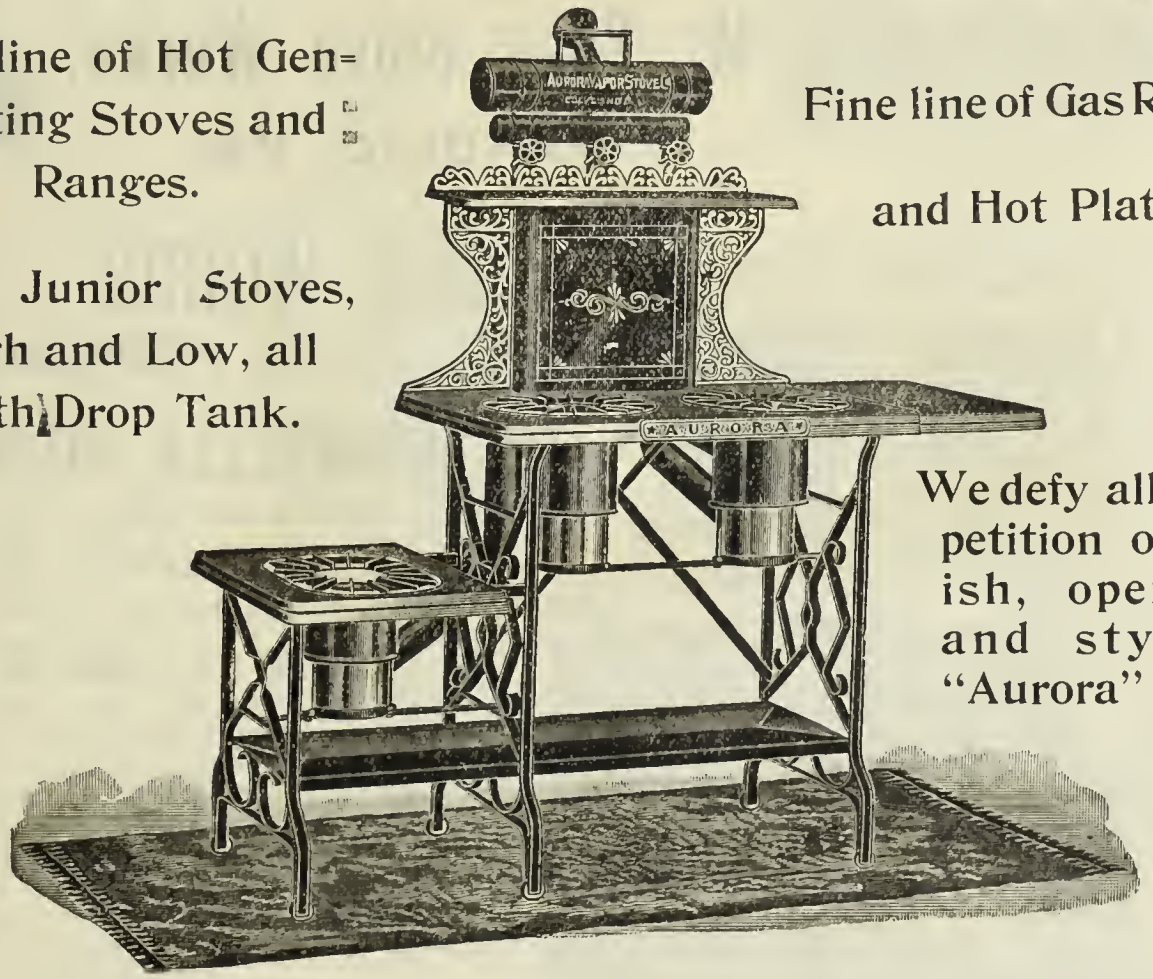
SALES IN 1894 DOUBLED.

Brass Cylinders.
German Silver Points (Rust Proof).
Removable Drip Valves.
Sight Feeds
Ornamental High Shelf Brackets.
Extra Extension Shelf on all Stoves.

"Aurora" is King.

Full line of Hot Generating Stoves and Ranges.

Also Junior Stoves, High and Low, all with Drop Tank.



Fine line of Gas Ranges and Hot Plates.

We defy all Competition on finish, operation and style of "Aurora" stoves

Send for 1895 Catalogue, now ready.

Aurora Vapor Stove Co.,
CLEVELAND, OHIO.

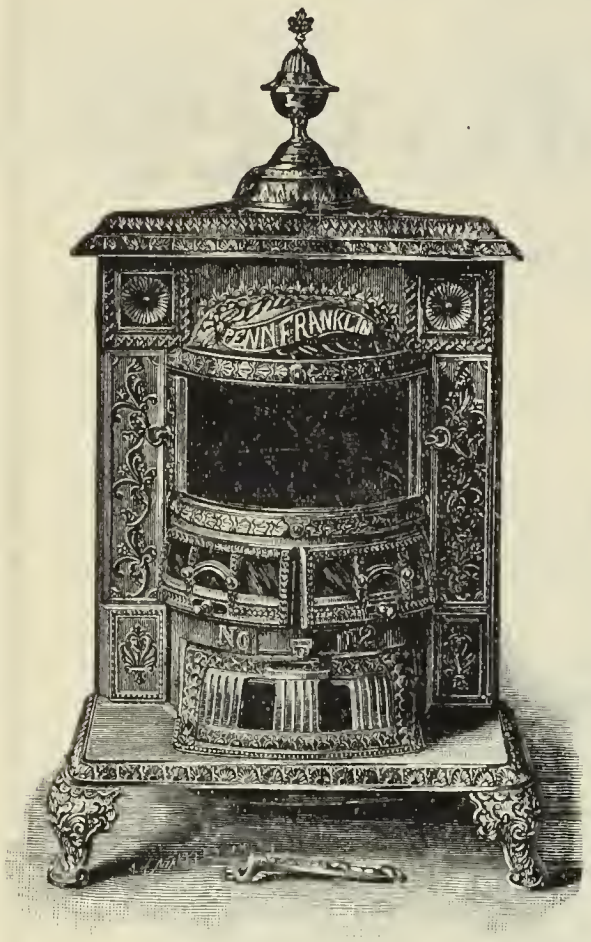
—AGENTS—

THE PERRY STOVE CO., Albany, N. Y. H. W. PEAK, Fort Worth, Tex. JACOB RETTERER, Chicago, Ill.
JAS. BEAKEY STOVE CO., St. Louis, Mo. JANNEY SEMPLE & CO., Minneapolis, Minn.

The

Penn Franklin

MT. PENN STOVES & RANGES READING PA.



Open Parlor Stove.

(Easily Converted into a Natural Gas Stove.)

Just close the mica doors and it can be operated like any round or square parlor stove. Close it up tight and there is no dust when raking. Burns any kind of fuel, and is a strong heater.

Easy to Sell,

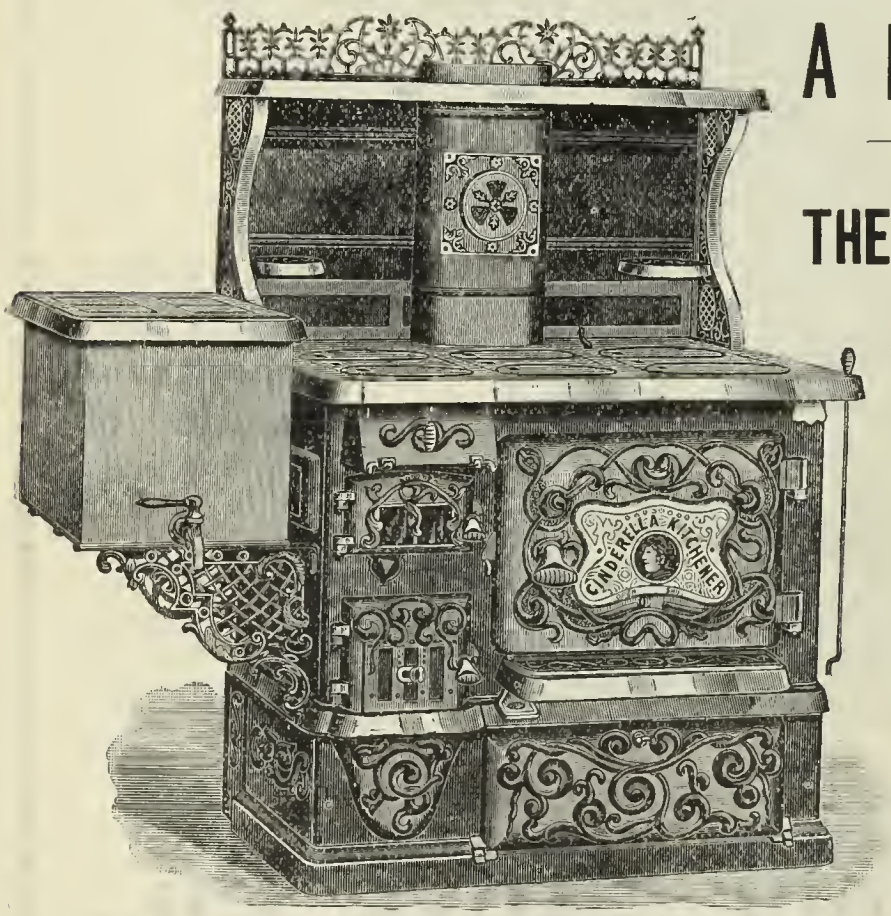
Profitable to Handle.

☞ DROP US A POSTAL FOR PRICES.

Mt. Penn Stove Works,

READING, PA.

MT. PENN STOVES & RANGES READING PA.



The Reservoir is Planished Copper, and holds fifteen gallons.

A FEW WORDS TO THE PROGRESSIVE DEALER.

THE CINDERELLA KITCHENERS

Are an entirely new series of

ALL CAST IRON RANGES,

Adapted for burning

HARD OR SOFT COAL OR WOOD.

They have embodied in their construction many new and desirable features that are thoroughly practical and will meet the approval of the "up to date" dealers. The Cinderella Kitcheners are also made with feet and skirting in lieu of the Low Closet. A full complement of High Shelves and High Closets accompany the same. Every appointment is the latest, and for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No. 716,	Oven 16 x 16,	10½ inches high.
718,	18 x 18,	11½ "
818,	18 x 18,	11½ "
719,	18 x 20,	12½ "
819,	18 x 20,	12½ "
821,	20 x 22,	13½ "
921,	20 x 22,	13½ "

IF YOU ARE INTERESTED WRITE FOR PRICES.

We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

We Would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited, - - Pittsburgh, Pa.

ROUND CLIMAX.



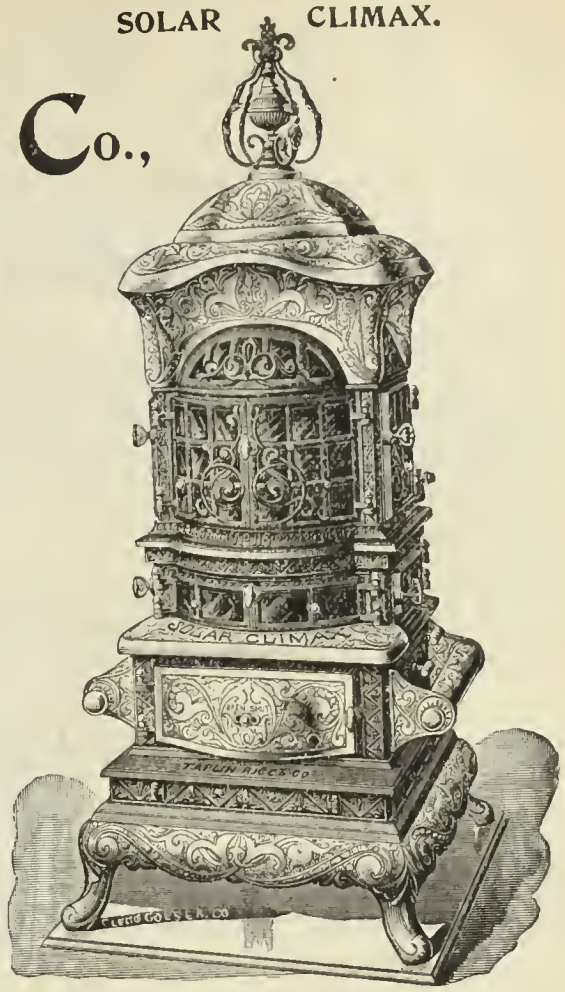
For Soft Coal and Wood.
Three Sizes: Nos. 14, 16, 18.
Single or Double Sectional Fire Pot.

Taplin, Rice & Co.,

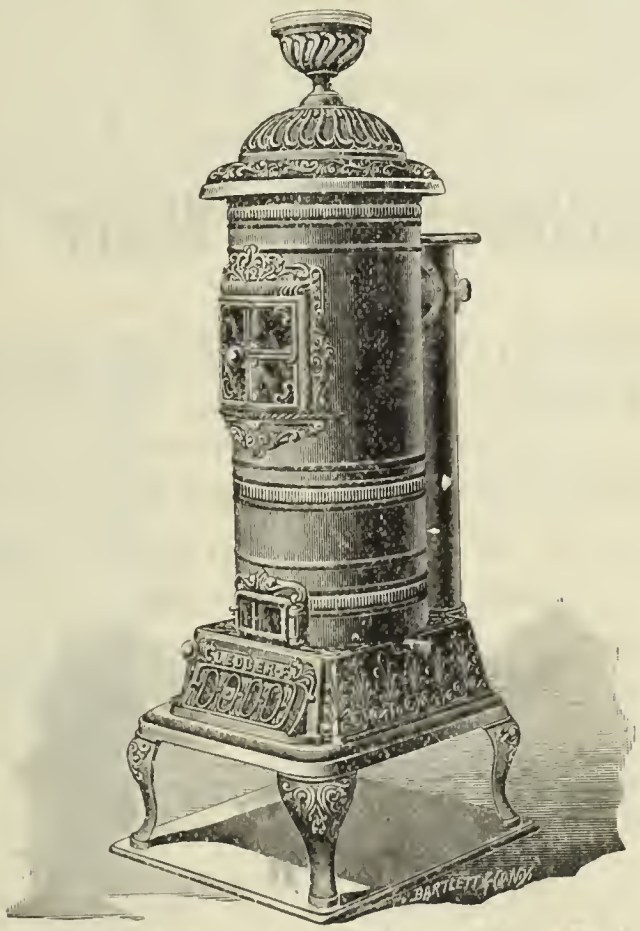
AKRON, OHIO,

MANUFACTURE established leaders in the line of **COOK and HEATING STOVES** and hereby respectfully solicit inquiries and orders for their specialties.

SOLAR CLIMAX.



For Hard Coal.
Three Sizes: Nos. 114, 115, 116.

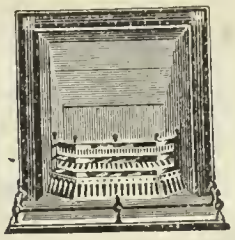


LEDGER F CYLINDER.

WITH REVERTIBLE FLUE. No. 9, No. 10, No. 12, No. 14.

Well made, attractive in appearance and attractive in price. Made both as a plain cylinder and with revertible flue as above. Circulars and prices are worth seeing. Send for them.

THE STAMFORD FOUNDRY COMPANY,
STAMFORD, CONN



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

A Warning to Wearers of Bicycle Suits.

"I have just called, Miss Hainge," said the angry lover, "to say farewell, but before I say it I want you to know that I have discovered your falseness and I despise you for it."

"Why, William, whatever is the matter with you?"

"Oh, you know well enough. Perhaps I didn't pass the gate last evening and see you with your head on another man's shoulder."

"But, William, I haven't seen any man but you, dearest. Honestly, I haven't."

"No, I suppose not. Then maybe I am blind, deaf and dumb and an idiot. Maybe you didn't have company last evening?"

"No one, William, but my friend Winifred. No. I didn't, and I think you are a wretch."

"And you didn't stand at the gate?"

"Oh, yes, we did. We were counting the stars—making wishes of them."

"Oh, yes. I suppose I was blind. Now perhaps you'll describe Winifred to me."

"Why, she had on her felt hat, her black bicycle suit, white shirt front, with a black satin tie and a white duck vest. You know Winifred, William?"

"Um-m, I see," he murmured. And what might have been a modern tragedy was averted, and William made it up on the spot."—*W. J. Press.*

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie. Pa.

"What signifies you Patience, if you can't find it when you want it?"—Franklin.

What signifies that

Ferrosteel produces smooth castings.

Ferrosteel has great strength.

Ferrosteel is not liable to warp.

Ferrosteel has no equal for stove construction.

Ferrosteel Ranges are made of **Ferrosteel.**

Ferrosteel has unusual heat-receiving properties.

Ferrosteel has great powers of expansion and contraction.

Ferrosteel will stand the strain of extra hot fires without giving out.

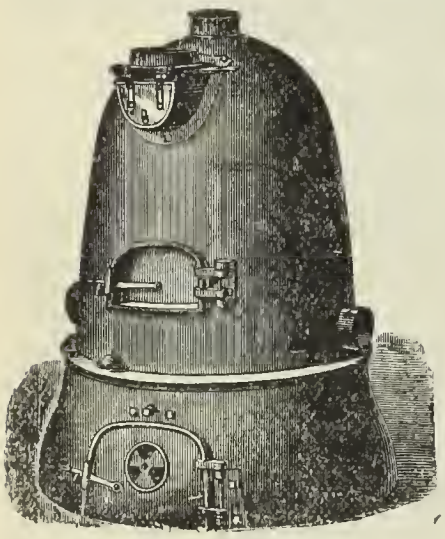
If you never see a range made of **Ferrosteel?**

Additional Sizes for 1895.

Please write for particulars to

THE FERROSTEEL COMPANY,
Wade Building,
106 & 108 Superior Street,
CLEVELAND, OHIO.

Model Works at
CHAGRIN FALLS, OHIO.
(10 Miles from Cleveland.)



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET; - - - - - NEW YORK

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than **any** heater in the market. Hundreds are in use and doing good service that were put in **25** years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

OXFORD PERFECT BLAST FURNACES.

CONSTRUCTED WITH A

POSITIVE WORKING AIR BLAST

AND

UTILIZING INDIRECT CURRENTS

TO INCREASE HEATING CAPACITY.

SEND FOR NEW CATALOGUE.

CANTON. HEATERS.

TRADE MARK.

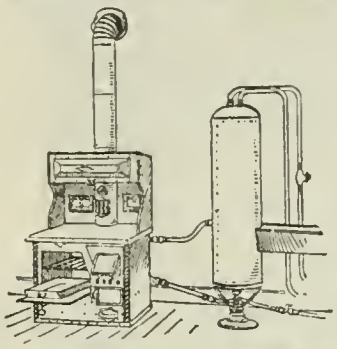
THE J. H. McLAIN COMPANY, - Canton, Ohio.

NEW YORK, 69 Centre Street.
CHICAGO, 88 Lake Street
DENVER, 1525 Champa Street,
SAN FRANCISCO, 5 Crocker Bld'g.

★ STAR WATER BACK AND BOILER ★
COUPLERS.

DONT WIPE YOUR JOINTS — SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

NO SOLDER NO BURST — ANY MECHANIC CAN DO IT

WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.
Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada.

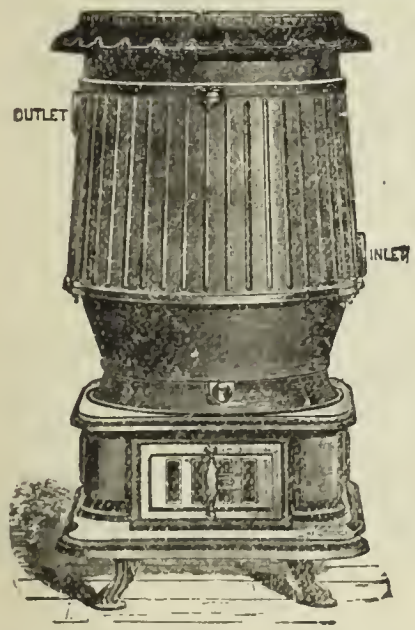
ROYAL HEATERS.

SOLD ON THEIR MERITS. NOT ON THEIR ANTIQUITY.

HOT WATER. STEAM. HOT AIR. COMBINATION.

LARGEST ASSORTMENT OF STYLES AND SIZES.
CATALOGUES GIVE FULL DESCRIPTION.
CORRESPONDENCE SOLICITED.

MANUFACTURED BY
HART & CROUSE.
UTICA, N.Y.
NEW YORK. 211 WATER ST.
CHICAGO. 79 LAKE ST.



Clad's Hot Water Stove.

PRICE-LIST ON APPLICATION.

V. CLAD & SONS,

MANUFACTURERS OF

French Ranges and Broilers,

117-119 South Eleventh St.,

Philadelphia.



WHY IS IT
that the same dealers who sold the **Boomer Furnace** five years ago are still continuing its sale?

DID YOU EVER STOP TO THINK
that one or two years' experience with a poorly constructed light furnace always creates a demand for a furnace that has proven to be the best in the full sense of the word?

IF YOU WANT TO MAKE MONEY
buy the Improved Boomer Furnace, set it up right, please your customer, and you have the key to your future success.

REMEMBER
that a Boomer Fire Pot has never been known to crack or burn out. That it has the simplest and most effective Gas and Smoke Burner. Guaranteed the heaviest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS. Massillon, Ohio.

Ocean Depths.

Murray and Penck had made calculations by variations of the first method, and got out the mean depth of the oceans as 3797 meters (2074 fathoms), and 3650 meters (1995 fathoms) respectively. Heinrich, by the second method, got 3438 meters (1881 fathoms), and Krümmel, by the third method, gave the figures 3320 meters (1815 fathoms). Since Krümmel's calculations were made, in 1886, his student, Karstens, has gone over them, taking advantage of the very numerous additional soundings which have been made, and he comes to the conclusion that the average depth of the oceans, as a whole, is 3496 meters, or 1909 fathoms. The maximum probable value was 3632, and the minimum 3377 meters. The mean depth of the Pacific Ocean is given as 3829 meters, of the Indian Ocean 3593 meters, and of the Atlantic Ocean 3160 meters.—*Nature.*

— "Who was Washington's father, Jack?" asked the teacher.

"The grandfather of his country," replied Jack.—*Harper's Young People.*

— "So it's all over between us, is it, Laura?" asked George, fiercely.

"Yes, George, it is over," replied Laura. "I would'nt have minded your flirting with all the girls some of the time or with some of the girls all the time, but I object to your flirting with all the girls all the time. Here is your ring."—*Chicago Tribune.*

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of these best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student, and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

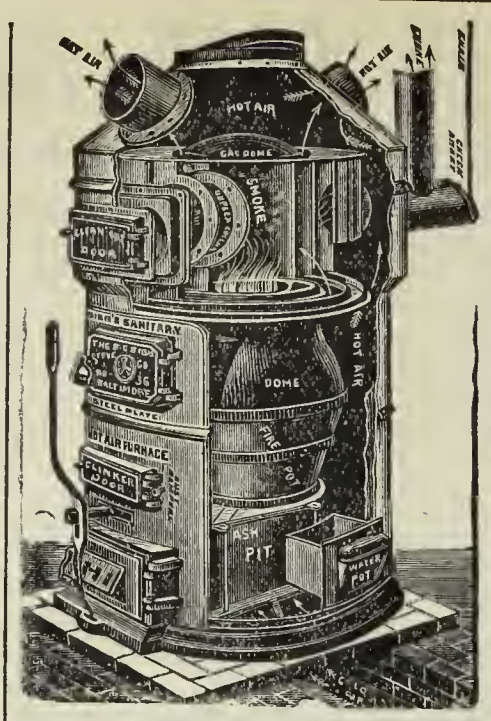
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher.

96-102 Reade St., New York.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

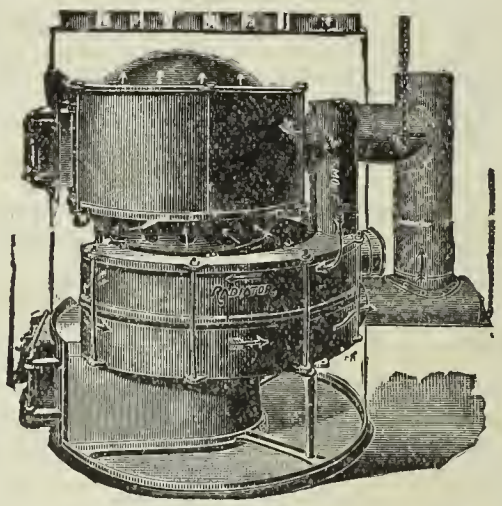
Baltimore Fire Place Heaters,

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.

DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

It Is a Base Burner.
It Is a Great Economizer of Fuel.
It Does Not Heat the Cellar
It Is a Low Furnace.

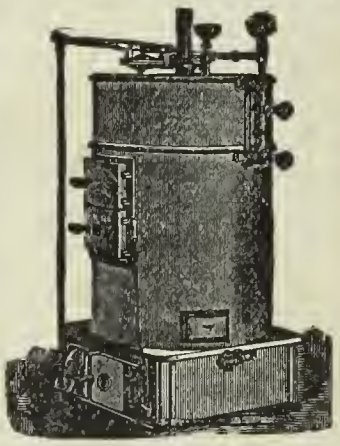
The "Perfect" Ventilator

The "Crown" or "Stasch" Folding Bake Pan.

Agents Wanted. Address—

The CORNING MANUFACTURING CO.,
CORNING, N. Y.

"JUST A LITTLE"



FUEL, TIME, CARE } TO { RUN IT. SET IT UP. MANAGE IT

That's all, and how it does heat!

WHAT? Why, the "PACE."

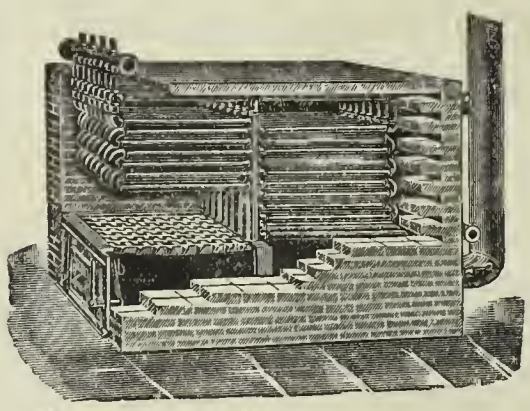
Further information will cost you the time of writing for our catalogue—it's worth it.

W. C. MOWRY, Lock Box 314, NORWICH, CONN.

The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.



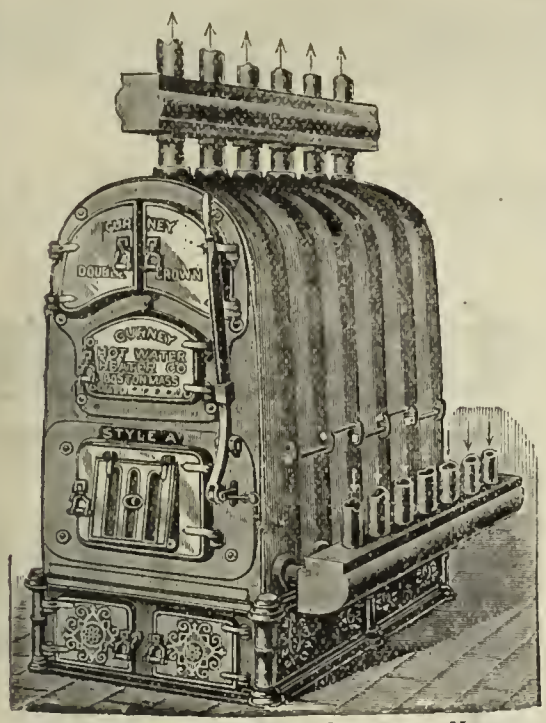
MANUFACTURED IN

Over 300 Different Sizes.

SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
15, 17, 19 ACHILLES ST., **ROCHESTER, N. Y.**
New York Office, 44 Dey Street.



Gurney "Double Crown" Hot water Heater.
Style "A."

RESULTS ARE CONVINCING EVIDENCE.

THE GREAT SUCCESS WHICH

Gurney

HOT WATER HEATERS, STEAM BOILERS, RADIATORS,

Have attained is due to the **FACT** that they embody

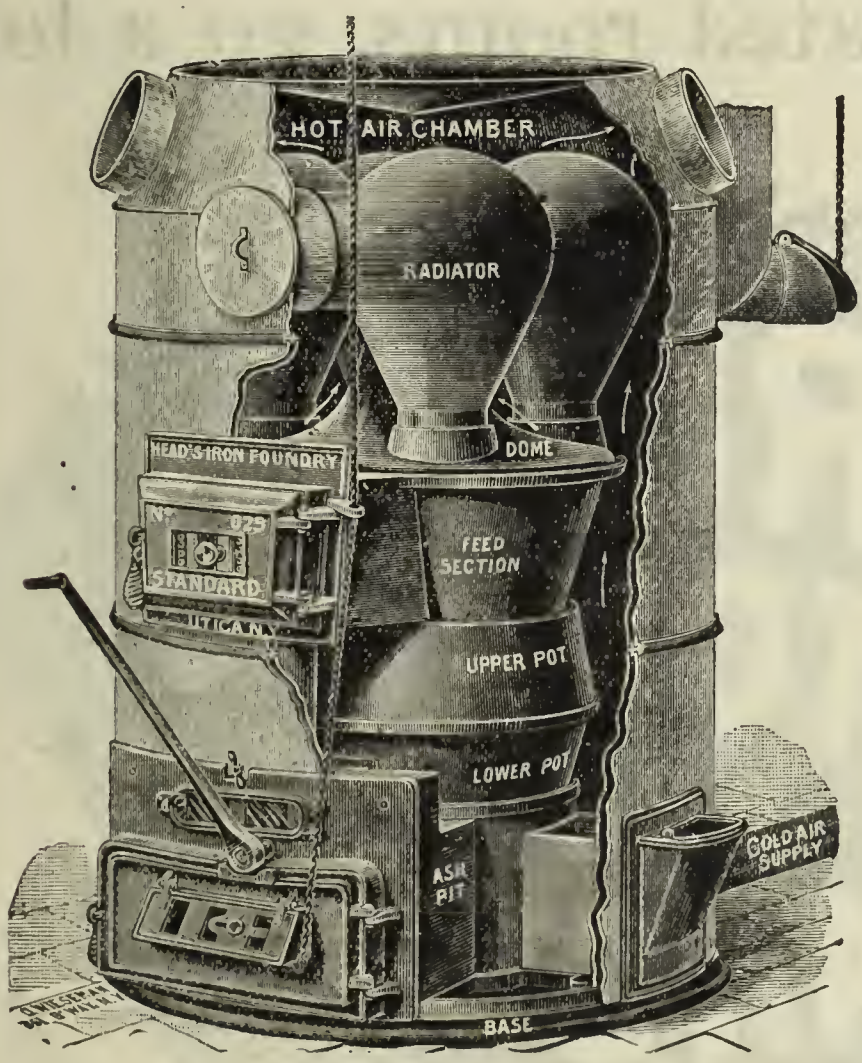
BEST

WORKMANSHIP,
CONSTRUCTION,
MATERIALS,
ADAPTABILITY,
IDEAS.

ALWAYS EQUAL TO THE OCCASION.

Send for Catalogues.
Sold only to the Trade. **GURNEY HEATER MFG. CO.,** 163 Franklin St. Cor. Congress, Boston, Mass

Selling Agents, A. A. Griffing Iron Co., 34 Dearborn St., Chicago, Western States.



Cold Houses

ARE NOT

Conducive to

Good Nature.

One can have **SUMMER** indoors with **ZERO** outside by using

THE STANDARD FURNACE.

Has all the modern **Equipments.** *Satisfies Everybody.*

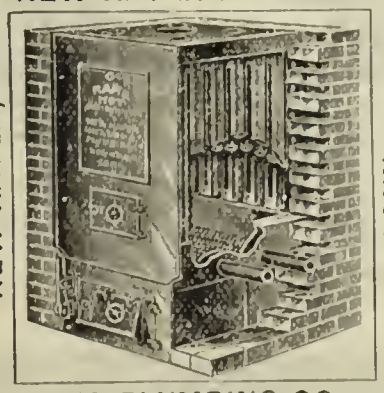
THE DEALER CAN GIVE AN

Unqualified Guaranty

with every one sold. It will not disappoint either seller or buyer.

GIBLIN & CO., Utica, N. Y.

NEW HAVEN HEATING



NEW HAVEN, CONN.

AND PLUMBING CO.

Rapid Hot Water Heater,

Selling rapidly to the Trade only.

MONEY IN IT FOR YOU.

Send for Catalogue, Price-List and Discount.

There's much tru

"The way to a ma

is thro

hence well-prepared and proper
fortably-heated rooms, go a long
happiness.



th in the saying:

n's heart

ough his stomach,"

y=cooked food, as well as com= way towards making domestic

It is poor economy to buy a cheap rticle (especially one so seldom bought uring a lifetime as a stove), for price and uality generally correspond.

"Garlands" cost no more than other first=class oves, while the advantages they possess and facili= s offered for marketing them are much greater than ose of any other goods of their kind made.

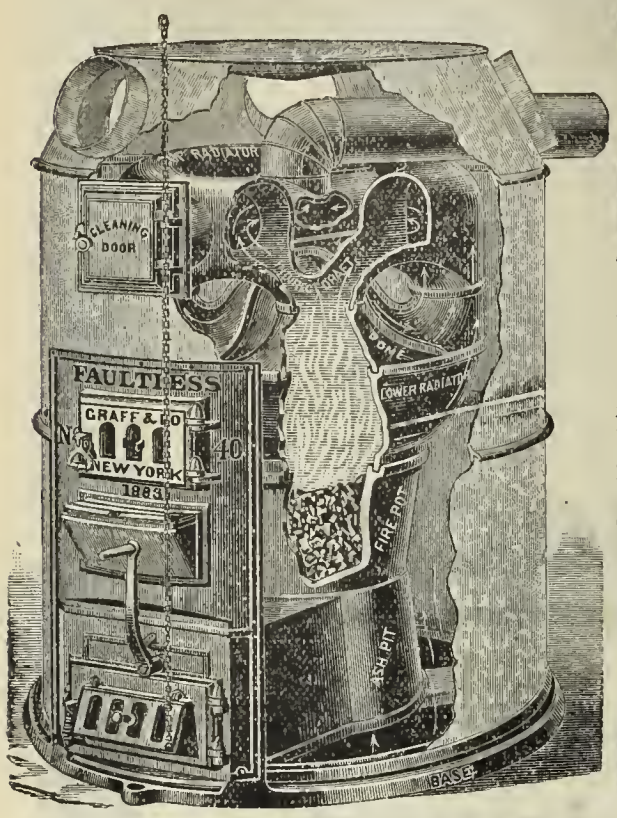
"Garlands" are made in every desirable size and yle, for all kinds of fuel, but of only one grade—the ry best.

The Michigan Stove Company,

Largest Makers of Stoves and Ranges in the World.

ROIT, CHICAGO, BUFFALO, NEW YORK CITY.

FAULTLESS.

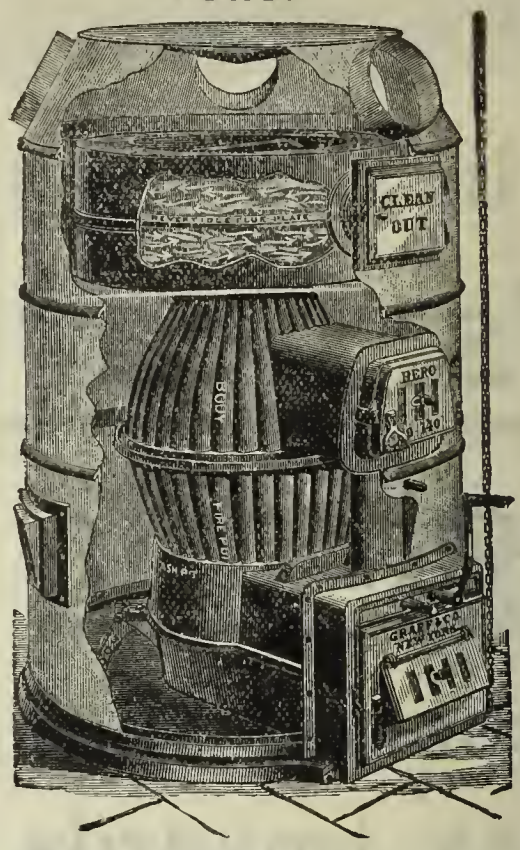


YOU WANT THE BEST FURNACE

That you can buy, and we have got it. You will not be disappointed in any selection you may make from our assortment of

FURNACES OR RANGES.

HERO.



SMITH & BRIGHT,
175-177 Lake St., Chicago, Ill.

GRAFF & COMPANY, Manufacturers,
208 Water Street, New York.

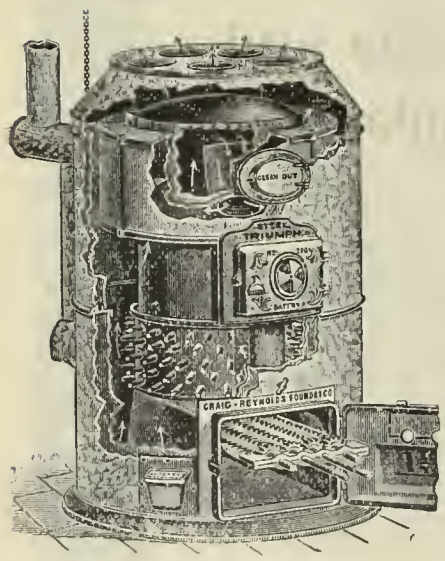
—THE—
Craig-Reynolds Fdy. Co.,
DAYTON, O.,
Founders,

AND

GEO. D. HOFFMAN,
Mgr. Western Branch,
82 LAKE STREET, CHICAGO,

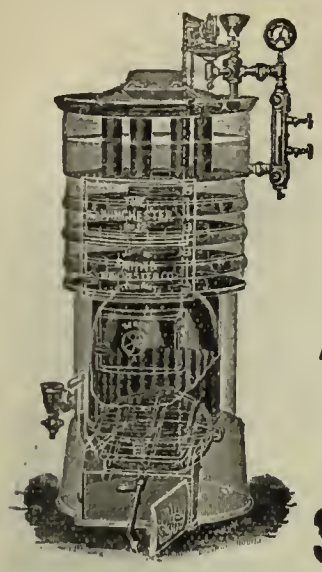
Mfrs.
The
TRIUMPH
Furnaces.
"There are none better."

Wish all Dealers



A Happy and Prosperous New Year.

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



The Winchester



Has more COMMENDABLE

And less OBJECTIONABLE FEATURES

Than any Heater on the Market.

——MADE BY——

SMITH & WINCHESTER CO., Boston Mass.

Our prices on these Heaters will please you. Send for them.

KEEP IN MIND



The Plummer

Steam Heater

AND

The Leader

Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,

PUTNAM, CONN.

THE MAHONY BOILERS.



For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

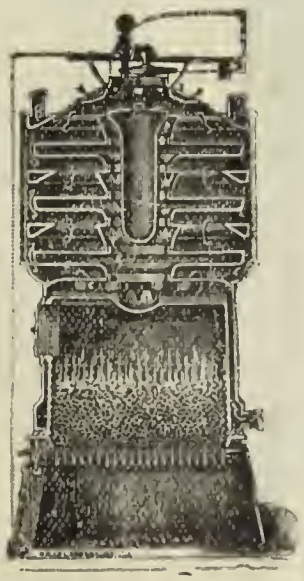
M. MAHONY, - Troy, N. Y.

THE VOLUNTEER

STEAM



SECTIONAL VIEW, Hot Water.



For hot water or steam has no superior, and is the only hot water boiler that is **SELF REGULATING.**

Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Stree'.

War's Perfectly Outrageous Front.

"He was a cool man, was the Colonel of my regiment," remarked a long-legged old chap to a militia youth in a great display of uniform. "I never seen his like."

"Was it in the late war?" inquired the youth.

"The same, and he was the dandyfiedest little fellow you ever see. That's the reason I don't laugh when I see you fellers," added the old one, encouragingly. "Clothes ain't no sign of what kind of a soldier is inside of them."

"Thanks."

"Don't mention it. As I was saying, my colonel was the coolest man you ever see. Down there before Richmond once, when he was only a captain, he had his company covering a hill that was in the range of the enemy's shells, and they was dropping them there thicker'n potaters. He had on a brand new uniform, and was looking like a beau on parade, but he stood right out where the shells was ploughing up the ground all around him and throwing dust over everything, but he never moved except to knock the dirt off his clothes about every minute. After a while the general in command sent for him to come back out of range behind the hill-top.

"'What do you think of it?' asked the general, meaning the outcome of the fight.

"'It's perfectly outrageous, general,' says the captain, 'and I don't see why in thunder they don't throw whisp brooms with their shells.'"—*N. J. Press.*

Keep at it.

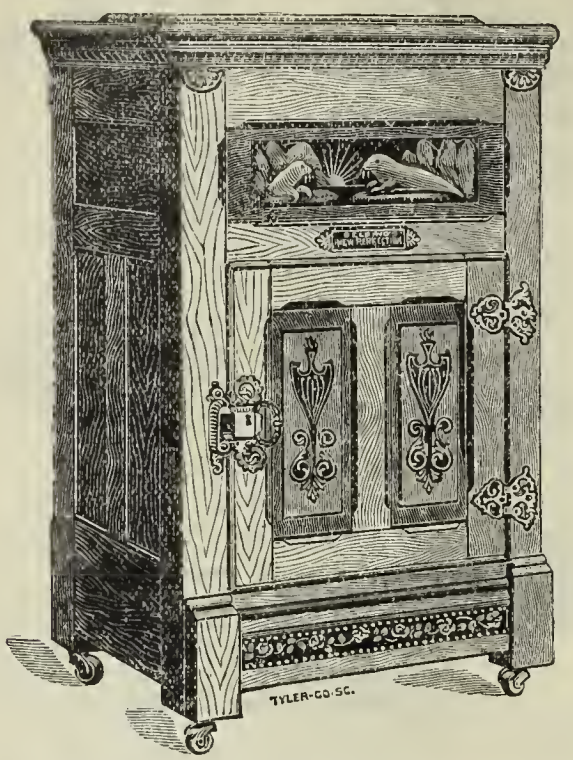
If you expect to conquer
In the battle of to day,
You will have to blow your trumpet
In a firm and steady way.
If you toot your little whistle
And then lay aside the horn,
There's not a soul will ever know
That such a man was born.

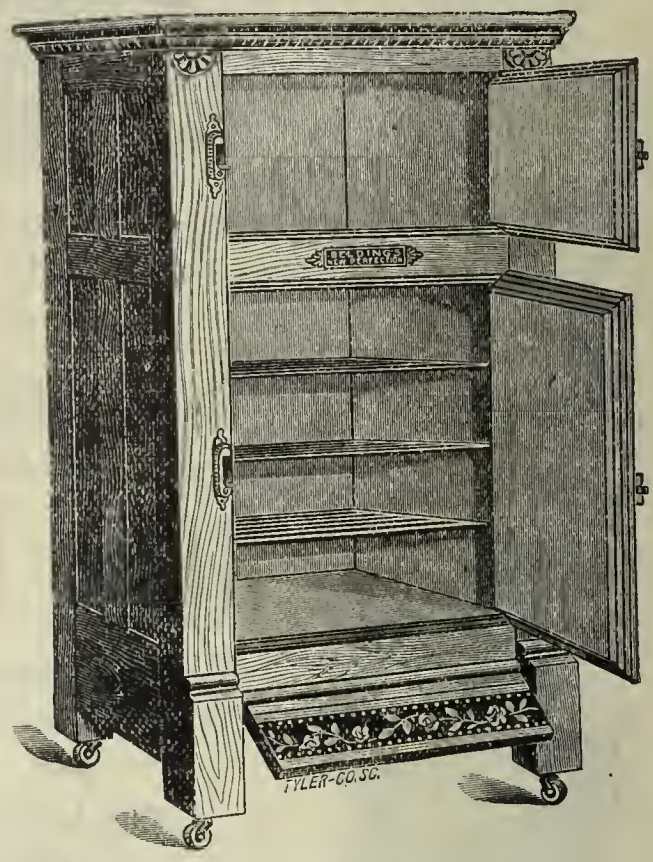
The man that owns his acres
Is the man that plows all day;
And the man that keeps a humping
Is the man that's here to stay.
But the man that advertises
With a sort of sudden jerk
Is the man that blames the printer
Because it didn't work.

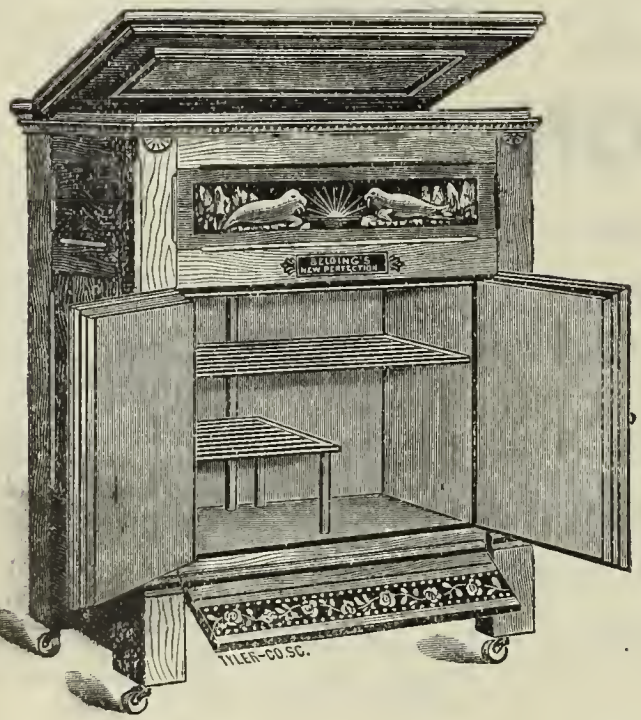
But the man that gets the business
Uses brainy printers' ink,
Not a clatter and a sputter,
But an ad. that makes you think;
And he plans his advertisements
As he plans his well-bought stock,
And the future of his business
Is as solid as a rock.

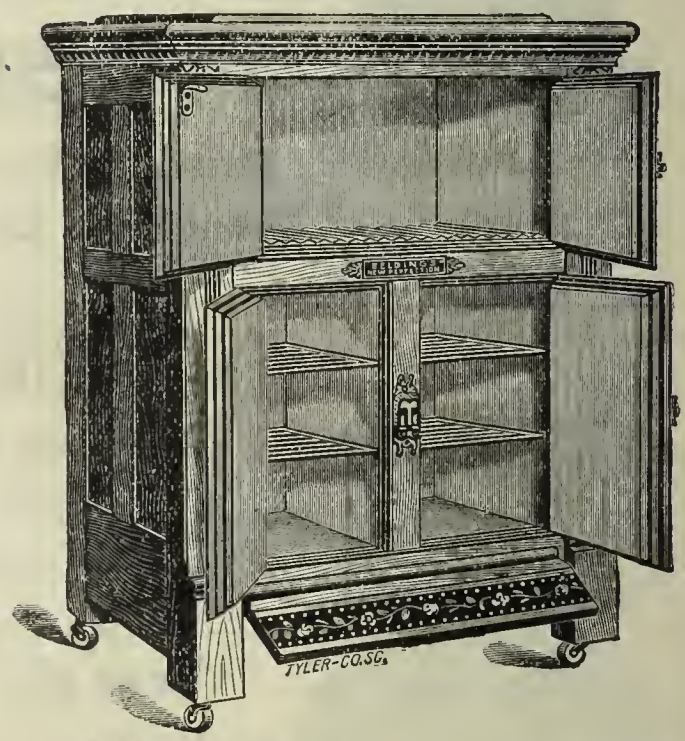
Printer's Ink.

BELDING'S REFRIGERATORS.

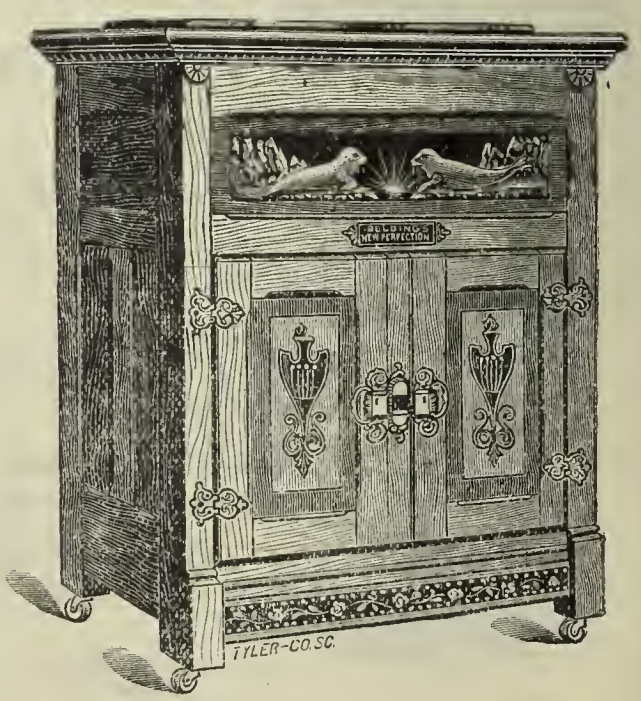




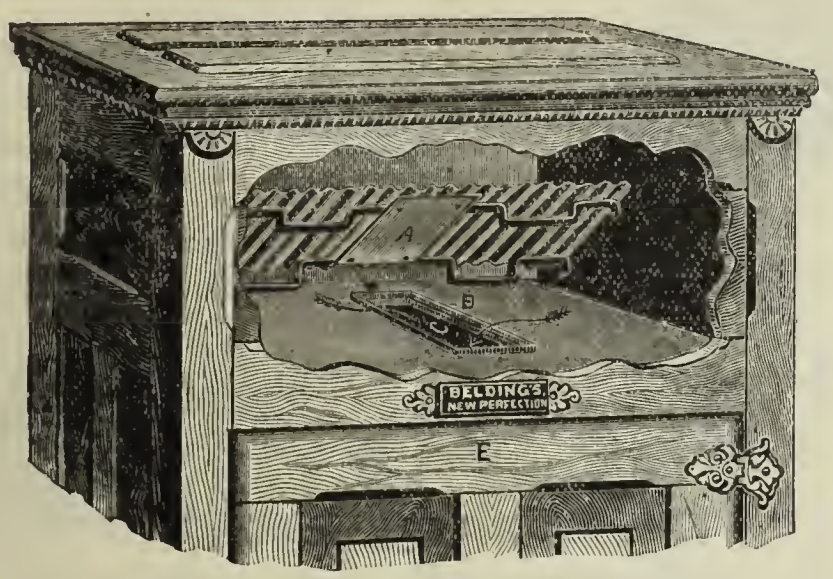




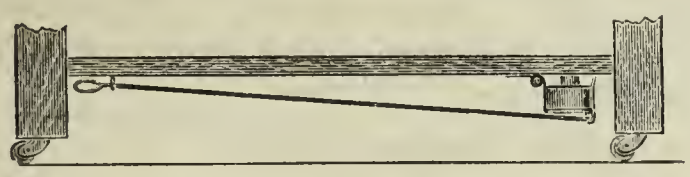


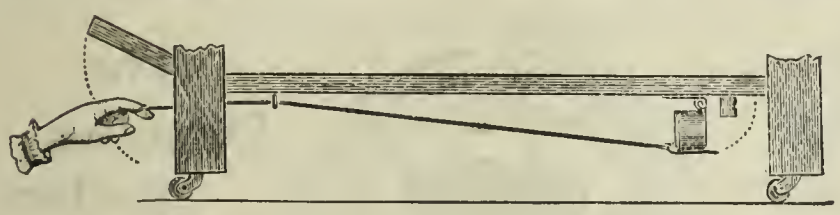


See Points of Excellence Over Others.



Patent Applied For.





OUR NEW AUTOMATIC COLD AIR DAMPER ATTACHMENTS.

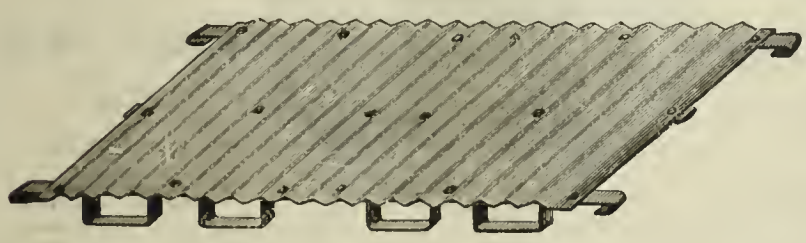
This cut shows a section of our Refrigerator with the New Automatic Cold Air Damper closed.

A—Represents Metal Ice Rack.
B—Bottom of Ice Compartment.
D—The **New Automatic Cold Air Damper.**
E—Door of Provision Chamber.

When the door of the Provision Chamber is opened the Cold Air Damper *immediately* closes the opening through which the cold air drops, thereby *instantly stopping the circulation* in the Refrigerator. Then, as the cold air in the Ice Compartment *cannot escape*, it is impossible for warm air to enter it through the flues in the sides of the Refrigerator; therefore, while the door of the Provision Chamber is open *no ice is wasted, no cold air escapes* and *no warm air enters* the Ice Compartment or *comes in contact with the ice.*

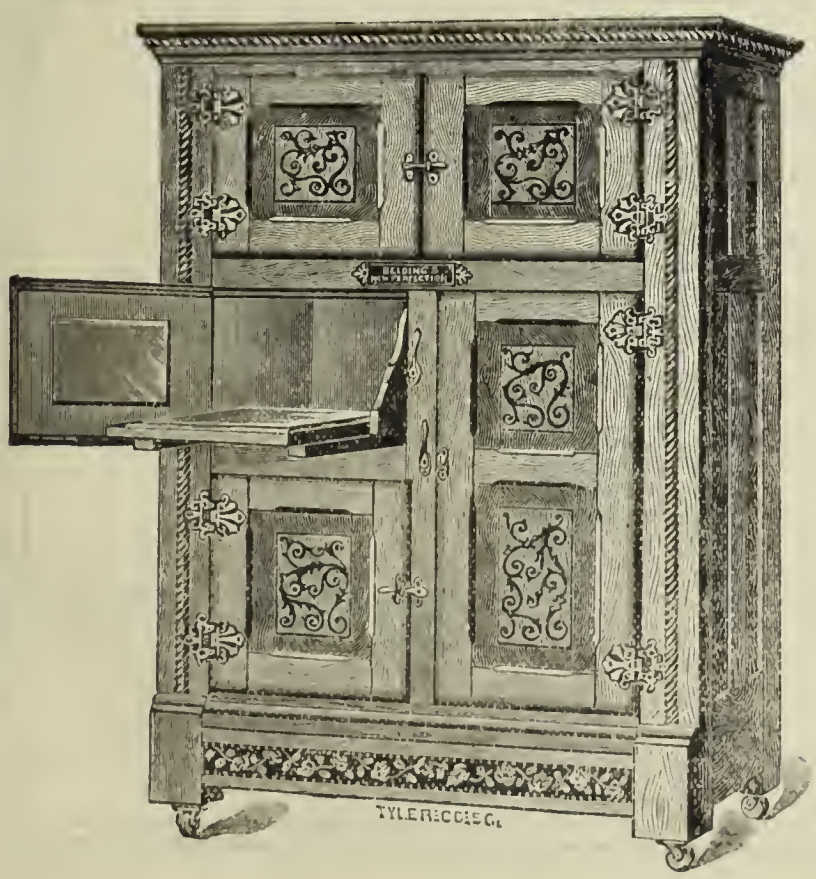
Thus it is clearly shown that this improvement is a *practical* one and makes our Refrigerators *consume less ice* than any that are now on the market.

OUR NEW DRIP CUP ATTACHMENT.



SOLID METAL ICE RACK.

No wood cleats to get water soaked and tainted.



All refrigerators **hardwood, antique finish.** We carry large stocks at all of the following places:

Belding Manufacturing Company.

Factories, Belding, Mich.

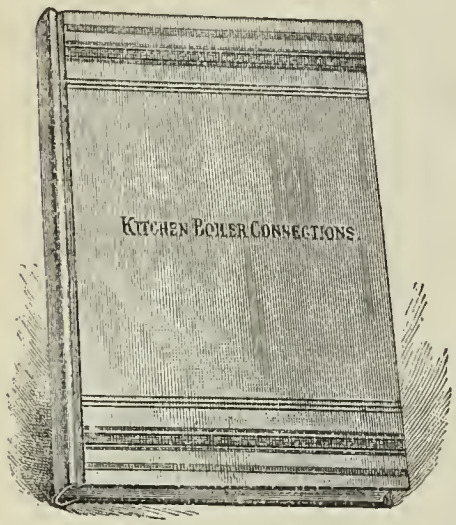
SALESROOMS AND WAREHOUSES:

Chicago, 223 5th Avenue.
New York, 260 Canal Street.
Philadelphia, 249 So. 2nd Street.
Boston, 90 Canal Street.
Holbrook, Merrill & Stetson, San Francisco and Sacramento, Cal., Pacific Coast Agents.

SEND FOR ILLUSTRATED CATALOGUE.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth, Price, $1.00

The book is well got up and the information well given Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

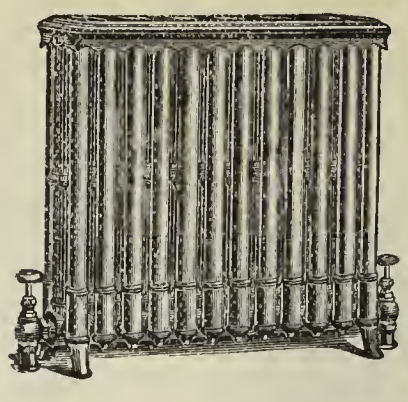
Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK



THE H. B. SMITH CO.

Manufacturers of STEAM AND WATER

Heating Apparatus,

For Public and Private Residences.

SPECIALTIES:

THE UNION AND ROYAL UNION HOT-WATER RADIATORS.

GOLD'S IMPROVED SECTIONAL BOILERS

MILL'S SAFETY SECTIONAL BOILERS.

REED'S IMPROVED CAST IRON RADIATORS

GOLD'S INDIRECT PIN RADIATORS.

BRECKENRIDGE'S PATENT AUTOMATIC AIR VALVES.

Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for Hard or Soft Coal.

Office and Warerooms: 137 Centre St., New York.

Union Radiator. Catalogues sent on application. Foundry, Westfield, Mass.

STEAM HOT WATER WARM AIR FOR HEATING ALL CLASSES OF BUILDINGS

CAPITOL HEATERS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.

DO NOT CUT THIS OUT, FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers Are the Best —FOR— Steam or Hot Water Heating.

—o—

Send for Catalogue.



The Dunning Boilers ARE MADE OF Wrought Iron or Steel AND HAVE NO Packed Joints.

The Portsmouth Stove and Range Co.,

Portsmouth, O.,

beg to inform the trade that they have purchased all the soft coal Retort "DENMARK" Patterns of the Ransom Stove Works, Albany, New York, and all the "LION" Retort Patterns of the Favorite Stove & Range Co., Piqua O.,

Makers of The Celebrated "Model" Steel Ranges,

and now own all the patents covering these constructions, and will have some novel things in heaters ready for the trade next fall, based on this method of burning soft coal.

Repairs for both of these stoves can now be purchased from us.

IMPORTANT ANNOUNCEMENT.

To Our Patrons and the Trade Generally:

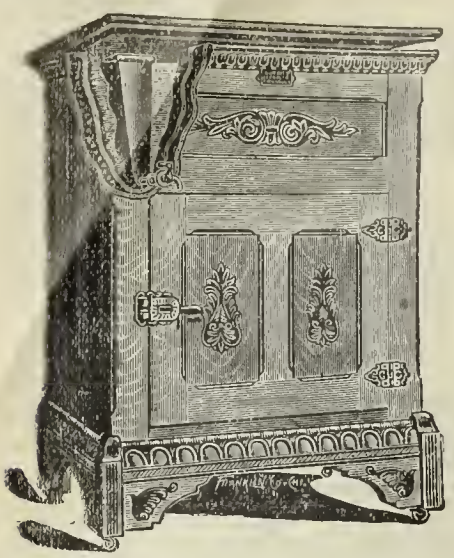
Our new Catalogue for 1895 will be ready for distribution within a few weeks. We take this means of announcing in advance of its publication that we have very carefully studied the requirements of the trade in every particular, and that our lines will be complete. We will place on the market specialties in entirely new goods that will commend themselves both by reason of popular prices and their many attractive and desirable features. In addition to our very popular Oilgas Cook Stoves, containing our improved 1895 Burners that are giving such perfect satisfaction, we have something entirely new in the line of special Lamp Stoves at special prices; also Sheet Steel Circular Burner Oil Cook Stoves. Write for further information and prices.

CENTRAL OILGAS STOVE COMPANY,

—Manufacturers of—

Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes.

BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.



No. 102 Refrigerator. Frout sectional view, showing position of Removable Galvanized Ice Compartment, Mineral Wool Packing, Etc.

Gurney Patent REFRIGERATORS.

WE CLAIM FOR THE "GURNEY:"

"REMOVABLE GALVANIZED ICE COMPARTMENT."
"THE ONLY CLEANABLE REFRIGERATOR."
"CAN BE KEPT ABSOLUTELY PURE AND CLEAN FOR ALL TIME."
"THE LOWEST AVERAGE TEMPERATURE."
"THE GREATEST ECONOMY OF ICE."
"DRY AIR FREE CIRCULATION"
"PACKED WITH MINERAL WOOL (the best non-conductor.)"
"THE GREATEST SELLER."

The "Gurney" Proves what we Claim.

The following Jobbers will handle the Gurney for the Season of 1895:

S. M. Howes & Co., Boston, Mass.
A. W. Martin, Baltimore, Md.
Supplee Hardware Co., Philadelphia, Pa.
Bindley Hardware Co , Pittsburgh, Pa.
Frank Diel, Syracuse, N. Y.
McIntosh-Huntington Co., Cleveland, O.
Indianapolis Stove Co., Indianapolis, Ind.
Chicago Stove & Range Co., Chicago,
Freeman Delamater & Co., Detroit, Mich.
Robert Seeger, St. Paul, Minn.
A. J. Lindemann & Hoverson Co., Milwaukee, Wis.
King Hardware Co., Atlanta, Ga.
O. K. Stove & Range Co., Louisville, Ky.
Heckel Hardware Co., St. Louis, Mo.
Howard W. Peak, Fort Worth, Texas.
Richards & Conover Hardware Co., Kansas City, Mo.
Tolerton & Stetson Co., Sioux City, Iowa,
Rector & Wilhelmy Co., Omaha, Neb.

LLEWELLYN BONHAM, our New York representative,
Room 52 Pierce Building, N. W. corner Hudson and Franklin Streets.

We want a jobber in every distributing point in the United States, and a dealer in every town and city.
Write for catalogue, terms and discounts, and secure the agency.

Gurney Refrigerator Co., Fond du Lac, Wis.



FROM DEALERS LOOKING FOR THE

Best Refrigerator Made

We solicit an opportunity of presenting the merits of our

"Wisconsin Peerless."

Mineral Wool Filling. Absolutely cleansable. More and better talking points than all other makes combined. Absolute guarantee. Seventh season.

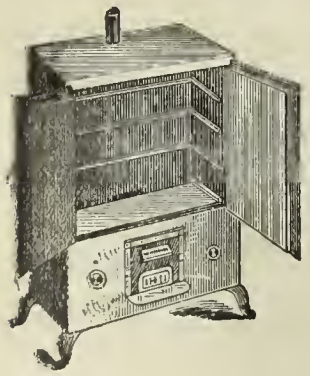
For Catalogue address

The Wisconsin Refrigerator Co.

EAU CLAIRE, WIS.
New England Office,
175 Hanover Street, BOSTON, MASS.

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



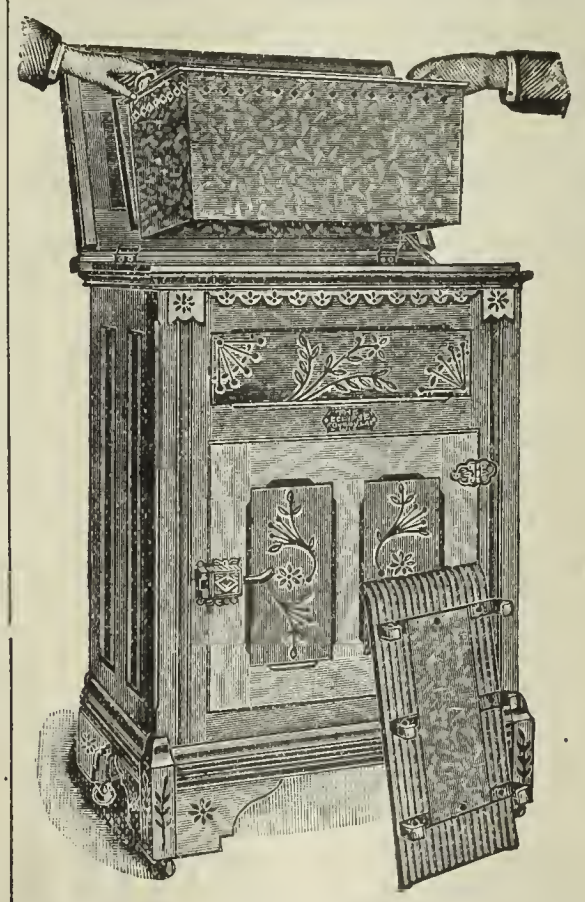
Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.
Burlington, Vt.



THE ECLIPSE HARDWOOD REFRIGERATORS.

Patented Separable and Removable Ice Compartment.

Can be kept perfectly clean with the least trouble.

It will pay you to write for Catalogue and secure the agency.

—THE—

Bowen Manufacturing Co.,

FOND DU LAC, WIS.,
SOLE MFRS.

NEW HAMPSHIRE

MICA

IS THE BEST.

The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.

MICA

MICA OF ALL GRADES

—FOR—

Stoves, Electrical and Mechanical Purposes.

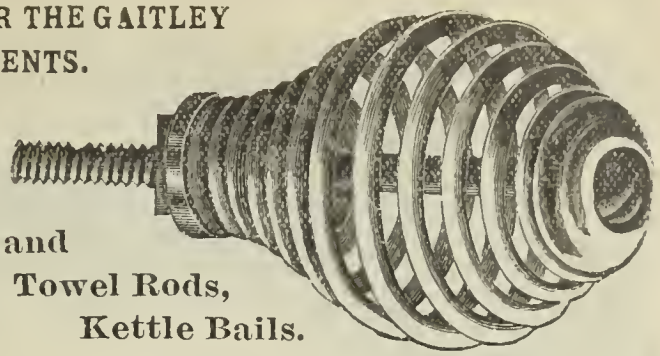
PALERMO MICA CO.,

Miners and Importers and Wholesale Dealers,

S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.



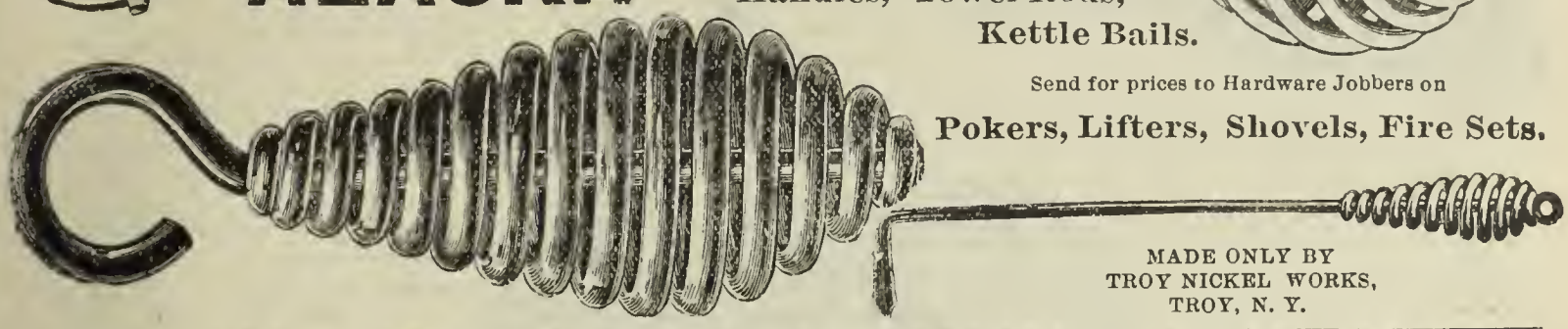
MADE UNDER THE GAITLEY PATENTS.



ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.

Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.



MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

Perforated Filter Press Plates.

THE HARRINGTON & KING PERFORATING CO. CHICAGO.



BRONZE SCREEN PLATES To withstand action of ACIDULATED WATERS.

METALS OF ALL KINDS PUNCHED TO ANY SIZE AND THICKNESS REQUIRED

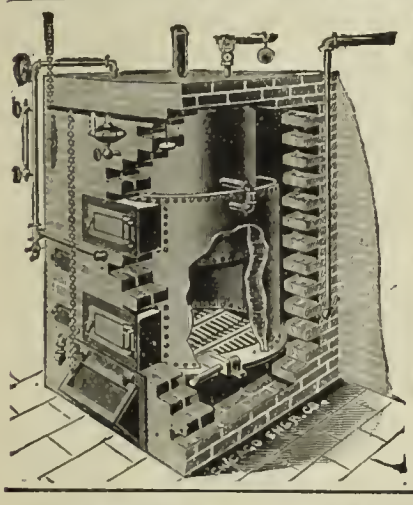
For Coal, Coke, and Ore Separators, Fixed and Movable Screens, Jigs, Trommels, Washers, and Sizers of all kinds.

For Grain Cleaning Machinery, Gas and Water Works, Oil, Flour and Rice Mills, Sugar Houses, Distilleries and Fertilizing Works.

Heavy Steel and Iron Plates and Cylinders for Coal and Coke, Breakers, Ore, Stone, Phosphates & Gravel Screens

Perforated Tin and Brass of all sizes for Oil, Gas and Vapor Stoves, Lamps, Lanterns, Ventilators, Filters, &c.

THE HARRINGTON & KING PERF. CO., Main Office and Works, 224 to 240 N. Union St., Eastern Office, No. 284 Pearl St., New York. **Chicago, Ill., U.S.A.**



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use **HARD or SOFT COAL.**

BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

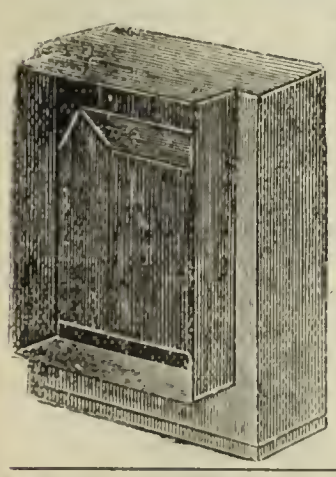
Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Propr.,
89 Fulton St., N. Y.



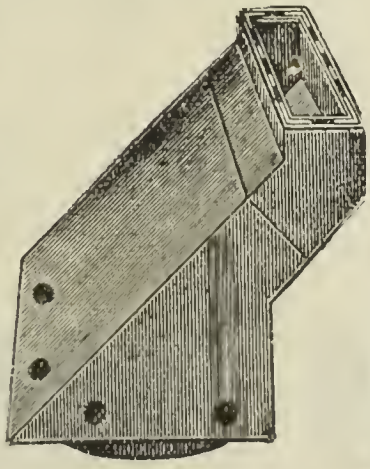
Novelty Ventilated Wall Pipe,

Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER.
18 Wood Street, Pittsburgh, Pa.





MICA

NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

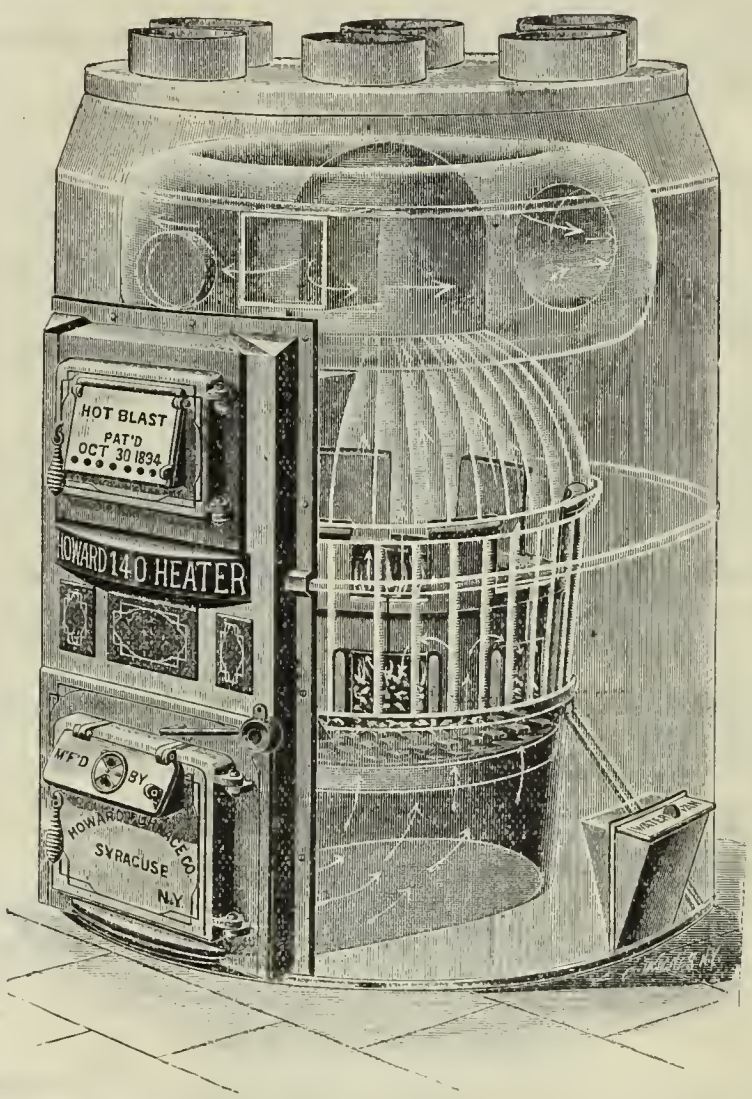
— ADVERTISING AGENT: "Look here, Exstein, I want you to advertise with us."

Exstein: "No, mein frient; the people what read the papers don't trade mit me."—*N. Y. Recorder.*

— "SEE HERE," exclaimed the red-headed woman in wrath, "if you ain't out of this yard in ten minutes I declare I'll run this umbrella down your throat and open it." "There ain't a bit o' use of that, mum," responded Dismal Dawson; anybody that's as dry inside as I am ain't needin' no umbrella in him."—*Chicago Tribune.*

HOWARD FURNACES

Made to BURN **Soft Coal.**



Made to BURN **Soft Coal.**

DO'NT YOU SEE

THINK THAT ANY ARTICLE HAVING MERIT IS WORTHY OF SOME NOTICE? WHY NOT THEN SEND FOR OUR CATALOGUE AND MAKE APPLICATION FOR AGENCY?

THE SIMPLICITY OF CONSTRUCTION. THE MANNER IN WHICH THE BLAST IS ARRANGED AND THE EASE OF ADJUSTMENT.

HOWARD FURNACE CO.

Main Office and Works,

Syracuse, N. Y.

NEW YORK, BOSTON, GRAND RAPIDS, TORONTO.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 12, 1895.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO. ....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS .....Bank of Commerce Building.
CLEVELAND .....812 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII ....No. 2.
Index to Reading Matter.....Page 52.

The Passing of the Depression.

The New Year starts out with many evidences of improvement as compared with 1894. The most important of these is the increased employment now being given to workingmen. A year ago "the army of the unemployed" was a significant phrase, as every community had its contingent of idle men, who were so numerous and so necessitous that their existence was a menace to the public peace. Thrifty and industrious men, who had scarcely known a day of enforced idleness, found themselves utterly unable to secure work at any rate of wages and were compelled to subsist on charity. The public soup house was for the time a national institution. But since then a very great change has occnrred. Disheartened bnsiness men and discouraged manufacturers have made a fresh attempt to do something and have gradually brought about a much more active condition of general trade. Thus idle workingmen have again been furnished with employment, and few localities can now be found with any considerable number of unemployed, except from choice. Charitable organizations are continued, as they are needed in even the most prosperous times, but the class of people dependent on them is wholly unlike that of last winter.

Employment of Labor.

The distinct gain that has been made in this respect, which is of prime importance to the welfare of the nation, is apt to be overlooked in the dissatisfaction felt at the unprofitableness of business. But it shows that a very great stride has been taken in the direction of a complete recovery from the depression. The masses of the people must be employed to insure consumption of goods, and all sorts of products must be freely consumed to keep the wheels of commerce moving. The inflnences which dominate business are now moving in the right way, and will necessarily continue to gather strength as they so move. The employment of additional men in one branch of industry enables more to be employed in other branches. That this movement is proceeding very satisfactorily is shown conspicuously in some instances which are, of course, exceptional. One of these, which happens to be in mind at the instant, is that of a large manufacturing concern, perhaps the most extensive in the country in its line, which had jnst completed an important addition to its plant when the panic of 1893 set in. The works were run with a light force for the remainder of the year and for the greater part of 1894, the new part being wholly unused from its completion. At the present time the entire establishment is running, including the new part, and the force of workmen employed is greater than ever before.

The Brightening Future.

No stronger evidence could be presented to prove that business is adjusting itself to the new conditions brought about by the great fall in values of the past few years, and particularly of the last eighteen months. It can safely be assumed that in the great majority of establishments now in operation methods have been or will be instituted whereby at least reasonable profits will be assured. The first great step is at least the partial restoration of the purchasing power of the people, and that can only be brought about by their full employment. A significant fact in this connection is the expansion in the production of pig iron, which is now proceeding at a rate approximating 9,000,000 tons per annum, or but little below the maximum output thus far attained. This being the basis of the iron industry, which is accepted universally as the barometer of general trade, the era of depression may be regarded as on the wane.

Politeness.

Politeness would appear to be one of the graces frequently considered unnecessary in the management of the shop. How often does the spirit of true politeness enter into the dealings of many foremen with their men whose work they direct? And because of the lack of it, how seldom do they receive from these men either the sympathetic or respectful obedience that is necessary to the most efficient management. Politeness should certainly not be confounded with familiarity or effeminatness, for it may go hand in hand with dignity of bearing and the most rigid enforcement of just orders. Its exemplification will always secure the respect of those who come under its influence, and it cannot fail to raise the moral tone of the shop and to create harmony between employer and employed. Because the man in authority has the legal (but by no means the moral) right to speak impolitely and even abusively to his workmen, who in turn are ordinarily expected to hold their peace, there certainly rests uponthe ruler the responsibility for any such condition as may result from ill-chosen words addressed to a workman. The golden rule is the rule of true politeness, and one may well hesitate if he thinks how his intended remark would sound if addressed to himself. How often the feelings of a conscientious workman are deeply hurt and his ambition chilled by the cutting, fault finding remark of his superior. A man with a conscience feels badly enough when he makes a mistake without being rudely treated because of it. It takes but a word politely spoken by his foreman to make him appreciate far more deeply his error than he would if he were angered by unjust criticism. A man has no excuse for impoliteness. He can acquire a manner that shall be more than merely just—a manner that shall express his desire to treat others as he would have them treat him, and he may rest assured that this acquisition will certainly raise him in the estimation of all with whom he is concerned.

Ventilation.

There are many readers who will peruse with interest the contribution by George D. Hoffman of Chicago, Ill., printed in another column, which deals with the all important subject of ventilation, a subject that is given too little attention in practice. In this country particularly, the healthfulness of fresh air is not snfficiently emphasized, but the recognition of its importance is happily growing, and all information relating to the methods of ventilating and the problems connected with it is sought by an increasing number. In Mr. Hoffman's article practical rules are given for figuring the velocity of air in ventilating flues, and those who do not care to work out the problem for themselves will be assisted by the table presented. What is said about the friction of air in passing through flues and openings is worthy of attention, as it is a matter too frequently disregarded. Altogether the article will well repay the attention of those who really care for fnndamental information.

Elsewhere we print the substance of an invitation issued by a number of progressive manufacturers of Cincinnati to attend a meeting in that city

on the 22d of this month, for the purpose of forming a national association of manufacturers. Such an organization, if well conducted, must prove a splendid engine for the advancement of our producing interests. We need the efforts of an influential body to effect reforms and aid in the pioneer work of establishing American goods in the markets of the world.

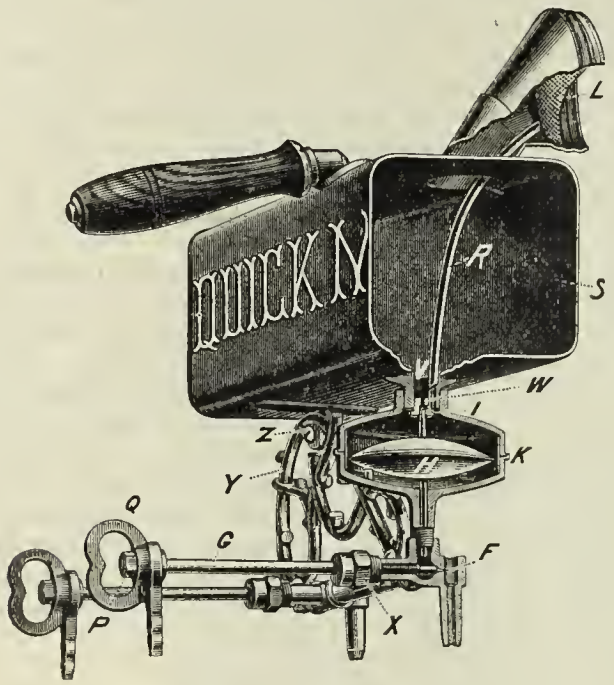
Test of Fire Proof Material.

An interesting test of a recently discovered process for rendering wood work and textile fabrics practically fire proof was given in New York City on Saturday, January 5, before a number of officials of the Fire Department, the New York Board of Underwriters and several representatives of important rail road and steamship companies and other large interests. On a large vacant lot at Fifty-eighth street and Broadway a small frame house was put up which was used for the experiment. The house was filled with pine shavings and kerosene oil, and the greater part of the wood in the structure was covered with the preparation patented by the Electric Fireproofing Company of New York City, who control the new process. Curtains which were hung at the windows had also been treated with the preparation. A fire was started in the building, which burned fiercely for an hour Only those parts which had purposely been left unprotected by the fire proofing preparation were apparently affected so far as combustion is concerned. The curtains also hung in their places until the whole structure collapsed from disintegration. The experts present are reported to have expressed the opinion that this was one of the most severe and successful tests that had ever been given to any fire proofing process.

"Tectorium" is the name of a substitute for window glass which has for some time been used in Austria, Italy, Germany, Switzerland and Russia as a covering for hothouses, verandas, windows of factories, roofs of stores, &c. It is described as an insoluble bichromated gelatine, translucent as opal glass, and incorporated in wire gauze.

The Quick Meal Tank for 1895.

The Quick Meal Stove Company of St. Louis, Mo., have been seeking for several years to produce a tank with a detachable and cleansible float for use in connection with their vapor stoves, but it was not until recently that they succeeded in accomplishing the objects sought. The new tank which they are offering the trade possesses features of novelty which cannot fail to prove of interest to all handling stoves using gasoline as a fuel. The makers state that the construction is such that the tank will not vary one drop a minute, whether it be full or nearly empty. Reference is made to the ease with which it can be dismantled and all the parts cleaned. Referring to the accompanying illustration, which represents a section through the tank, H is the float and K its housing, both of which can be easily removed by taking out the bolts Z and unscrewing the joints. After this has been done the plug W can be removed, leaving an opening, V, into the main tank, which is said to be sufficiently large to freely permit the escape from the tank of any sediment it may contain. The parts can be replaced without trouble, there being no packing employed and all the joints are metallic. The heads on the tanks are not only soldered, but are double seamed on a special machine made for the purpose. The drip valves are provided with stuffing boxes, which the makers state will prevent leakage in case the valves become worn from long use.



Quick Meal Tank for 1895.

The industrial classes of Rochdale, England, are about to celebrate the jubilee of the co-operation movement inaugurated in that busy and thrifty town. This celebration, says the *Labor Tribune*, is to be of a practical and sensible nature, as behooves so eminently sensible a movement. This movement, begun without pretension or parade, for 50 years has dispensed with fuss and feathers, and proposes to make the capstone of its jubilee a donation of $5000 to the Rochdale Infirmary. The organization was formed in December, 1844, with 28 members, and a capital of $140. The stock for their modest store in Toad lane was carried in a wheelbarrow. From this parent root no less than 1700 co-operative societies have come into existence, with 1,300,000 members, an aggregate capital of $90,000,000, the annual turnover being about $250,000,000, and the profits about $25,000,000 a year.

A National Convention of Manufacturers.

W. A. Procter, president of the Proctor & Gamble Company; Thomas P. Egan, president of the J. A. Fay & Egan Company; Edward C. Hall, president of the Herring-Hall-Marvin Company; Charles Davis, president of the Lodge & Davis Machine Tool Company; Robert Laidlaw, president of the Laidlaw Dunn-Gordon Company; Jas. E. Mooney, president of the American Oakheather Company, and H. M Lane, president of the Lane & Bodley Company, constituting a committee of the manufacturers of Cincinnati and Hamilton County, have issued a call for a convention of manufacturers to be held in Cincinnati on January 22, 1895, for the purpose of general interchange of views looking to the formation of a National Association of Manufacturers, which shall embrace among its purposes:

1. The cementing of a national organization of the manufacturers of the United States, for the purpose of considering national questions affecting their interests.
2. The advocacy of carefully considered legislation, to encourage manufacturing industries of all classes throughout the country.
3. The discussion of ways and means, whereby trade relations between the United States and foreign countries may be developed and extended.
4. The establishment in South American capitals and other desirable points of expositions for the display of American products.
5. The extension of the commercial marine of the United States.
6. The recognition of the Nicaragua Canal and the control of the same by the United States Government.
7. The re-establishment of reciprocal trade relations with foreign countries.
8. Such other topics as may be agreed upon by the convention.

It is desired that this convention shall be non-political, non-partisan and non-sectional.

The invitation is without limit as to number of attendants, and is extended not only to accredited delegates from organized exchanges, representing manufacturing interests, but to any individual manufacturer who may have the promotion of the general good by organized effort at heart.

The following programme has been outlined:

Tuesday, January 22, 1895, 11.30 a.m., preliminary meeting at Odd Fellows' Temple; temporary organization, appointment of committees.

Wednesday, January 23, 1895, 10.30 a.m., meeting at Odd Fellows' Temple; hearing and discussion of reports of committees. Two p.m , reception and lunch at the Queen City Club; evening, 8 p.m., concert and entertainment by the Symphony Club of the Chamber of Commerce.

Thursday, January 24, 1895, 10.30 a.m., meeting at Odd Fellows' Temple; permanent organization, selection of headquarters, election of officers. Evening, citizens' reception and banquet to visiting delegates.

The secretary of the Committee of Arrangements is E. P. Wilson, Room A, Chamber of Commerce, Cincinnati, Ohio.

PLUMBING and GAS FITTING.

Master Plumbers of New York.

Owing to the regular meeting night of the Master Plumbers' Association of New York falling on a holiday, it was postponed until January 8, when a special meeting was called. At this meeting the annual election was held, and the following officers were selected for the ensuing year :

President, Henry G. Gabay, 892 Third avenue.

Vice-President, Henry J. Pattison, 258 West Eighteenth street.

Corresponding and Recording Secretary, Charles A. Schloesser, 359 East Sixty-eighth street.

Financial Secretary, I. J. Brown, 166 East Eighty-second street.

Treasurer, John Yule, 68 West Ninety-fifth street.

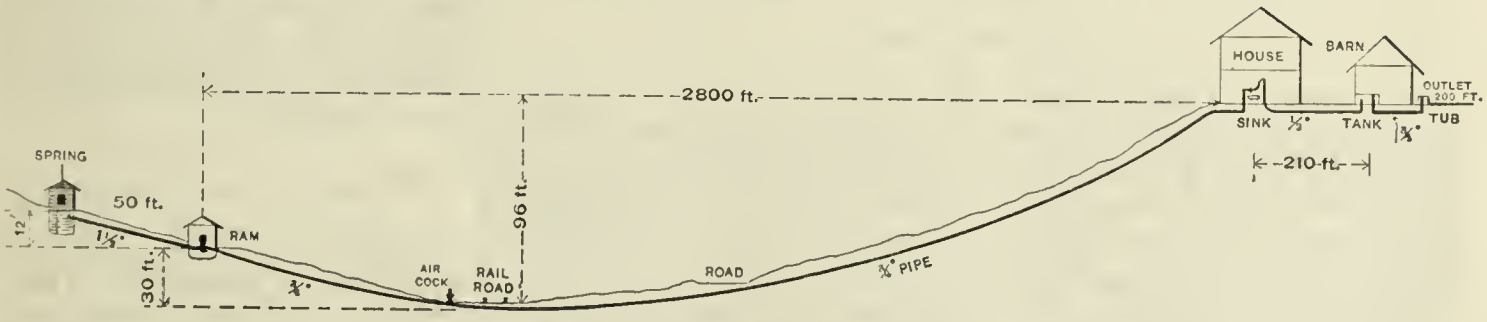
Marshall, J. G. Collins, 358 East 116th street.

Sergeant-at-Arms, Chas. J. Walsh, 10 Forsyth street.

Board of Trustees: James Gillroy (Chairman), 592 Park avenue; Wm. Montgomery, 258 West Eighteenth street; John Mitchell, 113 Hudson street ; Alexander Bryant, 12 East Twenty third street, and T. J. Tuomey, 1248 Third avenue.

A Suburban Water Supply.

The system of water supply shown in the accompanying illustration was put in operation by A. S. Brown of Norfolk, Conn., for one of his customers, the work being under the supervision of W. E. Case. The system has now been in operation for some time and is said to work perfectly. The water supply is taken from a spring which is located nearly 3000 feet from the house. The spring has been walled up so that it is 7 x 9 feet inside measurement, and has a depth of water of 6½ feet. A No. 4 W. & B. Douglas ram is located 50 feet from the spring, at a point having about 12 feet fall. A 1¼-inch supply pipe is run from the spring to the ram. A ¾-inch pipe runs from the ram to the house, having a fall of 30 feet to a point where it begins to rise, and making a rise of 96½ feet from this point to the house. A cock is placed at the low point so that the system may be drained. After entering the house the ¾-inch pipe rises to a faucet placed over the sink. After leaving the faucet the pipe is reduced to ½ inch in size and rises 3 feet above the sink, when it makes a downward turn and runs to a tank in the barn. This tank is arranged with a ¾ inch pipe as an overflow to a tub 33 feet distant in the barnyard. An overflow from the tub in the yard runs 200 feet and wastes. As the water is running through the pipe all the time there is very little danger of freezing; however, to prevent such a possibility the pipe from the spring to the ram is 4½ feet below the surface of the ground and from the ram to the house is 3½ feet below the surface. It is not wrapped or in any other way protected from the frost.



A Suburban Water Supply.

Lead Burning Class.

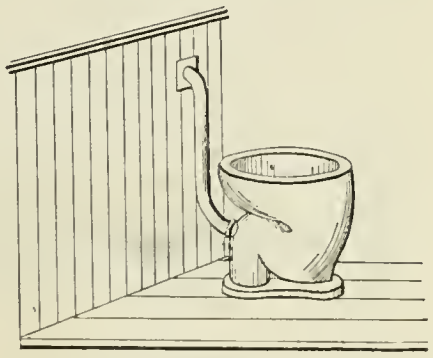
The day class in plumbing at the New York Trade School has been in operation one month under the superintendence of John Delehanty with the assistance of John McMenamy, Rutherford Clark, T. B. Walmsley, J. Wood and Thomas Kelly, and the boys are making rapid progress in the work. On next Tuesday the class in lead burning opens under the superintendence of T. B. Walmsley. Owing to the superior proficiency gained by the class last year under the instruction of Mr. Walmsley, the class this year opens with a surprising number of applications, 52 scholars having placed their names on the list, and others are unable to secure this course, not having filed their applications in time. That all these young men would not have frequent occasion to use lead burning as applied in the past is more than probable, but as a part of Mr. Walmsley's instruction he shows them how a plumber can use lead burning with advantage almost daily. The simplicity of his methods and apparatus have made many good lead burners much to the surprise of those who have been acquainted with lead burning as it is generally practiced.

In the past there has been some effort to create and maintain the idea that lead burning was a mysterious art, which only those who were especially gifted could acquire. To discover that there is a delusion needs only a visit to the school when the class are at work.

THE BEATON & BRADLEY COMPANY, Southington, Conn., are running their shop, making ceiling plates for the pipes run by plumbers and heating men in their work.

An Unventilated Vent.

From PLUMBER, *Chicago, Ill.*—According to the rules and regulations of the Department of Health, "all traps must be protected from siphonage by special vent pipes." The vent pipe is to connect with the increaser just below the roof, and is a very proper provision. Under some circumstances it is very inconvenient, or expensive, for the plumber to place a vent pipe so it will



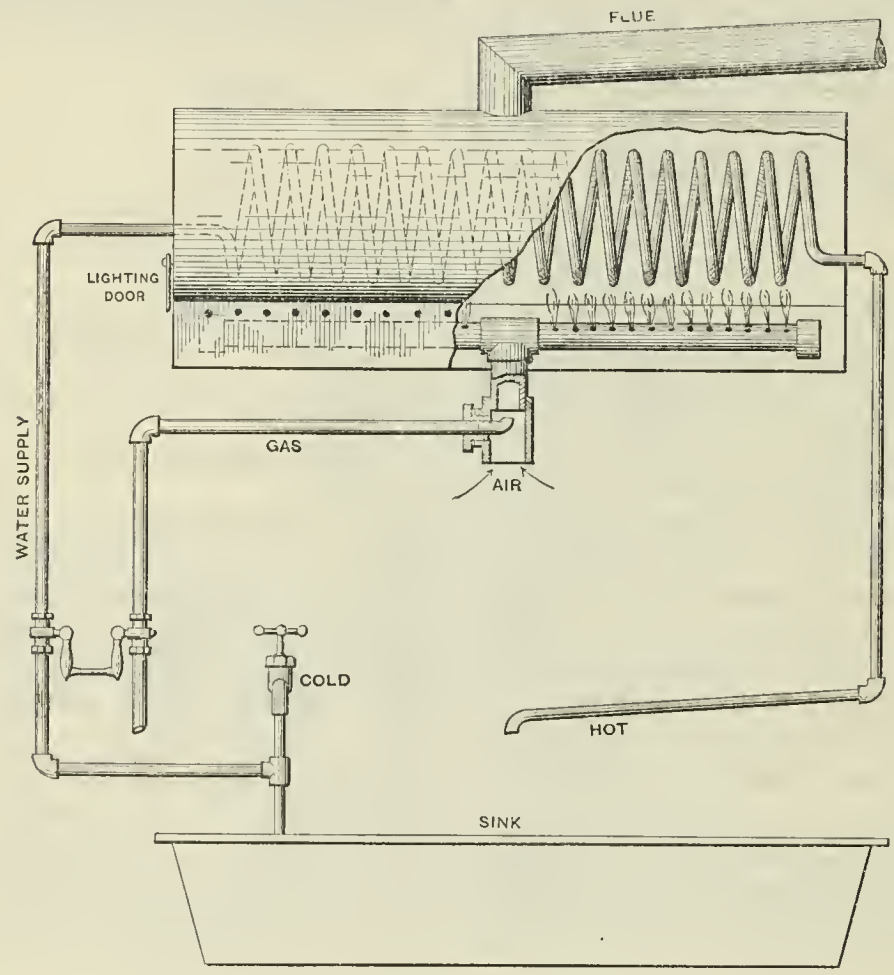
An Unventilated Vent.

connect the water closet with the increaser. A case of this kind recently came to the knowledge of an inspector, and certainly shows the importance attached to the inspection of plumbing work. As shown in the accompanying sketch, the vent pipe started from the water closet in an orderly and proper manner. It continued to the wainscoted partition, at which point a square piece of sheet lead was tacked and a wiped joint made connecting the lead and pipe. It was supposed, of course, that the vent pipe extended into the partition and thence through the roof. For some reason the piece of sheet lead had sprung away from the wainscoting so a knife blade could be inserted between, and what was the inspector's surprise when he discovered there was no pipe, as the vent was only "bumped" against the sheet lead and a joint made, leading one to suppose that the vent extended upward to the outer air. The boss was greatly surprised when this condition of affairs was made known to him and disclaimed all knowledge of the affair. As a result it is presumed the journeyman plumber who did the work in such an improper manner received all of the blame. It is perhaps unnecessary to state that the vent pipe was extended

to the pure air that is supposed to surround Chicago dwellings and that the plumber was put to considerable expense and trouble in making the change.

A Gas Water Heater.

From L. M. W., *Delaware* —Some of your readers may be interested in the water heater which we are using in our shop. Being located near a junk dealer I noticed a copper coil about 6 inches in diameter and 20 inches long lying on a pile of iron all one summer and coveted it, though I had no use for it. When the winter set in we found washing our hands in cold water rather chilly, but with the chill came the junk dealer for a man to fix his stove grate. I told him I would do it myself if he would give me that old coil, to which he agreed. I heated the coil and bent it so that the ends pointed at a right angles to it, as shown in the picture. I then made a jacket of No. 24 galvanized iron 8 inches in diameter and 21 inches long, and cut a slot in it 2 inches wide and 19 inches long, and riveted to the slot an open top chamber 2 inches wide and 2 inches deep. Next I made a burner out of two pieces of 1-inch pipe, drilling ⅛-inch holes in them along on both sides ¼ inch apart and about one-quarter of the diameter apart the other way. The pieces of pipe were about 7 inches long with a cap on the end, and they screw into a T and set in the burner chamber. I fixed a baffle plate in the jacket, set the burner in place, and then fastened the coil in the jacket, after which I put a head in each end. One head has a hole in it for lighting the burner, and I punched a row of ⅛-inch holes along the slot 1 inch apart to give air to the burner. A 2-inch pipe with a damper in it leads from the jacket to the chimney. Straps riveted to the jacket hold the coil and burner in place. Into the T in the burner I put a nipple, then another T, open at the bottom to admit air, the gas entering the side of the T through a small tube that pointed up a little. I fastened the heater against the wall of the shop over the sink, and took a branch out of the cold water pipe just below the faucet, and ran it to the coil, putting a stop cock on it, and ran a pipe from the other end of the coil to a convenient place over the sink. I piped the gas supply to the burner with a stop cock on it near enough to the water cock to connect the levers. In operating either cock, both are opened or both are closed, and the gas flame is extinguished when the hot water is shut off. By this arrangement no faucet is needed on the hot water supply at the sink. Before this apparatus was constructed we had no means of getting hot water in the shop, which was heated by a hot air furnace, and there was too much difficulty and expense in putting in a pipe coil attached to a boiler. One day the boss had been out with me and we both got our hands as dirty as moist soot could make them, and in the office he expressed a wish for hot water for washing up. As he knew nothing of my water heater I surprised him by saying I could furnish him with all the hot water he wanted in a minute at the shop sink. I invited him to the shop and opened the lighting door in the heater and struck a match, opened the stop cocks, lit the burner and in less than a minute he had water in abundance as hot as he wanted it. He gave me an order to make one for the office, which I placed under the basin and fitted it with a small pilot light. They both do good work, did not cost very much and use very little gas.



A Gas Water Heater.

THE WELLS NEWTON-QUAY COMPANY, Chicago, have moved their office from the first floor to Rooms 237–238 Monadnock Block.

Maelstrom Siphon Closet.

The Maelstrom is the name of a new siphon closet which Owen & Salter, Buttonwood and Twelfth streets, Philadelphia, are putting on the market. The accompanying cut shows the closet complete with seat and cover. The action of the closet is claimed to be strong and rapid and absolutely noiseless. These features are due to the arrangement of the water supply, which is divided at its entrance by means of arms on each side of the closet and carried to the flushing point, where the streams are again united. Another feature is the mode of securing the seat. As will be seen the fastening is effected by a clamp of pleasing design, which fits in a groove around the supply arm. This does away with the ordinary screw fastening, and insures a strong and perfect attachment which cannot become loose. The closet is claimed to work perfectly under any pressure, and, by reason of its manner of operation, to be free from odor. It is made of vitrified china, which will not craze, and in its construction the makers have aimed to secure durability.



Maelstrom Siphon Closet.

Patronize the Plumber.

A commercial traveler writes in a local paper: I would like to call your attention to the statement that it is of "almost monthly occurrence that some 'Reuben' from the country blows out the gas while retiring for the night at the hotel where he may be stopping." I have been on the road for nearly 20 years and have found that a great many of the gas fixtures in the hotel rooms are sadly out of repair. It is quite often the case that when the stop or key is turned to shut off the gas it does not stop where it should, but turns around too far, thereby putting out the light, and at the same time letting on the gas again. I have found a great many fixtures out of fix as described above. It has often occurred to me that possibly some of the deaths charged to the verdancy of the lodger might well be laid to the carelessness of the landlord.

Philadelphia Master Plumbers' Association.

The annual meeting of the Philadelphia Master Plumbers' Association was held at the Builders' Exchange, Philadelphia, on Thursday evening last. After routine business was disposed of the election of officers for the ensuing year took place, the following being elected:

President, John E. Eyanson; vice-presidents, Geo. F. Uber, Frank P. Brown, John Gormly, Wm. McCoach and G. Wallace Smith; recording and corresponding seecretary, William S. Clark; treasurer, William Harkness, Jr.; directors, William S. Clark, Chas. L. Parmalee, Wm. Harkness, Jr., A. M. Hicks, R. Drummond, J. Sellers Pennock and John E. Eyanson, *ex officio;* sergeant at-arms, Samuel B. Fleming.

The committee on the National Convention reported favorable progress of arrangements.

Some little discussion took place in regard to the proposed city ordinance regarding the opening of streets, under which the charges for permits varied according to the kind of pavement opened. There had been a meeting that day of the sub committee of Councils' Committee on Highways appointed to consider the matter. Mr. Harkness, as the representative of the master plumbers, reported the result of his attendance before the committee. The president of the Operative Builders' Association had also attended the meeting and had stated that his association desired to have a fixed price for repaving ditches. Mr. Harkness indorsed the opinion of the operative builders. The city, he said, should take charge and there should be a fixed price for each opening. He had urged that a postponement of action be allowed in order that the matter might be discussed intelligently by the master plumbers. It had finally been arranged that a meeting between the plumbers and operative builders should be held on the 17th inst., and their representa tives appear again before the sub-committee of councils on the following day, when some definite course of action would be agreed upon. A committee was accordingly appointed to attend the meeting next Thursday.

Mr. Harkness informed the meeting that an exhibit of the plumbing work executed by the boys in the Trade School of the Builders' Exchange would be placed in the permanent exhibition attached to the exchange.

The Plumbing class in the Trade School is filled to the overflowing point, and the showing so far is very satisfactory.

TRAPS AND VENTS.

Mayor Schieren of Brooklyn, N. Y., has appointed P. H. Gleason of 185 Fort Greene place on the Examining Board of P umbers. The compensation is $5 a meeting, for four meetings a month.

The Day, Ward Company have moved into their new building on North Park avenue, Warren, Ohio. It is a substantial two story and basement structure of hollow tile blocks, and is a model establishment, heated throughout with hot water. Power is furnished by a 12 horse-power gasoline engine, and it will be lighted by an independent electric service.

Pritchard & Co., plumbers, have removed from Exchange street to Pickering square, Bangor, Maine.

The Swain Bathtub Works, 1707 Carpenter street, Philadelphia, have a capacity for turning out from 60 to 80 bathtubs per day and report that their business in copper, zinc and galvanized iron lined baths is on the increase.

E. Comport & Co., 921 Filbert street, Philadelphia, carry an extensive line of fine sanitary goods, in baths, closets and lavatories, in addition to their line of plumbers' brass goods and steam fitters' supplies.

Dr Z. Taylor Emery, health commissioner of Brooklyn, N. Y., has appointed Wm. Paul Gerhard, C.E., to the position of honorary consulting sanitary engineer to the Department of Health of the City of Brooklyn.

Erion & Dome are a new plumbing firm at York, Pa.

The advisability of having a plumbing inspector is being discussed at Charlottesville, Va., where a new system of sewers is to be opened.

The new licenses to plumbers and drain layers in Milwaukee, Wis., were issued last week by the Board of Public Works. There are 103 plumbers' licenses and 131 drain layers' licenses. Both plumbers and contractors lay drains.

S. Davis n, 56 Beekman street, New York, is issuing a 16-page catalogue of Weeden's hotel and public building sanitary specialties. The first pages of the book are devoted to a waste preventing urinal, the use of which starts the flush. Three illustrations are shown of it. Next, a slop hopper, working on the same principle, is shown. A scientific safety basin occupies the next pages, a sectional view showing how the water is siphoned out of the basin before it can overflow. The last specialty is a chair closet adapted for use in apartments where the appearance of an ordinary closet would be objectionable.

Carl Jenner, formerly with J. B. Farnsworth, Leominster, Mass., will open a plumbing establishment on his own account.

On January 10 the Master Plumbers' Association of Brooklyn, N. Y., installed the officers elected to serve during 1895. They are: President, E. A. Macdonald; vice-president, H. L. Potter; recording secretary, H. M. Noble; financial secretery, John W. Kelly; treasurer, Geo. B. Lewis; marshal, J. J. Keenan; sergeant-at-arms, Joseph Zoll; trustees, Wm. C. O'Keefe, Thomas H. Radcliffe and Martin Fallon. Conference Committee, Wm. J. Gault, H. Anderson, Thomas H. Radcliffe, J. Manneschmidt, M. F. Gleason and Martin Fallon. The ceremonies were in private and at some later date a public entertainment will be given.

John P. Ganley has been appointed Plumbing Inspector and Wm. H. Hudson has been appointed a member of the Examining Board of Plumbers at Hudson, N. Y.

P. E. Cox, Fort Wayne, Ind , has established a branch of his plumbing business at Columbia City, Ind.

The plumber will find artic'es both for himself and his customer at Lalance & Grosjean Mfg. Company, 19 Cliff street, New York. They have an extensive line of ladles for pouring molten lead, those of smaller size for wiping joints on small pipe, increasing in size to large ladles for pouring lead in the joints on extra large soil pipe. They also have a large line of stamped steel sinks for bath, kitchen and pantry use, some being finished as polished steel and others finished in enamel in different colors.

The Folding Bathtub Company, Marshall, Mich., have increased the size of their plant by one-third, and added several new and improved machines for special work. The demand for their specialties was sufficient to keep their plant in full operation the whole of last year.

The plumbers of the different cities in Connecticut are co operating in an effort to have a law passed at the next session of the Legislature to properly regulate plumbing and drainage in the State. The law will provide for an examination of plumbers and an inspection of plumbing work.

E. M. Brown has withdrawn from the Clement & Brown Mfg. Company, Bangor, Maine, and in the future O. L. and F. G. Clement, under the same firm name at the old establishment, 133 Exchange street, will continue the business of manufacturing furnaces, stoves, &c., plumbing, steam fitting, tin and sheet iron work. The Mascot furnace has been a specialty of the concern.

On January 1 the firm of P. McAuliffe & Son hung their sign to the public, at Augusta., Ga. This is the well known house of P. McAuliffe, plumber and gas fitter, with the addition to the firm of Theo. G. McAuliffe, who has been admitted as a partner. The firm will continue in business at 838 Reynolds street.

The officers for 1895 of the Master Plumbers' Association of Paterson, N. J., are: President, James Kearney; vice-president, John Quinn; corresponding secretary, James T. McNab; financial secretary, William McKeon; treasurer, Edward Blair.

James S. Lindley has sold his plumbing business, stock and tools to E. J. Winslow & Co., at Brattleboro, Vt.

The Master Plumbers' Associa tion of Cincinnati, Ohio, held its an nual election at the Builders' Exchang last week. Nearly all of the members who number about 60, were present The election resulted as follows: Presi dent, E J. Nolan; vice president, Charles Atkinson; secretary, Frank Hopper; treasurer, James A. Gibson; sergeant-at-arms, Thomas Lynn.

Plumbing Inspector Wayson of Detroit, Mich., was very busy last week inspecting the plumbing in a number of new and large buildings in that city.

In the issue of the Boston *Herald* for Monday, January 7, were sketches of a number of firms of that city which had been in active business for 50 years or more. Among the number were the Dalton Ingersoll Company, manufacturers of fine sanitary appliances. We quote from the article as follows: "This house was established in 1845 by Dalton & Ingersoll, who conducted the business for years at 17 and 19 Union street, removing thence to their present commodious quarters of a five story building, 56 x 180 feet, at 169 to 175 High street, Fort Hill square. About two years ago the business was incorporated with a paid up capital of $125,000, under the present style, thus perpetuating the names of the founders. The officers are Emery F. Souther, president, Charles W. Morse, treasurer, and William Scott, manager. These gentlemen are all natives of Massachussetts and devote their personal attention to the management of the enterprise. No house is more fully equipped for the proper transaction of its business, none more progressive and alert."

STEAM AND HOT WATER.

Steam and Hot Water Heating at the New York Trade School.

The three months' day class of instruction in steam and hot water heating was opened at the New York Trade School on January 2. This class began with a greater number of applications than was ever secured on the first opening of any of the classes in the different trades taught at the school. The lectures will be given by Thomas E. McNeill of Thomas E. McNeill & Son, heating and consulting engineers, 125 West Thirty-fifth street, New York. The manual instruction will be given by Charles Coolidge. Mr. Coolidge is well qualified for the position, having spent ten years with the Nason Mfg. Company in their pipe fitting department, and for the last four years as superintendent of the installation of such work as had been contracted for by William J. Baldwin, the well-known engineer.

Although the class has only been started a few days, some idea of its value may be gained from the remark of one of the pupils. The young man has worked at plumbing and gas fitting for four years and said: "I have already learned quite a good many valuable things about measuring for pipes, laying out work and putting up the pipe, that would have saved me much trouble had I known them in the past." The class is composed of:

Albert J. Logan, Brooklyn, N. Y.
Alfred D. Conant, Plainfield, N. J.
Arthur R. Thorpe, New Haven, Conn.
Arthur S Ingersoll, Beverly, Mass.
Charles E. Scudder, Binghamton, N Y.
Gavin N. Houston, East Orange, N J.
George H. Brown, Chicago, Ill.
Herbert L. Moore, Cambridge, Mass.
J. Harvey Ward, East Orange, N. J.
Jacob J. Keller, New York City.
John A. Hempel, New York City.
Paul Mueller, Milwaukee, Wis.
Rudolph Ewald, Jersey City, N. J.
William H. Kroephe, New York City.

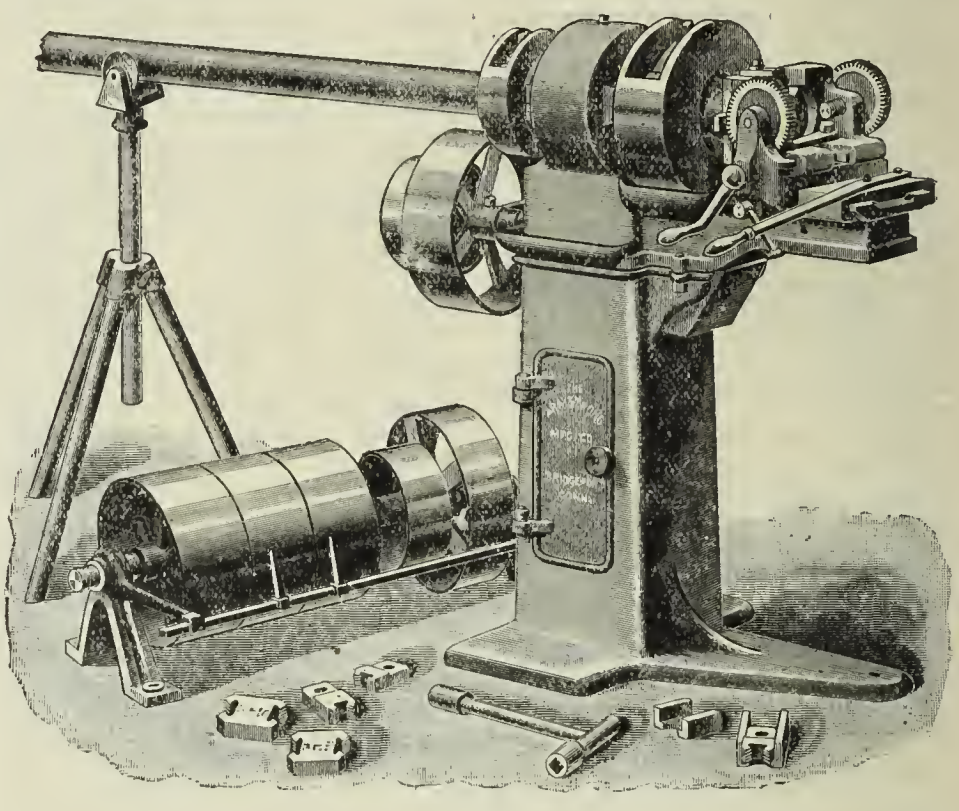
Armstrong Pipe Threading and Cutting Off Machine No. 2½.

The illustration presented herewith shows an improved form of the No. 2 pipe threading and cutting off machine for hand or power, built by the Armstrong Mfg. Company, Bridgeport, Conn., and retains the many attractive features of that machine in addition to others peculiarly its own. It is described as very compact, rigid and durable, and does not require the services of a skilled operator. All of the gears and working parts are inclosed in an oil tight chamber, which insures their perfect lubrication and effectually keeps out dust, dirt and chips.

Ease of operation and long life to the vital parts of the machine naturally follow, it is pointed out, as the result of this construction. A peculiar feature of the machine is that in its operation the pipe revolves instead of the dies, being held securely by tight gripping chucks.

For radiator steam coil works, &c., and other services where the greater number of pipes are comparatively short lengths, this is referred to as a particularly desirable arrangement. The dies and cutting off tool are held stationary, and are opened and closed by means of a double geared crank handle, as shown. Expanding dies are used in connection with a self centering and powerful gripping chuck, insuring speed in cutting off and threading a pipe. These are of the regular Armstrong pattern, and are furnished to thread from 1 inch to 4 inches inclusive. Quick interchangeability of the various sizes of dies, coupled with a construction which permits of separate adjustment for three different sizes, enables the operator to thread pipe to suit all variations in ordinary fittings, and to open and close the dies any number of times without changing the adjustment. Again, either of the sizes may be used alternately without change of adjustment, or the dies may be quickly taken out, to permit of the free passage of the pipe to be cut off, and the adjustment still remain unchanged.

An objection frequently raised against machines using expanding dies is that the men are not skillful enough to use expanding dies without threading some of the pipe too large and some of it too small. This has been met, and, it is claimed, successfully overcome in the tool here shown; for although the dies are quickly opened after threading a piece of pipe, yet they may be as quickly closed together again without the least danger of variation, unless intentional. The weight of this machine is about 700 pounds; with countershaft, 850 pounds. Speed of countershaft should be about 225 revolutions a minute. The Armstrong Mfg. Company report a wide adoption of the No. 2½ machine among water, gas and steam fitters generally. The headquarters of the company are located at Bridgeport, Conn., with New York offices and salesrooms at 139 Centre street.



Armstrong Pipe Threading and Cutting Off Machine No. 2½.

Circuit System of Hot Water Heating.

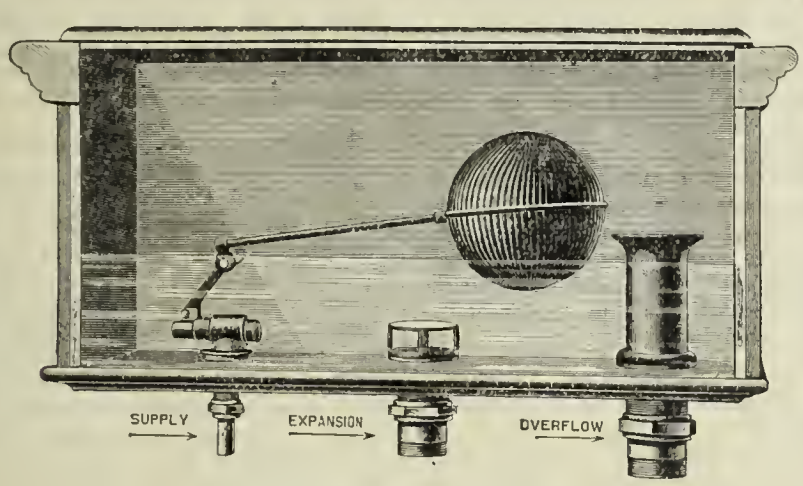
From S. B., *Dalton, Mass.*—We have read with interest the account of piping a combination hot air and hot water furnace given by the Howard Furnace Company in *The Metal Worker* of October 20. We wish to inquire if such a system could be used satisfactorily in piping a common hot water boiler? If such a system can be used, would it work as well as with separate flow and return mains?

Note.—We shall be glad to have any of our hot water heating friends who have had experience with the circuit system express their views in answer to this correspondent. In order that he may have some information as a guide, we would say that a number of house heating boilers have been piped on tha

circuit system with satisfactory results. It is probable that more skill, or rather a more thorough understanding of the science of heating, would be necessary in installing a satisfactorily working circuit system than would be required with a separate flow and return to each radiator. The article which appeared on October 20 calls attention to the fact that the radiators increase in size the further they are placed from the boiler, to offset the cooling of the water.

Automatic Expansion Tank.

We show in the accompanying illustration an automatic expansion tank brought out by the Ideal Boiler Company, 35 Dearborn street, Chicago, and 45 Oliver street, Boston. The tank is designed to be located in the bathroom or any other situation over the highest radiator and convenient to the water and plumbing system of the house. It is made of hard wood, dovetailed at the corners and lined with sheet copper, and can be supplied in any kind of wood to match the finish of the room. It is pointed out that the necessity for gauge glass and fittings, as well as the altitude gauge, is avoided. It is said



Automatic Expansion Tank.

to be absolutely automatic in its operation. The size illustrated is adapted to hot water work to which there is attached 2000 feet of radiation or less.

A Heating Problem.

From Hub *Boston, Mass.*—In reading *The Metal Worker* of December 29 I noted the letter from "T. F. C.," asking for a solution of the trouble which he describes and illustrates with a diagram. I think the trouble is caused by the return water from the 60 foot radiator throttling that from the two radiators of 100 feet of surface. As he does not state the distance from the boiler to these two radiators, I take it for granted that it does not exceed 35 lineal feet if they are on the first floor, or 50 feet if on the second. It may be well to state that by throttling I mean that the return water from the 60-foot radiator being very much hotter than that from the two radiators, and the pipe being pitched up toward the two radiators, the hot water has a tendency to move toward them instead of back to the boiler. If the cause is what it appears to be it can be remedied in several ways: 1. The safest and cheapest way is to bring a separate return back to the boiler from the 60-foot radiator and enter it at the base of heater or bottom of return. 2 Make the return from the 60 foot radiator enter the main through a Y fitting and from the side instead of the top of the main. 3. Do not have the pitch of main from the radiator connection exceed 1 inch in 10 feet. This will probably prevent throttling. 4. Take expansion pipe from end of main that does not circulate. If throttling is the trouble, some one of these remedies will cure it, if there is not a pocket in the main; if there is it must be taken out.

Why we Ventilate.

A paper, from which we quote below, read by Louis Wilde before the Society of Minnesota Florists, discusses pure air and ventilation as necessities in a manner that presents the arguments from a new and impressive standpoint.

In experimenting with our roses under glass, I think that we go at it entirely too one sided. We pay too much attention to what our plants must have to eat and drink, so to speak, and too little or none at all to what they must breathe. In other words, we care too little about the air our roses have to live and grow in. As long as it does not appear foul to our sense of smell, and is not considered bad from our personal point of view, we are apt to regard it as all right for the roses, forgetting that what is agreeable to us may not be to them, and *vice versa*.

I have been through quite a number of rose houses, and what I have seen and the opinions I have heard expressed regarding ventilation are astonishing. One meets so called rose growers who have not the faintest idea why rose houses should be ventilated, neither do they know or suspect what influence the air exerts on the growth of the plants. Many consider ventilation an easy means of regulating the temperature of the houses rather than anything else, and, with them, opening the ventilators in cold weather means a needless waste of coal. There are growers who keep their houses shut tightly for two or three months at a time during cold weather.

In my opinion there are two good strong reasons why we should ventilate:

1. To change the exhausted air of the houses for the purer one without, full of the elements necessary for plant life.

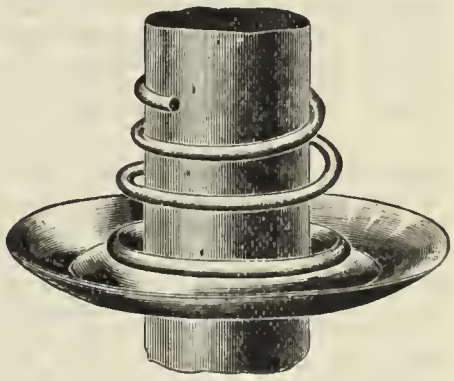
2. To regulate the moisture contained in the air in our houses.

We all know that one of the most important substances which build up the tissues of the plant is taken directly from the air through the pores of the leaves and under the influence of light. I am referring to carbon. The air contains relatively only a very limited quantity of this element and important plant food. In such a comparatively small space as our houses this will soon be used up. When carbon is not present in the air of our houses in sufficient quantity the plants will not grow vigorously. Its total absence means death to them. This, however, will rarely, if ever, occur, as no house can be built air tight, and on that account an exchange of air, however insufficient, will always take place. On the other hand, a small amount of carbon is also supplied by all decaying vegetable matter in the houses, such as sods and stable manures, so that even if a house be never ventilated the plants will not die at once, but as the supply of carbon is insufficient they will grow straggling and sickly. As plants are taking up carbon during daylight, we should have ventilation during that time, if at all possible.

We must further ventilate, as before stated, in order to regulate the atmospheric moisture of our houses. Moisture of the air influences indirectly the growing process of the plants in so far as its presence in smaller or larger quantity regulates the evaporation going on on the surface of the leaves, which evaporation in its turn gives rise to the flowing of the sap, thereby causing nutrition of the plants.

The Columbia Ceiling Plate.

The J. W. Chamberlain Company, Bangor, Me., have recently patented and are manufacturing the Columbia patent wall and ceiling plate, a view of which is shown in the annexed illustration. The device is so simply made that a brief description will suffice, and the advantages of its construction will be readily understood by referring to the engraving. The plate is designed to be used on all steam and hot water



Columbia Ceiling Plate.

pipe and is complete in itself, requiring neither screws, hooks nor other device to hold it in place. After it is put in position the spring is pulled taut and the work is completed. It will be understood that the expansion and contraction of the pipe will not affect the plate, which, it is said, cannot slip away from the ceiling, since it is held by the pressure of the spring, the spring giving with the expansion of the pipe and contracting as the latter contracts. The plate is made of stamped brass, nickel plated, and the spring of tempered steel, coppered. It is made in sizes ranging from ½, ¾, 1, 1¼, 1½ and 2 inches.

The steam and hot water heating trade will be interested in the new price lists of radiators just issued by the American Radiator Company, and which we print this week in the Trade Report. The regular and special lists are presented and reference made to a third list of the Favorite radiators, the entire output of which they handle.

HEATING NOTES.

THE IDEAL BOILER COMPANY of 36 Dearborn stree', Chicago, and 45 Oliver street, Boston, have sent out a quaint circular, which cannot fail to attract attention. It is a large maroon colored card, printed in silver, with a yellow circular of smaller size posted to one side of it. On the circular is the four-leaved clover of the company with the legend "A New Leaf for '95." On the inside pages of the circular are some very original remarks to buyers of boilers.

THE OLD STORE of the Cowles-Couch Company, Hartford, Ct., will hereafter be occupied by a new firm, Couch & Hartley, who will engage in the general plumbing and heating business. Mr. Hartley was formerly connected with the Howard Furnace Company.

THE STANDARD RADIATOR COMPANY'S general offices have been moved to their Chicago store, at 167–169 Lake street, and will be in charge of D. Paul Hughes, manager.

THE AMERICAN RADIATOR COMPANY of Chicago have arranged to open a branch office in London, England. Henry S. Downe, until recently one of the directors of the American Boiler Company of Chicago, will be in charge, having severed his connection with the latter company. Mr. Downe was born in Mason, N. H., and is 33 years old. Always accustomed to positions of responsibility, he was at one time superintendent of the Simonds Rolling Machine Company. He has been many years associated with the heating business in various capacities, and always with the leading companies engaged in the trade. He is a member of the American Society of Mechanical Engineers and is a graduate of the Worcester Polytechnic Institute. He was vice-president of the National Hot Water Heating Company when that company became a part of the American Boiler Company.

A NEW 20-ton cupola is in process of construction and nearly finished, at the United States Radiator Works, Dunkirk, N. Y. The cupola is the Whiting patent, very complete in all its workings, having a patent alarm when the metal rises, and other late equipments. It is 39 feet 6 inches high, with an incline hoist and scales. Another late improvement since the new foundry was built is the core drying ovens, in which 1750 cores can be dried at one baking. A bushel of coke dries 450 cores. These improvements were made under the supervision and from plans of Jesse A. Fields and Thomas M. Burman, the superintendent and foreman.

S. STEPHENS, secretary of the J. F. Pease Furnace Company, Syracuse, N. Y., was a visitor in New York City this week.

THE FOSTER ENGINEERING COMPANY of Newark, N. J., report a rapidly increasing demand for their new "Class W." steam pressure regulators. Among orders just booked for large valves they mention: One 10-inch, for the Lehigh Valley Railroad Company coal mines; three 8 inch, and one 5-inch, for the Watts-Campbell Company for use at the Newark Electric Light and Power station; one 6-inch, for the U Street Pumping Station, Washington, D. C; one 5-inch, for Dixon's Paper Mills, and two 6 inch and two 4-inch, for the new American liner "St Louis." These latter are in addition to 20 regulators from 8 inch to 4-inch, furnished for that ship in December.

A CATALOGUE AND PRICE LIST dated January, 1895, distributed by the Foster Engineering Company, Newark, N. J., is entitled "Facts Worth Knowing About Pressure Regulators and Pump Governors of Practical Value to All Steam Users." The publication is a neat pamphlet of some 40 pages, containing illustrations of the regulators, both general and sectional, together with full descriptions of the devices. Many different regulators are shown, together with some other steam specialties.

THE ADVERTISING MATTER distributed by Gaylord & Eitapence, Binghamton, N. Y., is both serviceable and attractive. A pamphlet entitled, "What Other People Have to Say About Gaylord & Eitapence's Imperial Boilers," is a publication of portfolio style, handsomely printed on fine paper, and shows cuts of the Imperial boiler, both brick set and of portable form; likewise, illustrations of the separate parts are given. The bulk of the work, however, is taken up with illustrations of buildings in various parts of the country heated by Imperial boilers, and in connection with the illustrations are given testimonial letters from the house owners. At the end of the pamphlet is a table of sizes and prices, capacities, &c. Another advertising specialty of more than ordinary serviceableness is a plaque of ivory tinted celluloid, carrying a neat engraving of the Imperial portable boiler ready for piping. At the side of the boiler is a thermometer, which is mounted on the sheet and marked with wide black lines that permit its easy reading. The red liquid in the tube is also plainer to the eye than the customary mercury thread. Altogether it is a most serviceable souvenir and will be much appreciated by those receiving it.

THE HERENDEEN MFG. COMPANY, whose Western office is at present at 131 Lake street, Chicago, with A. G. King as manager, are contemplating removal to larger quarters, where may be had a finer display of Furman steam and hot water boilers and heating supplies. The Chicago office of this company now handles the entire West outside of the coast and the State of Wisconsin, which is handled, as before, by E. A. Savage of Milwaukee.

THOMAS WEATHERED'S SONS are preparing to move their office to the Cornell building at 137–141 Centre street, New York, where they will display their line of hot water apparatus for heating residences and greenhouses.

T. J. DOUGLAS, representing the Richmond Stove Company, Norwich, Conn., passed through New York this week on the way West, where he will make an extended trip among the steam and hot water heating trade.

R D. JACKSON, 89 Centre street, New York, Eastern agent for the Van Auken Steam Specialty Company, Chicago, reports an increasing demand among the trade for the Van Auken air valve.

FRANKLIN & BURNHAM, the New York representatives of the J. F. Pease Furnace Company, Syracuse, N. Y., have moved their headquarters to the building at Beekman and Pearl streets. Here they have a well lighted showroom in which they will display the Economy line of furnaces, steam and hot water apparatus and combination heaters.

JAMES W. BIRKETT MFG. COMPANY have opened an office at 105 Beekman street, New York, where they are prepared to take orders for steam and hot water fitters' supplies.

THE EXECUTIVE COMMITTEE of the Master Steam and Hot Water Fitters' Association of the United States will meet at their headquarters in the Cable Building, New York, for the transaction of regular business at the same time that the American Society of Heating and Ventilating Engineers are in session during the fourth week in January.

AN EIGHT-SECTION 20-inch Niagara radiator connected with a small gas water heater is used as an auxiliary heater in the New York office, at 89 Centre street, of the Niagara Radiator Company, Buffalo, N. Y. This is a very attractive addition to the line of radiators that are on exhibition.

JOHN A. SCOLLAY, 74 Myrtle avenue, Brooklyn, has opened a very attractive office at 89 Centre street, N. Y. The floors are stained, with a handsome rug in the center, and the walls are frescoed in harmonious colors. Furniture of quartered oak adds to the surroundings. On a table the Scollay hot water thermometer is shown in its various styles in a nickel plated pipe stand, with literature pertaining to it and to the Scollay boilers for house heating and for greenhouse work. A platform is ready for the sample boilers that are being prepared to show the visitors from the steam and hot water heating trades.

THE STANDARD RADIATOR COMPANY of Buffalo, N. Y., have opened an office at 206 Centre street, which is under the management of John J. Leitch, formerly with Robert Leitch & Sons, Washington, D. C. The new headquarters fronts on Centre street and runs through to Baxter street, with a well lighted sample room and a large storage capacity. Samples of their varied line of radiators are being decorated for the showroom, and a carload of radiators for stock is being received. Mr. Leitch has just returned from a visit to Washington, where he has successfully brought the Standard radiators to the notice of the School Board.

J. J. WILSON called at the office of *The Metal Worker*, on his way to Troy, to visit the house he represents on the road, the Fuller & Warren Company. He reports some good sales recently in hot water apparatus and combination heaters.

Heating and Ventilating Engineers.

The Board of Managers of the American Society of Heating and Ventilating Engineers met on Thursday afternoon and completed the arrangements and programme for the annual meeting on January 22. The sessions will open at 10 o'clock on the morning of the 22d in the building of the American Society of Mechanical Engineers, at 12 West Thirty-second street, New York, and will continue three days. Members will receive next week copies of the programme, the features of which are the president's address, eight papers by members, selected topics for discussion and the election of officers. No special hotel arrangements have been made, as the place of meeting is in the midst of a hotel district of the city.

THE LETTER BOX.

Questions in Steam Heating.

From J. N. G., *Peoria, Ill.*—Please answer the following questions in *The Metal Worker:* What radiating surface will a 40 horse-power engine (plain slide valve) supply in 1-inch pipe, and what is an easy rule for figuring the same? What proportion should be used in factory and also in an office? In the disposal of condensed water should it be permitted to run by gravity into a closed receiver and pumped back into the boiler, or would you advise the use of a common float trap, with discharge to the sewer? What is the best and most practical method of building floor coils, manifolds and return bends, and what provisions are made to keep the pipes in place? Right and left return bends, which are the best? or are two pipe bracket coils to be preferred? What is the practical way of putting up miter coils along the walls, giving the grade and distance of supports for hook plates to screw on? What is the best position for air vents in these different coils, and, finally, what is the most suitable position for back pressure valve and live steam connection?

Answer.—The initial pressure of the steam in the boiler of the engine named not being given we will assume it to be 60 pounds gauge pressure. The engine being stated to be a plain slide valve engine, this implies absence of any special cut off more than can usually be effected with such a valve, or on the average a cut off of about three-fourths of the stroke. Under such circumstances of working it may confidently be assumed that if the engine actually develops 40 indicated horse-power it will discharge from its exhaust at least $45 \times 40 = 1800$ pounds of steam per hour. As usually applied 30 pounds of steam will supply per hour 300 feet in length of 1-inch pipe for heating, or, for an inside figure, say 270 feet, this being about 90 square feet of heating surface. We have, therefore, as a safe figure for the entire heating surface which can be carried by the exhaust of a plain slide valve engine developing 40 horse power, with 60 pounds boiler pressure, $\frac{1800}{30} \times 270 =$ 16,200 feet run of inch pipe, or about 5400 square feet of external surface of such pipe. From this operation we may deduce a rule for calculating the amount of heating surface which the exhaust of such a steam engine will carry.

1. Ascertain the weight of water evaporated by the boiler per hour to run the engine, which may be practically assumed to be the weight of steam in pounds delivered at the exhaust.

2. Divide this weight by 30 (the number of pounds of steam required to supply about 90 square feet of inch pipe radiating surface) and multiply the quotient by 270; the result will be the number of feet in length of inch pipe which the exhaust steam will supply for heating purposes.

This weight of water evaporated per hour may either be calculated from indicator diagrams taken from the engine cylinder, or it may be experimentally determined by weighing the water fed to the boiler. The use of indicator diagrams is the most expeditious and easy way of arriving at the water consumption, but if care be taken an accurate result may be obtained by weighing the feed water.

The use of a float trap for discharge into a sewer of the condensed water would be very uneconomical practice. All the heat contained in this water and thrown away would thus have to be supplied to new feed water. Besides, water after having been evaporated and condensed is in the very best state for use again in the boiler, being freed from air, which is always absorbed in cool water freely exposed for some time to the atmosphere, and having deposited its mineral impurities that produce incrustation in the boiler. Instead, therefore, of allowing the condensed water to run to waste, it ought to be continuously returned to the boiler.

As to amount of pipe necessary respectively for factory and office, this should be estimated with reference to local conditions. If the labor performed in the factory required much muscular exercise, from 60° to 65° of temperature is as much as will be comfortable to the workmen. If the work is light and done by women, and if there is little or no artificial ventilation, such ventilation as is obtained in cold weather being by air entering through crevices at doors and windows, &c, 70° F. will be required; and if the factory floors are, say, as large as 25 x 50 feet in a reasonably well constructed building, a rough approximation to the amount of surface could be made by allowing for such floors 3 feet of inch pipe for every 100 cubic feet of space in the rooms, in a climate where the lowest outside temperature is about 10° F. This is for a large well built factory building, as, for example, a shoe factory containing, say, six such rooms, and employing 30 to 50 people in a room. For smaller establishments it might be necessary to use 3 feet of inch pipe, or its equivalent heating surface, for every 80 or 90 cubic feet of space in the rooms, or even more surface. Only from knowledge of the existing conditions can a proper estimate be made of the heating surface needed for any particular case. For offices the proportion of heating surface ranges from 3 feet of inch pipe to every 40 cubic feet of space to 3 feet for every 60 or 80 cubic feet, according to size, location, usual number of occupants, &c. It is impossible to give a general rule for amount of heating surface as related to size of rooms that will apply to every case.

If our correspondent is favorably located to obtain steam fitters' supplies he can buy coils of inch pipe cheaper than he can make them. It is rarely required to use right and left return bends in making up coils, except when manifolds are used, and unless the situation compels the use of manifolds the latter are not desirable. Plain flat coils of about six pipes with common return bends, if the situation admits, of from 10 to 16 feet in length, or two-pipe bracket coils, are the best whenever they can be used. If these cannot conveniently be purchased ready made they can be made on the premises by any steam fitter who is competent to do even the simplest job of steam heating work. Our correspondent ought not to make the mistake of supposing that such a job as he proposes can be well done by any one except a skilled steam fitter. As to air valves, they should be placed in or near the outlets of radiators. In flat wall coils the steam should enter the upper pipe of the coil and the steam and condensed water pass out of the lower pipe. An even number of pipes in the coil brings inlet and outlet valves to the same end of the coil, which is convenient. Six pipes high in flat coils work excellently.

The position of the valve for admitting steam to the heating system direct from the boiler, which is what we understand our correspondent to mean by "live steam connection," must be governed entirely by circumstances of which we have no knowledge. The most we can say is that the connection should be in a handy place for the engineer who has to use it, and our preference would generally be for an independent connection direct with the steam dome of the boiler. As to back pressure valve, if a suitable trap be used for returning the condensed water, such a valve will not be needed except when the trap needs attention. But a dis-

charge pipe to sewer, attached to pipe leading to trap, with a common discharge trap, ought to be provided, to meet cases whenever some repair or adjustment of the return trap is needed, and the necessary valve in the pipe would, we should think, then be the only back pressure valve needed.

If box coils are to be used they should be purchased direct of the manufacturers of such coils, as they can be bought much cheaper ready made than they can be constructed on the premises, and will be tested and guaranteed by the makers. Such coils will have the needed inclination of pipes, and only have to be set level on proper supports, which are also supplied by the manufacturers. Plain flat coils may be made on the premises. The component pipes of such a coil ought to have an inclination of 1 inch in 16 feet or 1 inch in 12 feet, if this can be got conveniently. Supports for such coils can be bought from any dealer in steam fittings, designed for attachment by screws to wall cleats of wood. About 6 to 8 feet between supports is a usual distance for coils of from 12 to 16 feet in length, and ten feet is near enough for very long coils. For mid floor positions box coils are preferable, as occupying less space. For a mid-floor flat coil supports of 1¼ x ¼ inch merchant bar iron bent at an angle to get a foot that can be screwed to the floor, and drilled or punched to receive through bolts on which the pipes can rest, can be made by a local blacksmith.

In calculating surface for inch pipe coils estimate each return bend as the equivalent of 7 inches length of inch pipe. This is not exact but near enough for practical purposes. Thus an inch coil with 60 feet of inch pipe and 12 return bends would have a surface about equal to 67 feet run of inch pipe alone.

Double Furnaces.

From W. S., *Baltimore.*—When a building is to be heated by means of a warm air furnace, it is usual to employ a single furnace for the purpose, and one that is supposed to be of sufficient heating capacity to warm the building during the coldest weather. Such a furnace would naturally be much too large for heating the building during mild weather, as it would be difficult to keep the fire burning properly without producing more heat than was required. I would like to inquire of the readers of *The Metal Worker* what experience they have had with double furnaces. That is, two small furnaces, their united capacity being sufficient to properly warm the building, and set near to each other and connected by means of a double bonnet. From this bonnet the pipes would be connected with the rooms above in the usual manner. The cold air box could be provided with branches, so that each furnace would receive its proper supply of air. A damper or slide placed in each branch would enable one to regulate the supply of air to each furnace, or shut off the supply if one of the furnaces was not in operation. With only one furnace in use, it is probable the pipes over this one would receive the most heat, but this defect could be obviated to a great extent by regulating the pipe dampers and the registers. The advantages to be derived from this plan would be that during mild weather only one furnace would be used for heating, thus saving fuel. During cold weather the two furnaces would be required.

Kerosene as a Wood Preservative.

From LAMBERT, STOUGHTON & COOPER. *Philadelphia, Pa.*—On page 28 of *The Metal Worker* of December 29 we notice an inquiry from Summit Station, N. Y., as to the preserving qualities of kerosene oil, &c., on wood. For your correspondent's guidance, we would say that crude petroleum is decidedly the best for the purpose he wishes to use it, but we believe that Fernoline is still better than the oil. The latter is used by pile drivers along the Atlantic Coast, and also by railroad companies in some parts for preserving wooden ties. The cost of the latter is more than the former, and if your correspondent would like to know more about it we will furnish him with all the information we possess if he will address us on the subject.

Choked Water Backs.

From J. W., *Virginia.*—The water front in a kitchen range, in this place located in a basement somewhat lower than the main pipe in the street, fills up with lime incrustations about once a year, or sometimes in less time, and has to be replaced with a new one, thereby submitting the owner to no small annoyance and expense. Can you explain the cause of this or suggest a remedy? Is the fault with the range or plumbing? Other ranges similar in construction, except that they are higher than the water main, are not affected in this way.

Answer.—Our correspondent's case would be a simple one, except for his statement that his range chokes up once a year, while others above the water main do not. We do not see what influence the position of the range has in the matter. We think it more likely that the higher ranges have larger water back connections, or for some other reason are not subject to the trouble. This matter has been discussed in the past in *The Metal Worker* and various remedies have been suggested. Our correspondent is, of course, aware that the difficulty is due to the water depositing the lime held in solution, and this forms a crust, the same as it does in steam boilers. The last time the matter was discussed in our columns three separate remedies were suggested. The first was that the water back connections be made of 2½ inch pipe, so that the incrustation would take a very much longer time in forming. This delayed, but did not remedy the trouble. A second suggestion was to make the water back a secondary heater—that is, the connections were made to a coil within the range proper and there was a little expansion tank connected with the upper pipe. In this way the same water was used over and over again and transmitted its heat to the water in the range boiler. After the first deposit had been made there would be no further accumulation. A third suggestion was that the trouble would be obviated by preventing the water ever reaching the boiling point. The correspondent who made that suggestion said that by reducing the size of the water back so that the temperature of the water was kept below the boiling point the alkali was not deposited. He had followed this practice with great success in places where much trouble was occasioned by alkali water. We trust some of these suggestions may prove of assistance to our correspondent.

Rusting of a Tin Roof.

From W. B. K., *Penn's Grove*, N. J.—In answer to the inquiry of "R. H. C.," Grafton, Ill., that appeared in *The Metal Worker* of December 22 about rusting of a tin roof on the bottom, I think he will find that the shingles have been penetrated by either steam or gas from the room below. My opinion is that IC terne, well painted on both sides and kept painted on the top, will last from twenty to thirty years. Putting tin over old shingles is quite practicable, and if a cleat board is used the work can be done as smooth and flat almost as over sheathing. The first thing to take into consideration before putting on a roof is to find out what the room below is to be used for. If for a laundry it is necessary to sheath the roof as tight as possible, and then to use oiled sheathing paper and paint the bottom side of the tin well with metallic brown. If over bedrooms or ordinary dwelling lofts it is not necessary to use either sheathing paper or paint, as the underside of the tin is not apt to rust through in such places. I had a roof last year to take off, and put on a new one, on account of gas from the lodge room caused by stove gases ascending from the room through a ventilating ceiling register in the loft. The ventilator in the roof was, through an oversight of the tinner who had put on the first roof, made independent of the ceiling ventilator and not connected directly with it.

Base Burning Stoves.

From H. H., *Rochester, N. Y.*—Please inform us through *The Metal Worker* when and by whom base burning stoves were invented?

Note.—It is generally supposed that the first magazine or base burning stove designed to heat rooms was patented by David Riz in the year 1770. The principle was applied by James Watt, who, in 1785 was granted a patent for a magazine steam boiler furnace, in which the base of the fuel only was exposed to the direct action of the fire. If our correspondent is interested in going into the subject of the base burning principle a little deeper, he will find in *The Metal Worker* of May 3, 1890, an article entitled "History of the Base Burning Principle as Applied to Stoves, Furnaces, &c," and in the issue of the paper for June 12 of the same year will be found another article bearing on the subject.

TIN PLATES.

Net Weight of Tin Plates.

Through the courtesy of Bruce & Cook, Water street, New York, we are permitted to reprint from their calendar the accompanying valuable table, giving the net weight per box of tin plates, computed on the basis of 10 x 14, 225 sheets; or, 14 x 20, 112 sheets. Referring to this table in their New Year's circular they say:

"During the last few years plates lighter than the old standards have come into such general use that we have made up a table showing the net weights of all leading sizes, and at the basis weights most in use. This will enable you to tell at a glance the weight of the different sizes and thicknesses, and also to be sure that weights received are same as ordered without a long calculation."

There is not a little complaint of the selling of light weight plates for standard, but where it is suspected the use of this table will enable the purchaser to readily check all doubtful boxes.

Net Weight Per Box Tin Plates.

Basis 10 x 14, 225 Sheets; or, 14 x 20, 112 Sheets.

Trade term		80lb.	85lb.	90lb.	95lb.	100lb.	IC	IXL	IX	IXX	IXXX	IXXXX
Weight per box, lbs.		80	85	90	95	100	107	128	135	156	176	196
Size of sheets.	Sheets per box.											
10 x 14	225	80	85	90	95	100	107	128	135	56	176	196
14 x 20	112	80	85	90	95	100	107	128	135	156	176	196
20 x 28	112	160	170	180	190	200	214	256	270	312	352	392
10 x 20	225	114	121	129	136	143	153	183	193	223	251	280
11 x 11	225	69	73	78	82	86	92	111	117	135	152	169
11 x 22	225	138	147	156	164	17[illegible]	184	222	234	270	304	339
11½ x 23	225	151	161	170	179	189	202	242	255	295	333	370
12 x 12	225	82	87	93	98	103	110	132	139	160	181	202
12 x 24	112	82	87	93	98	103	110	132	139	160	181	202
13 x 13	225	97	103	109	115	121	129	154	163	188	212	236
13 x 26	112	97	103	109	115	121	129	154	163	188	212	236
14 x 14	225	112	119	126	133	140	150	179	189	218	246	274
14 x 28	112	112	119	126	133	140	150	179	189	218	246	274
15 x 15	225	129	137	145	153	161	172	206	217	251	283	315
16 x 16	225	146	155	165	174	183	196	234	247	285	322	358
17 x 17	225	165	175	186	196	206	221	264	279	322	363	405
18 x 18	112	93	98	104	110	116	124	148	156	180	204	227
19 x 19	112	103	110	116	122	129	138	165	174	201	227	253
20 x 20	112	114	121	129	136	143	153	183	193	223	251	280
21 x 21	112	126	134	142	150	158	169	202	213	246	277	309
22 x 22	112	138	147	156	164	172	184	221	234	270	304	339
23 x 23	112	151	161	170	179	189	202	242	255	295	333	370
24 x 24	112	164	175	185	195	204	220	263	278	321	362	404
26 x 26	112	193	205	217	229	241	258	309	326	377	424	472
13½ x 19½	112	75	80	85	89	94	100	120	127	147	165	183
14 x 18¾	124	83	88	93	98	103	110	132	139	161	182	202
14 x 19¼	120	83	88	93	98	103	110	132	139	161	182	202
14 x 21	112	84	89	95	101	105	112	134	142	164	185	206
14 x 22	112	88	94	99	105	110	118	141	149	172	194	216
15 x 21	112	90	95	101	107	113	120	144	152	176	197	220
16 x 20	112	91	97	103	109	114	122	146	154	178	201	224
14 x 31	112	124	132	140	147	155	166	198	209	242	273	304
12½ x 17 D	100	..	...	...	...	...	98	...	126	147	167	187
17 x 25 D	50	...	...	...	...	...	98	...	126	147	167	187
15 x 21 D	100	..	...	...	...	...	145	...	187	218	248	277

A New Tin Plate Plant.

The Totten & Hogg Iron & Steel Foundry Company of Pittsburgh, Pa., manufacturers of rolling mill, tin plate machinery and engines, have just received one of the largest orders that has been placed with any Pittsburgh company for many years. This order is from the Laughlin Nail Company of Wheeling, W. Va., and is for a complete tin plate plant. The plant will be erected at Martin's Ferry, Ohio, and when completed will be one of the finest, largest and best arranged tin plate plants in the United States. The machinery to start with will consist of six 24-inch hot mills and four 20-inch cold mills, but room has been provided for four more hot mills and three more cold mills, making a total of ten hot mills and seven cold mills. The mill buildings will be made of iron. The tinning house and packing room will be of brick. The hot mill building will be in size 70 x 140 feet and 20 feet high from floor level to lower chords, with shed to cover heating and pair furnaces 20 x 140 feet, and shed to cover annealing furnaces 25 x 140 feet. The cold rolling mill building will be 62½ x 140 feet, 24 feet high from floor level to lower chords, with shed to cover annealing furnaces 25 x 80 feet. The boiler house will be 40 x 88 feet. The tinning house will be 60 x 75 feet, and the packing room 60 x 50 feet. Both the hot and cold mill buildings will be provided with traveling cranes. The Totten & Hogg Iron & Steel Foundry Company have the contract for everything complete, from the ground up, including buildings and furnaces. The machinery they furnish will consist of hot mills complete, with all the doubling and trimming shears; cold mills complete; a 1000 horse-power ÆEtna rolling mill engine complete, with gears and countershafts for driving hot mills; a 700 horse-power ÆEtna rolling mill engine complete, with gears and countershafts for driving the seven cold mills; a 100 horse-power engine with line shafting, bearings and pulleys, for driving doubling and trimming shears, and a 75 horse-power engine for driving the tinning house; a boiler plant complete, to supply steam for the four engines; all the machinery for the tinning house, consisting of six Thomas & White, one Phillips and one Morewood tinning machines, six branning machines, one double and one single dusting machine, one Gray pickling machine, one 1000 horse-power heater, two boiler feeding pumps, each large enough to supply ten 100 horse power boilers with water; one steel water tank, one 38 inch roll lathe, 60 annealing boxes, and all the floor plates required about the plant. The entire plant was designed by F. I. Freeman, the mechanical engineer of the Totten & Hogg Iron & Steel Foundry Company, who will himself, assisted by his son, S. L Freeman, take charge of the erection and starting of the plant at Martin's Ferry. The Totten & Hogg Company also have an order for changing the nail plate train, which was built by them for the Laughlin Nail Company many years ago, into a train for rolling the sheet bar for the new plant and to furnish the new shears and roller tables for same. This arrangement enables them to cut the sheet bar to proper lengths as fast as it is rolled.

SCRAP

A UNITED PRESS CABLE DISPATCH from London of January 6 reported as follows: "Many tin plate works in the Swansea district are closing their contracts. Some 3000 men were discharged yesterday in accordance with previous notices. The cause of the reduction is the decrease of the American demand. T. N. Hood, London agent of the Glanrhyd Tin Plate Company, told the United Press correspondent yesterday that some time ago the Welsh tin platers extended all their facilities in anticipation of a heavier demand from the United States, but the demand had not come and the new plants are useless. Tin plate prices now, he said, were the lowest on record." From other sources of information it appears more likely that the closing down of so many works is primarily due to the failure of the makers to come to a settlement of the wage question with their workmen.

THE ANNUAL REPORT of the New York Chamber of Commerce for the fiscal year ending June 30, 1894, places the value of foreign tin and terne plates and taggers tin entered at this port during that period at $7,167,814. The aggregate receipts at all other ports are estimated at $7,442,474, making the total value of tin plate imports $14,610,488.

IN OUR ALPHABETICAL LIST of American tin plates in last week's issue the name of Clifton, a bright charcoal plate, manufactured by Follansbee Bros. Company, successors to James B. Scott & Co., Pittsburgh, Pa., was inadvertently omittted, although noted opposite the firm's name on page 42.

THE PROJECT of erecting a co-operative tin plate plant by former employees of Wallace, Banfield & Co., Limited, at Irondale, Ohio, has been abandoned.

THE CRESCENT SHEET & TIN PLATE COMPANY, Cleveland, Ohio, expect to begin the manufacture of black sheets about April 1. The company will ope-

rate this department of their plant first, and later on the manufacture of tin and terne plates will be taken up. The buildings now in course of erection are a steel hot mill building, 105 x 175 feet, and a combination building containing the annealing, pickling, cold rolling, tinning and warehouse departments, which will be all steel and brick, 105 x 168 feet, with a wing 48 x 48 feet. The buildings are being put up by the Shiffler Bridge Company of Pittsburgh. The Industrial Works, Bay City, Mich., have the contract for the supply of two electric cranes, and the Elwell-Parker Electric Company, Cleveland, Ohio, will furnish a generator to run these cranes, together with 15 arc and 60 incandescent lights.

THE JUNCTION IRON & STEEL COMPANY of Mingo Junction, Ohio, formerly the Junction Iron Company, and who succeeded to the business of the Laughlin & Junction Steel Company recently, announce that after February 25 next they will be prepared to supply soft steel tin plate and sheet bars "boshed," and cut to any desired length and rolled to any thickness from ⅛ inch up; also small steel billets from 1¼ inch, square or round, up to 3 inches. These billets will be of the grade of goods known as raw materials for the manufacture of street and railway cars, agricultural implements, bolts, wagon and carriage axles and many other lines of iron and steel goods. Contracts have been placed for the additional machinery, and the work of installing will go forward as rapidly as possible.

THE TIN PLATE PLANT of the Ellwood Tin Plate Company, Ellwood City, Pa., is now in operation to nearly full capacity. Three mills are running, and the tinning department will probably be put in operation this week. As is already known, this concern are running on a non-union basis, and have experienced but little difficulty in finding competent workmen as fast as places could be made for them.

THE MONTHLY RETURNS of the British Board of Trade for December show the total exportation of tin plates from British ports during that month to have been 38,000 tons, against 23,000 tons in December, 1893. Of this amount 24,000 tons were shipped to the United States, as compared with 14,000 tons in the last month of the previous year. The total exports of tin and terne plates from Great Britain to this country last year aggregated nearly 205,000 tons against 255 500 tons in 1893, a falling off of over 50,000 tons.

THE AMERICAN TIN PLATE COMPANY, Ellwood, Ind., will start up a new addition of four mills about January 15, when some 250 more men will be given employment at their works.

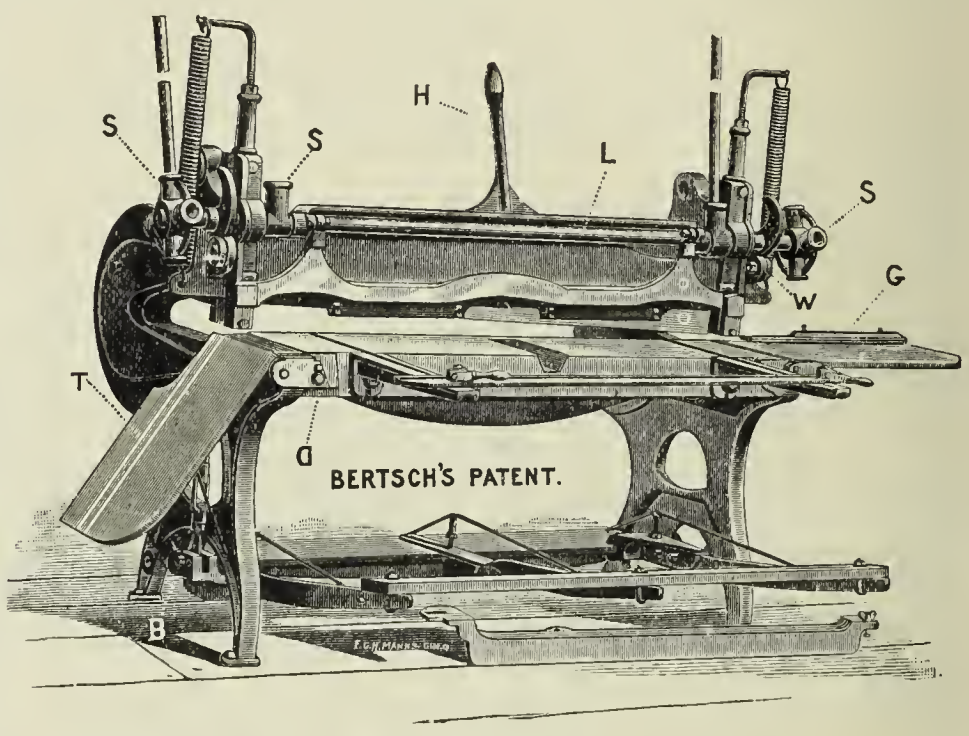
A CABLE from Liverpool, England, announces the death on January 6 of Henry Nash, the head of the well-known house of Henry Nash & Co., tin plate and metal merchants of that city. Mr. Nash, who was among the most prominent members of the trade, was well known in the United States as representing a number of the largest metal houses in this country.

BENJ. MORRISON, who for some time has acted as the representative of N. & G. Taylor Company, at 23 Water street, New York City, has resigned his position and severed his connection with the firm. Mr. Morrison will, it is understood, embark in the metal business on his own account.

THE CALENDAR for which we are indebted to James A. Coe & Co., 106-108 Mulberry street, Newark, N. J., is an exceedingly appropriate and handsome publication. The calendar proper, which is a pad of 12 leaves attached to the bottom of the card, is neatly printed and plain, and carries beneath it the full calendar for the year in blue ink. The feature of the publication, however, is the card itself, which has a background of silver that is a perfect imitation of fine terne plate. The firm name, with the announcement "Iron and Steel, Bright Tin, Roofing Plate, Copper, Zinc, Solder, Carriage and Heavy Hardware," is printed in white, with a blue shade line.

Extra Heavy Gap Shear.

We show in the accompanying illustration a type of the extra heavy No. 22 5-foot 15-inch throat gap shear for No. 14 iron, built by Bertsch & Co, Cambridge City, Ind. The patent lever attachment L in front of the knife bar has extra heavy sockets, S, at both ends, and is also operated in conjunction with the treadle for heavy work. For ordinary or light work the treadle can be used entirely independent of the lever. It is pointed out that with this attachment the gap shear is complete, and for squaring and slitting is practically two machines in one. It is made for all lengths up to 6 feet or longer for light work, with 12, 15, 18 and 21 inch throat. The shears are made to be operated by either hand or power. Particular attention is called to the patent extension drop leaf table with parallel gauge, G, which is described as indispensable for continuous accurate cutting of long sheets. It is also pointed out that it will facilitate the work and avoid marking off in slitting and trimming sheets, as the gauge is adjusted in line with the blades, properly guiding the sheet through the throat. The extension table on the left has suitable parallel shearing lines, T, for trimming, and a special shear line indicator is attached to the last cutting end to indicate the cutting edge of the lower blade, which can be seen at the end when cutting metal that is longer than the blades.



Extra Heavy Gap Shear.

Trade in Tinners' Tools.

A firm of Eastern manufacturers, making a heavy line of tinsmiths' machines and tools, writing on the condition of trade refer to the three kinds of competition which they have to struggle with, and classify them as follows:

1. *Honorable Competition.* This seeks to improve the quality of its product and cheapen its cost of production, giving to buyers their just share of such improvement.

This kind of competition benefits everybody.

2. *Ignorant Competition.* This rises from inexperience, or from careless or defective bookkeeping. The manufacturer does not know what his goods cost, nor how much to allow for incidental expenses and unforeseen emergencies. Consequently his selling prices demoralize the market for a time, resulting at last in his own ruin. Then his plant goes into a receiver's hands, his stock is sold below cost and his plant is bought up by some speculator as ignorant as himself, and the same experience is repeated over and over again till the last brick and the last dollar are gone.

This kind of competition benefits nobody.

3. *Rascally Competition.*—In this the competitor sells deliberately and knowingly on an insufficient margin, either for the sake of grasping the whole world or of ruining his competitors.

This kind of competition is the bane of business, and pleases no one but the devil and his angels.

Almost all the East Liverpool, Ohio, potteries started into operation last week on full time.

The *Journal of Commerce* estimates the fire losses of the United States and Canada for the year 1894 as $127 450,000. The 1893 losses were $156,445,875 and those of 1892 $132,704,700.

The Philadelphia *Ledger* estimates that the production of anthracite coal in 1894 will aggregate over 41,000,000 tons, a decrease of over 1,600,000 tons compared with the output of 1893.

ROOFING AND CORNICE.

National Association of Iron Roofing Manufacturers.

(*By Telegraph.*)

The ninth annual meeting of the National Association of Iron Roofing Manufacturers convened in parlor A of the Burnett House, Cincinnati, Ohio, Thursday, January 10, with President E. E. Souther of St. Louis in the chair. At 9 a.m., the meeting having been called to order by the chairman, an invitation was extended to the manufacturers of galvanized iron conductor pipe, eave trough, elbows and fittings, who had met on Wednesday for the purpose of organizing an association, to be present, which was accepted by many.

After a speech by the president the report of the Executive Committee was read and adopted, as was also that of Secretary and Treasurer Hyndman. The appointment of a committee to nominate officers to serve the ensuing year, composed of A. L. Andrews, J. E. Annis and E. C. Ewing, was followed by a resolution, which was carried, to omit the No. 27 gauge when quoting prices on corrugated or roofing iron, and otherwise confining such quotations as much as possible to the even gauge. This is quite an important feature, and will commend itself to all manufacturers whether members of the association or not.

A second committee, composed of J. G. Battelle, G. E. Needham, H. P. Lloyd, Joseph Blechle and R. F. Graham, was instructed to formulate and suggest additional plans for improving present low prices and to deal with the unsatisfactory condition of the iron roofing business. Adjournment of morning session was then taken, to meet again at 2 p.m.

Afternoon session was called to order at 3 p.m. A number of suggestions and plans for improving the condition of the business and establishing better prices were passed upon, but no definite action was taken, the meeting adjourning with the election of the following officers for the ensuing year, who will also act as an Executive Committee:

President, J. C. Biechle of the Berger Mfg. Company, Canton, Ohio.

Vice-president, Chas. H. Conner of Chas. H. Conner & Co., Louisville, Ky.

Secretary and treasurer, R. J. Hyndman of the Hyndman Iron Roofing Company, Cincinnati, Ohio.

At the close of the meeting an elaborate banquet was tendered to the visiting and local members of the association and press by the American Roofing Company, Globe Iron Roofing & Corrugating Company and the Hyndman Steel Roofing Company, Major H. P. Lloyd acting as toastmaster.

Following is a list of members in attendance at the meeting:

Chas. H. Conner, Louisville, Ky.
Columbia Corrugating Company, Chicago.
Jas. A. Miller & Bro., Chicago.
Allen's Corrugating & Cornice Works, Chicago.
Acme Roofing Company, Canton, Ohio.
Chattanooga Iron & Steel Company, Chattanooga, Tenn.
Wheeling Corrugating Company, Wheeling, W. Va.
Fostoria Steel Roofing Company, Fostoria, Ohio.
Rhodes, Dickelman & Co., Forest, Ohio.
Berger Mfg. Company, Canton, Ohio.
J. H Eller & Co., Canton, Ohio.
Kanneberg Roofing Company, Canton, Ohio.
Cincinnati Corrugating Company, Piqua, Ohio.
Acme Roofing Company, Canton, Ohio.
Garry Iron Roofing Company, Cleveland, Ohio.
E. E. Souther & Co., St. Louis, Mo.
American Roofing Company, Cincinnati and St. Louis, Mo.
Canton Steel Roofing Company, Canton, Ohio.
Cambridge Roofing Company, Cambridge, Ohio.
Ætna-Standard Company, Bridgeport, Ohio.
Globe Iron Roofing Company, Cincinnati, Ohio.

Eave Trough and Conductor Pipe Manufacturers.

A representative gathering of the Galvanized Iron Conductor Pipe, Eave Trough and Elbow Manufacturers of the United States met in session at the Burnet House, Cincinnati, Ohio, Wednesday, January 9. The meeting was called to order by Chairman T. C. Snyder of Canton, Ohio, and the roster being read the following firms were shown to be in attendance or represented, viz :

W. Austin Obdyke & Co., Philadelphia, Pa.
Marlin & Co., Alleghany, Pa., by H. A. Marlin.
Thomas Lee, Cincinnati, Ohio.
Acme Roofing Company, Canton, Ohio.
Chattanooga Iron & Steel Company, Chattanooga, Tenn., by J. E. Annis.
Wheeling Cornice Company, Wheeling, W. Va., by E. C. Ewing, Alex Glass, W. L. Ewing.
Clark, Quien & Morse, Peoria, Ill.
Fostoria Steel Roofing Company, Fostoria, Ohio.
Canton Steel Roofing Company, Canton, Ohio, by T. C. Snyder, president.
Rhodes, Dickleman & Co., Forest, Ohio, by F. B. McMillin.
Berger Mfg. Company, Canton, Ohio, by E. Langenbach, secretary; J. Blechle, president.
J. H. Eller & Co., Canton, Ohio, by J. H. Eller, president.
Kanneberg Roofing Company, Canton, Ohio.
Cincinnati Cornice Company, Piqua, Ohio, by J. G. Battelle and James Hicks.
Acme Roofing Company, Canton, Ohio.
Bowers & Galpin, Binghamton, N. Y.
Columbia Corrugating Company, Chicago, Ill.
Jas. A. Miller & Co, Chicago, Ill.
David Lupton Sons, Cleveland, Ohio.
Allen's Corrugating & Cornice Works, Chicago, Ill.
Ferd. Dieckmann, Cincinnati, Ohio.
Miller Iron Company, Providence, R. I.
Scottdale Iron & Steel Company, Scottdale, Pa., by T. F. Graeser.

The object of the meeting was principally to discuss rules and regulations governing the production and sale of the material in question, such as standard measurements and uniform price-lists. At present the difference in sizes of pipe are not at all consistent with the existing list, this being also the case with eave trough. Under the present system in vogue manufacturers have learned that while a profit was assured in the sale of a certain size, based upon the existing list price, yet there proved to be a considerable loss when another size was in question. The matter of reduced freight classification is also another important feature that was deliberated upon, although much had already been accomplished in that direction through the personal efforts of T. C. Snyder, chairman, previous to the present meeting.

A principal feature discussed was the fact that the industry is thoroughly overdone, the manufacturer protesting that not one of them is making a single

dollar profit. No suggestions that could be immediately adopted were brought forth, and with the exception of making several changes in the present price-list nothing was done.

The election of officers resulted as follows:

President, C. D. Clark of Clark, Quien & Morse, Peoria, Ill.

Vice-president, E. L. Langenbach of Berger Mfg. Company, Canton, Ohio.

Secretary and treasurer, Alex. Glass of Wheeling Corrugating Company, Wheeling, W. Va.

One fact was emphasized very strongly, that having reference to the productive capacity of the manufacturers of the goods in question, it being stated that the total number of feet sold in 1894 amounted to between 7,000,000 and 10,000,000, while one concern alone was capable of producing 15,000,000 feet, there being several others possessing almost equal productive facilities. The title of the organization is the United States Eave Trough & Conductor Pipe Association.

Sheet Metal Class at the Pratt Institute.

The sheet metal pattern cutting class at the Pratt Institute Trade School, Brooklyn, has entered on its second quarter's work with most encouraging prospects. Instructor Louis Rouillon speaks in enthusiastic terms of the intelligent interest displayed by the pupils and the progress made by them since the class was started. In this second term the pupils are being taken into the practical sphere of sheet metal pattern cutting, including roofing and cornice work. Both Mr. Rouillon and Professor Richards express themselves as being eminently satisfied with the results so far attained by this new class. Naturally, at the start, it is more or less in the nature of an experiment, and the hard times have prevented a number of candidates who wished to enter the class from doing so. By the commencement of the next season, in September, however, it is expected that a much larger number of applicants for instruction will present themselves. Mr. Rouillon is now drawing out a detailed scheme of instruction, which he proposes to follow, and by which the pupils will be provided with as thorough an education, theoretical and practical, in sheet metal work as possible. The class is held on three evenings of the week, Monday, Wednesday and Friday, from 7.30 to 9.30; and the regularity of the pupils in their attendance is reported as very gratifying.

KURTZ & Co, 2427–29 Calumet avenue, Chicago, are to furnish the copper cornices, bay windows and skylights for the residence of George F. Harding, Thirty-eighth street and Elmwood place.

The Roofing Trade in the West.

The following extract from a letter with which we have been favored by a large roofing concern in the West presents a cheerful view of the outlook for the roofing trade in that section of the country: "Take it all in all, they write, the outlook for business in our line in Missouri, Kansas, Oklahoma and Indian Territories is decidedly brighter than at any time for the last three years, except, possibly, in the early part of 1893, when everything opened very auspiciously till interrupted by the great panic. But we think our expectations for 1895 have a better foundation than in the spring of '93, for the reason that plans for improvements at that time were rudely shattered by the panic, though not in many cases entirely abandoned, and many cherished plans have developed and accumulated since, awaiting only an opportune time for execution. This now seems to be at hand. We are receiving inquiries and a few scattering orders from old customers whom we have not heard from for even as long as four and five years; and in answer to inquiries as to why we have not heard from them before, the almost universal reply is that they have not needed anything in our line. This we take as one of the very best indications of a revival of business, and that, coupled with the very low ruling prices, we think will undoubtedly make business good."

FLASHINGS.

THE KNISELY & YELDHAM COMPANY, 68–74 West Monroe street, Chicago, are to furnish the copper work for the residence of Frank J. Wilson, Washington boulevard and Sacramento avenue.

KNORR & BLOCKS, 165 Wells street, Chicago, are to furnish the cornices, skylights and tin work for the building of Lystad & Anderson, 296–298 East Division street.

THE DAY CLASS in tinsmithing, roofing and cornice work, which was to open on January 2 at the New York Trade School, was not started owing to the insufficient number of applications. This is to be regretted, as a competent instructor had been secured and an elaborate course had been decided upon. After it was decided not to open this class, additional applications were received sufficient to warrant its beginning, but unfortunately too late to change the decision. Another attempt, however, will be made next year to start this class. The course of instruction was intended to qualify pupils to work both tin and sheet iron, and teach them all the little tricks of the trade which oftentimes are only secured after a long experience and without which a workman labors under a disadvantage. In addition to this, instructions would have been given in the laying out of work and cutting such irregular shapes in sheet metal as are daily found necessary in this trade.

EMIL SCHAEFER was given the contract for the erection of a three-story, 36 x 40-foot shop at 1321 North Fifth street, Philadelphia, which will be used for the manufacture of sheet metal goods.

JOSEPH JAMES, miner of actinolite, Bridgewater, Ontario, advises that the demand for that material for roofing purposes during the year 1894 showed a very marked increase. He reports having disposed last year of 15,000 bags of 100 pounds each. The principal markets to which he caters are Chicago and Montreal, Canada. He also finds a good trade in Detroit, Mich.; Toronto and Hamilton, Canada, and even as far south as Nashville, Tenn. New markets, he says, are constantly opening up for this material.

THE MONTROSS METAL SHINGLE COMPANY, Camden, N. J., report that their business during the past year was very satisfactory, and that their output showed an increase of about one-third on that of 1893. They are preparing to add new presses and other machinery to their plant with a view to still further increasing their capacity. Among the new goods they contemplate introducing very shortly is a new siding plate, which they believe will be much appreciated by the trade.

THE CARBON PAINT COMPANY of New York City have been incorporated to manufacture water proof and fire proof paints, and to take contracts for roofing. The capital is $100,000, and directors, William Calhoun, Chas. B. Hearn and Thomas D. Prentiss of New York City.

J. J. COLVIN, 79 La Salle street, Chicago, is to furnish the galvanized iron work for the residence of John C. Thompson, North Robey street.

THE ROME MFG. COMPANY, Rome, N. Y., make a fine display of planished and nickel plated copper goods at their New York office at 92 Walker street. Their line of tea kettles begins with the tiny individual kettle and, including the "five o'clock tea," continues to the many styles and sizes for kitchen use. They also make a varied line of handsome tea and coffee pots. Wash boilers of planished copper in all sizes are another of their specialties.

THE STAR DINNER PAIL COMPANY, Allegheny, Pa., have filed a bill in equity in the United States Circuit Court against W. B. Berteles, Son & Co. of Wilkes-Barre, Pa., alleging infringement of a patent pail attachment known as an "ear." The case was argued and decision was reserved.

R. M. WILSON, Rome, N. Y., has many things to interest the plumber at his New York office, 92 Walker street. One is a nickel plated copper boiler that is made for ordinary pressure, or special, to stand high pressure. It is pointed out that the nickel plated boiler is more sightly in kitchens than a copper boiler when the discoloration begins and that the nickel will stand a long time. These boilers can be furnished in sizes up to 100 gallons. They also carry a stock of all sizes and weights of copper lined bathtubs and guarantee the weight of the copper to be as stamped on the tub. One of their specialties is a copper lined tub in hardwood finish, set on nickel plated feet and adapted for the use of outside waste and overflow. This tub is gaining popularity as a sanitary tub and because no carpentry work is required. A wide line of closet tanks and seats of fine grade are also carried, as well as nickel plated bath cocks and basin traps.

THE WISCONSIN STATE ASSOCIATION OF MASTER PLUMBERS held their annual meeting in Milwaukee this week, electing officers for 1895 and discussing improvements in the plumbing laws.

Ventilation.

BY GEO. D. HOFFMAN, CHICAGO.

What a wealth of meaning in the term "ventilation," and yet how few, even among the heating trade, appreciate its full significance. Perfect ventilation of our homes, offices and schools would mean health, happiness and long life. It would also insure such an increase of our vital forces that we would, inside of three generations, be noted among the nations of the earth as the most progressive and most contented. If any one doubts this statement, let him simply stop and think for a moment of the men who are foremost in the line of the world's action. Read the history of their lives, and you will invariably find that these men laid the foundation of their strength and vitality by spending a large portion of their early lives out of doors and amid surroundings that insure a bountiful supply of fresh air every day. A large number of our American statesmen began their lives on a farm and were of necessity compelled to labor long hours in the open air, and at night rettred to rest in rooms which were full of cracks and crevasses through which the air flowed freely. Fresh air! What magic there is in thy touch! The sick made well, the poor and depressed in spirits again see life through rosy glasses after close relations with thee! And yet, while ventilation is only the insurance of a full supply of fresh air in our habitations, there is not only indifference to its introduction, but actual opposition; and this opposition does not always come from ignorant people in the general acceptance of the term, but from architects and other professional men who should know better. The old saying, "Where ignorance is bliss 'tis folly to be wise," is hardly applicable in this case, as ignorance here is so surely followed by evil results that the saying should be reversed and bliss should follow wisdom.

Pure Air and Foul Air.

I could cite any number of leading authorities, and read whole chapters showing the necessities of ventilation and the evil consequences that result from breathing of impure air, but a mere statement of the component elements of air will suffice for this article. If we divide air into 10,000 parts, its composition will be as follows: Oxygen, 2096; nitrogen, 7900; and carbonic acid, 4 parts. When the proportion of carbonic acid in a room is increased from the normal amount of four parts in 10,000 to between six and seven in 10,000, a faint, unpleasant odor is usually perceptible to one entering from the fresh air; if the proportion reaches ten parts the room is said to be close. According to some authorities a full grown man at rest will exhale through the pores of the skin and from his lungs nearly ¾ cubic foot of carbonic acid per hour. Taking a room containing 2500 cubic feet of air in its normal conditton, we find that the air contains 1 cubic foot of carbonic acid. Now, let us suppose this room to be a sleeping room, not ventilated, occupied by two persons eight hours each ntght. If the windows and doors of the room were closed during the eight hours, thc natural portion of carbonic acid would be increased to about 13 cubic feet (or one part to 200), and the occupants would arise in the morning with depressing headaches. A person coming into the room from the outside would declare the air to be "foul," and a man does not need to be a crank on ventilation to reach the conclusion that such a situation would be anything but healthful. This condition could be obviated, to a certain extent, by raising the windows, but that practice is dangerous in its results, is a prolific source of colds and sickness, and as a means of ventilation totally unreliable, not to mention the morning's discomfort of arising in a cold room.

Function of Ventilation.

But what is ventilation? Ventilation is the process of replacing foul, impure air in a confined space, with pure fresh air. Please note the word "replacing." Some very high authorities define ventilation as the process of simply diluting the confined foul air with fresh air sufficient to maintain a certain standard of purity, but in the writer's opinion the word replacing more clearly defines the process in common practice among heating engineers. Especially is this true in winter, as the fresh air is generally heated to a higher temperature than the air in the building, and as the colder air is a denser, heavier body than the warm air, the result is a gradual displacement of the cold impure air by warm fresh air.

The question which naturally presents itself at this point is the quantity of fresh air necessary to insure anywhere near perfect ventilation. Authorities differ radically on this question, but the majority seem to favor 30 cubic feet per minute per person, or 1800 cubic feet per hour. With this data in mind it is very essy to determine the amount of fresh air necessary to furnish each hour by multiplying 1800 cubic feet by the greatest number of persons occupying the building at any one time. In making this computation it is also necessary to take into consideration the number of gas lights burning. A simple gas jet burning full head will vitiate about 1800 cubic feet per hour per cubic foot of gas burned. Ordinary gas burners are rated to consume from 3 to 4 cubic feet per hour, and if we take the maximum quantity we have each light requiring 7200 cubic feet of air per hour while burning. Some writers argue that as gas jets, generally speaking, are only in use for an average of six hours per day of 24 hours, that the quantity of air required for lights should be divided by 4, so as to distribute the volume of air required over the 24 hours. In the writer's opinion this is all wrong. An ordinary, good system of ventilation should supply the maximum amount of air required during given hours of the days. Suppose, for instance, we adopted the rule for distrlbuting the gas vitiation over the 24 hours, then, so far as the gas jets are concerned, we would only have to provide for one-quarter of 7200 cubic feet, or 1800 cubic feet, per hour for each gas jet. Now, let us see how this would figure out. For example, take an ordinary ten room house, containing 20,000 cubic feet of air, occupied by stx persons, burning six jets during six hours. Giving each person 1800 cubic feet per hour and each gas jet 7200 cubic feet per hour, we have a total consumption of 54,000 cubic feet per hour. If, now, we have only allowed 1800 cubic feet for each gas jet and 1800 cubic feet for each person per hour, we would only have a total of 21,600 cubic feet, or a shortsge of 32,400 cubic feet. Allowing the air in the house to be perfectly pure when the gas was first lighted, by the end of the first hour we would still have a shortage of 12,400 cubic feet. In the above example the writer's opinion is that provision should be made for supplying 54,000 cubic feet of fresh air per hour.

Size of Vents.

Given the whole quantity of air necessary, the remaining question to be determined is the size of the outlet and inlet pipes. The velocity of the air movement in these pipes is, of course, the real key to the solution of the question. Where only natural forces are employed in moving the air, these velocities must vary according to the temperature of the air first, htght of vent shaft second, and amount of frictional resistance third. The greater the difference between the temperature of air in the vent shaft and the outside the greater the velocity, the higher the shaft the greater the velocity, and the more direct the connection between the room to be ventilated and the main shaft the less the loss of velocity by friction. In ordinary work this loss of velocity by friction is considerable, and while it is a very simple problem to determine what the velocity of the air in the vent pipes would be if it were not for this question of friction, with friction in the calculation it becomes more or less a question of guess work. Most authorities, however, seem to agree that this loss will average between one-third and one-fourth of the total volume of air which would pass through a certain sized opening if the loss by friction were not considered. Or in other words, after determining the initial volume of air, deduct one-third or one-fourth of this amount, and the remainder will be the actual volume of air passed.

Velocity Due to Temperature.

In determining the initial velocity of the air in a given shaft we must know, 1, the difference in temperature between the air in the shaft and the outside temperature, and 2, the hight of the shaft. In measuring the hight of the shaft measure from the lowest vent opening to the top of the shaft. With these quantities known, the question resolves itself to a simple calculation of the difference of specific gravity between the column of heated air in the shaft and a column of cold air on the outside. Air expands, when heated, one-four hundred and eightieth of its volume for each degree of Fahrenheit that the temperature is raised from 32° to 212°. If the air in the shaft is 30° warmer than the outside air, the volume of air in the shaft would be increased 30 times one-four hundred and eightieth, or thirty-four hundred and eightieths, or one-sixteenth. With a shaft 32 feet high the air would be expanded one sixteenth of 32 feet, or 2 feet; or, in other words, it would take a column of the heated air 34 feet high to balance a column of he external air 32 feet high. As it would be impossible to maintain this higher column of heated air so long as there was a free exit at the top of the shaft, the result would be a constant influx of air through the vent openings and a corresponding efflux from the top of the shaft.

The old saying that "water always seeks its level," is equally true of air. The colder, denser air will always displace the hotter, lighter air by reason of its greater weight or specific gravity. The velocity with which the outer air would rush into the shaft is determined by the velocity which a heavy body would acquire in falling through a space equal to the difference in the hight of the two columns of air. In

the above example we have the external column 30 feet, and the column in the shaft 32 feet, or a difference of 2 feet. The velocity of air in the shaft, therefore, would be equal to the velocity a heavy body would acquire in falling 2 feet. A heavy body falling freely through space will fall 16.1 feet in one second, while in two seconds, by the principle of accelerating forces, it will fall 64 4 feet; thus falling during the second second the difference between 64.4 feet and 16 1 feet, or 48.3 feet. The pulling force of gravity alone is equal to the distance a body will fall in one second, which is 16.1 feet; deducting this from 48.3 feet we have 32.2 feet, the initial velocity during the second second. It is this initial velocity we wish to ascertain to determine the velocity of the air in the shaft in the above example.

Table of Velocities.

The rule for this calculation is as follows: Multiply the difference between the hight of the heated column and the hight of the external air by 64, and the square root of the product will be the initial velocity of the air. In the example above the difference between the hight of the two columns is 2 feet. The example would resolve itself thus, $\sqrt{2 \times 64} = 11.31$, the initial velocity of the air in the above shaft in feet per second. Deducting the loss caused by friction, which is estimated at one-quarter, we have an actual velocity in round numbers of 8 feet per second, or 480 feet per minute, for each square foot of area in the shaft.

From the above we can easily deduce the following table:

Hight of vent shaft in feet.	Excess temperature of air in shaft over external air.											
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
10...	116	164	201	233	260	284	307	328	348	367	385	402
20...	164	232	285	330	368	404	434	465	492	519	545	568
30...	201	284	347	403	450	493	531	568	603	634	666	796
40...	235	329	403	465	518	570	614	656	696	734	769	804
50...	260	367	450	518	579	635	686	734	778	820	861	899
60...	284	402	492	568	632	696	751	804	853	900	943	985

In making the above table I have taken no account of the wind pressure, which, of course, in all calculations should have somewhat of a bearing. A high wind blowing over the top of a shaft will naturally accelerate the velocity, while a heavy cloudy day will have just the opposite effect.

These calculations are based on the movement of the air in the shaft, and independent of outside influences.

In determining the size of the fresh air inlets the question of leakage should be taken into consideration. While there is an evident effort on the part of all builders to make houses practically air-tight, it seems to be almost a physical impossibility to do so. In the opinion of the writer this leakage will vary all the way from 15 to 30 per cent. of the total volume of fresh air required. It is a very easy matter to determine which one of these percentages would be applicable to any given building by carefully examining the doors, windows and other outside openings, and the general construction of the building itself. Where the question of heating through indirect or hot air registers is taken into consideration, the inlet or hot air registers should be fully as large, if not larger, than the outlet registers. By having the inlet registers larger than the outlet we are thus able to put an air pressure in the room heated and ventilated, and thus avoid any possibility of drafts.

NOTE —Authorities consulted in making up the tables and calculations in this article are "Hood on Hot Water Heating," "Encyclopedia Brittanica," and current articles in the various scientific magazines.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

GEORGE H. MARSH, Spencer, Mass., was awarded the contract for the steam fitting at W. A. Barr & Son's shop, which is expected to be ready for business about January 15.

PLUMBER J. H. ALVORD, Winsted, Conn., has the contract for heating the Gillette House on Case Park.

J. B. FARNSWORTH, Leominster, Mass., has been engaged to furnish the plumbing for the new dormitory and academy buildings in South Lancaster.

WE LEARN from the New Haven *Record* that Langdon & Daly, North Main street, Hartford, Conn., have the contracts to do the hot water heating, plumbing and gas fitting in the elegant new residence of Horace J. Wickham of Manchester, also the hot water heating, plumbing and gas fitting of C. A. Ensign's mansion, at Tariffville.

D. E CROUCH has the contract for building a house on West Main street, Norwich, Conn., for Frank L. Lathrop. Tompkins & Murphy are doing the plumbing.

ROBERT BROWN, Norwich, Conn., is fitting up a new bathroom in W. N. Blackstone's residence on Washington street. He has also just finished a fine piece of plumbing in C. S. Johnson's house on Washington street.

ALBERT A. PECK and Daniel E Crouch are erecting residences at Norwich, Conn., that will have a plumbing system and will be heated with Winchester boilers.

A NEW PAROCHIAL RESIDENCE will be erected for the Rev. P. Fox in Newtown, Conn. A copper lined water tank will be placed in the attic and a plumbing system will be put in. The house will be heated by hot water.

ARCHITECT JACKSON has awarded the contract for the heating and ventilating of the St. Bernard's Parochial School, at Rockville, Conn., to the Underhill Warming & Ventilating Company of Boston.

THE SOUTHERN HEATING COMPANY, Louisville, Ky., are installing new hot water systems in both the Y. M. C. A. and Y. M. H. A. gymnasiums, for making hot water for bath purposes.

THE JOHN DAVIS COMPANY, 69–79 Michigan street, Chicago, are to install a steam heating plant in the building of E. S. Pike, 79–81 Fifth avenue.

THE BAKER & SMITH COMPANY, 193–197 Van Buren street, Chicago, have the contract for steam heating in the new building at 194–196 same street.

CONLON & MONTGOMERY, 33 Dearborn street, Chicago, have contracts for steam heating in the large apartment building at Jackson and Lytle streets, and in the residence of Thomas Engel, Evergreen avenue.

THE SAMUEL I. POPE COMPANY, 237 Fifth avenue, Chicago, are to install a heating and power plant in the building of Durand & Casper, West Lake and Union streets.

F. B TRIPP of Cottage City, Mass., has received a contract for the warming and ventilation of the new eight-room school building at that place. The plans and specifications presented by Mr. Tripp were prepared by James A. Harding, formerly with the Boynton Furnace Company of New York.

MONTGOMERY & PATTISON, 258 West Eighteenth street, New York, have the contract for plumbing a double set of officers' quarters on Governor's Island, the plumbing in the Ninth Regiment Armory, and some apartment houses on 165 h and 71st streets.

AT A RECENT TOWN MEETING in Millis, Mass., the town voted $5000 for a heating apparatus in the Adams School Building.

THE COMMITTEE ON BUILDINGS of the city of Jackson, Mich., will advertise for bids for the extension of the steam heating system throughout the county buildings. The expense is limited to $1200.

THE CHARLES H. SIMMONS COMPANY, 72–74 Market street, Chicago, have the contract for steam heating in the residence of MRS. L. B. Vincent, Grand boulevard and Forty-first street.

T. C. BOYD, 38 Dearborn street, Chicago, reports the following contracts for plumbing, gas fitting and sewerage: Morgan Flat Building, Dearborn street and Archer avenue, Thomas Hawkes architect; residence of D. W. Potter, 46 Drexel boulevard, F. W. Perkins architect; building of Durand & Casper, 163–167 West Lake street, S. W. Randolph architect; also remodeling the plumbing in the old and completing the plumbing in the new factory of Norton Bros., Maywood, Ill., F. R. Schock architect.

JONES & JAEGER, 80 Greenwich avenue, New York, are using an Electric steam boiler in heating a large saloon and restaurant in Jersey City, N. J.

CHAS. W. GRAVES, 62 North Clark street, Chicago, is to install a Florida steam boiler in the residence of J. Rosberg, Humbolt boulevard and Western avenue.

E. BAGGOT, 169–171 Adams street, Chicago, has the contract for the plumbing, gas fitting and sewerage in the apartment building of John R Hoxie, Michigan avenue and Forty-fifth street.

METZ BROTHERS, 107 Twenty-second street, Chicago, have the contract for combination heating in the residence of Dr. V. A. Pierce, Sixtieth street and Princeton avenue.

PURVES & BROCKWAY, 215 Fifth avenue, Chicago, are to install a steam heating plant in the residence of C. M. Bickford, Rogers Park, Ill.

JACOB G. WEBER, 244 North Clark street, Chicago, has the contract for the plumbing, gas fitting and sewerage in the flat building of Frank Rose, Oakdale avenue.

ALBERT A. CRYER & Co., 85 Centre street, New York, are installing two Richmond sectional boilers with 1600 feet of direct and 1500 feet of indirect radiation in the residence of J. A. Minott, at Orange, N. J., and intend to make this a model heating plant.

THE SCHOOL BOARD of Pittston, Pa., have awarded the contract for heating the Butler Hill School to John Scrimgeour for $800, and for heating High School No. 3 to Gorman & English for $867.

THE RETAIL STORE.

Round Loaf Baking Pan.

The accompanying cuts represent a round loaf baking pan, offered by Silver & Co., 304–310 Hewes street, Brooklyn, and 20 Warren street, New York. The pan is covered, and is designed to bake two round loaves of bread, 12 inches long and 4½ inches in diameter. It is stated that by the use of the pan bread will be baked evenly all through, that it will have a brown crust formed all over the surface, and that the bread will not crumble or break apart. The point is made that the bread, besides being pleasing in appearance, is baked right for making sandwiches, egg toast, Italian fritters, &c. The pan is made in Tin, X quality and Luster steel quality, in one size.



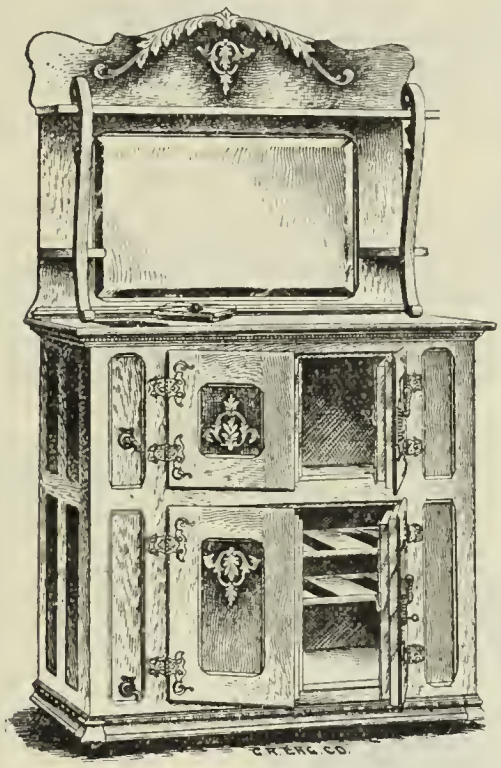
Fig. 1.—Round Loaf Baking Pan.



Fig. 2.—Round Loaf Baking Pan Open.

Dining Room Refrigerator.

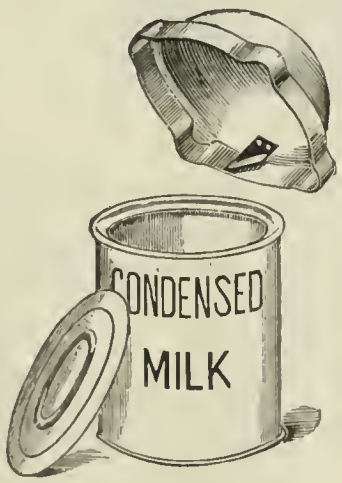
An illustration is presented herewith of a refrigerator of new design, intended specially for dining room use, which has been brought out by the Grand Rapids Refrigerator Company of Grand Rapids, Mich. This refrigerator is elegantly carved and has a porcelain lined water cooler for drinking water, which opens on the top of the sideboard. As it has no connection with the interior of the refrigerator, the drinking water cannot be tainted by the smell of the food, but is always pure and cold. Another porcelain lined tank is placed in the provision chamber to receive the meltings from the ice. This avoids the using of a waste pan and furnishes soft water at any time through the faucet. The refrigerator is further supplied with all the special features which have made the Leonard cleanable refrigerators so popular. It is made in solid oak, highly polished, in three sizes, namely, Nos. 32½, 33½ and 34½. The last named size is 44 inches wide, 22½ inches deep and 76½ inches high.



Dining Room Refrigerator.

Eclipse Can Opener and Cover.

Brooklyn Novelty Company, 1055 Madison street, Brooklyn, are placing on the market the Eclipse can opener and cover, for removing the tops of condensed milk cans, as here shown.



Eclipse Can Opener and Cover.

It is then utilized as a cover until the contents have been used. The device is struck up from sheet brass and then nickled. On the inside of the dome is securely riveted a tool steel cutter, which is forced through the thin top of the can. The opener is then revolved until the top is cut out, the four projections in the run giving sufficient purchase or hold to do this. John T. Ryan, 96 Chambers street, New York, is the selling agent in this city.

Dietz Tubular Mill Lantern.

The accompanying illustration represents a tubular mill lantern being introduced by R. E. Dietz Company, 60 Laight street, New York. The burner is locked in place by two positive locks on the globe frame, which work automatically. In addition to this a padlock may be used to lock the globe frame to the guard frame, thus preventing the watchman lifting the globe to light his pipe, or for other purposes. The guard has the company's wind break to prevent access to the flame over the top of the globe. The guard, it is stated, is extra strong, well made, and that it is locked in position by an automatic spring. It is explained that the base of the lantern is given extra strength, and that it is locked permanently to the frame by the use of side braces, holding them firmly together, independent of solder, a feature, it is remarked, peculiar to these lanterns. The manufacturers claim that the lantern is substantially made in every respect; that the solid drawn retinned oil fount holds 1¼ pints of oil; that the lantern will burn 19 hours without refilling; that the combustion is perfect; that it burns with a clear white flame, giving a brilliant light, and that the oil never heats.



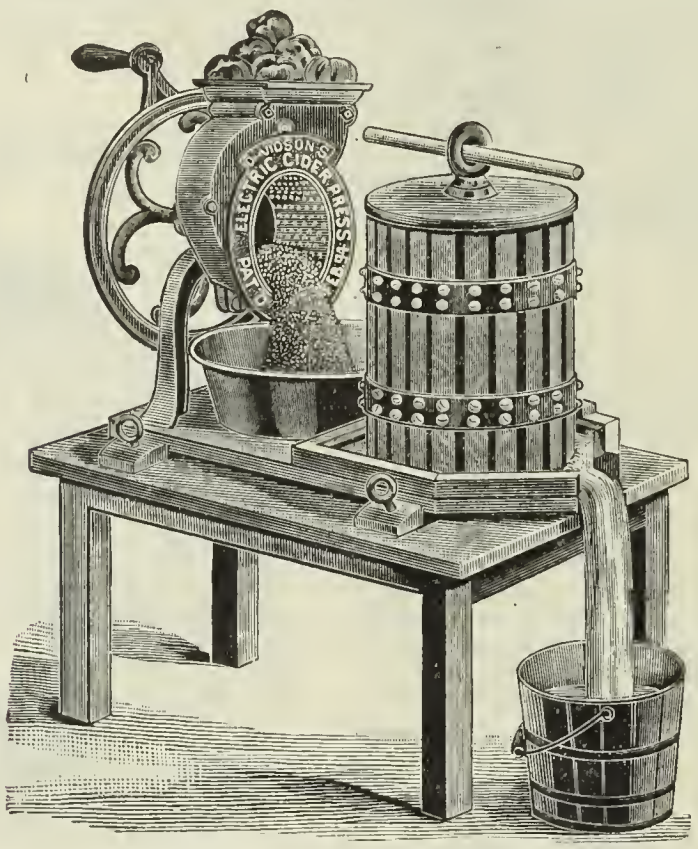
Dietz Tubular Mill Lantern.

THE FIRM of Buell & Farr, Earlsville, N. Y., was dissolved by mutual consent December 10. After that date F. C.

Buell took the hardware department and L. W. Farr the shop at the same place.

Davidson's Electric Cider Press.

O. E. Davidson & Co., Nashville, Tenn., are introducing a cider press, as here shown. The cutter is made of tinned steel, which, it is stated, will not wear except from rust, and will not rust if cleaned and kept in a dry place, while the board and crate are of well seasoned hardwood. The castings are of gray iron covered with water proof varnish to prevent rust, and the other metal parts are of wrought iron. It is explained that the press cuts and peels the apples, separating the good from the bad; a feature, it is remarked, that is not essential in making cider, but in preparing fruit for cooking purposes is very convenient. It is further explained that the danger of the cider becoming blackened by metal rollers and hoppers is obviated by the construction of the cutter, which carries off the cut apple before it touches any part of the hopper or other metal from which it might be stained. It is pointed out that as the press is small and convenient to carry, it is not likely to be left in the orchard to rust or to rot, as may be the case with larger presses. The manufacturers state that the press is small, light, strong and

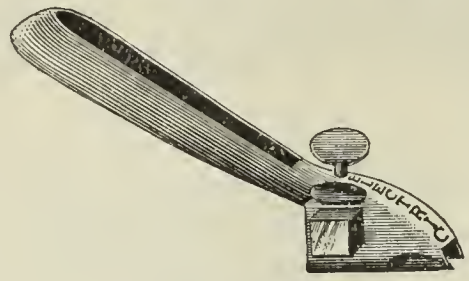


Davidson's Electric Cider Press.

low in price, and that while not designed to make cider for wholesale or in large quantities, it will be found sufficiently large for family use and well adapted to that purpose.

B. & W. Skate Sharpener.

George M. Matteson, 111 Duane street, New York, as sole selling agent for Banker & White, is introducing the skate sharpener herewith shown. The sharpener is 4½ inches long, made of malleable iron, full nickel plated, with a square file held in place by a thumb screw. It is explained that the principle upon which the sharpener works is that of draw filing, and that by its use the dullest pair of skates can be sharpened in five minutes by any child old enough to skate. In use the side of the sharpener forms a right angle with the file, to make it impossible to file anything but a true plane on



B. & W. Skate Sharpener.

the skate, or to round the edges. The point is made that as the file wears it can be moved its full length on four sides, thus giving a large amount of filing surface.

MEMORANDA.

George B. Blizard, 108-110 Marion street, Philadelphia, distributes a very pretty calendar to his friends and customers. The illustration is a domestic scene from bird life, printed in colors. Mr. Blizard repairs and installs heaters and ranges, besides doing tin and sheet metal work of all kinds.

"The Jewett refrigerators, class 'A A' Special," is the title of a very handsome publication for which we are indebted to the John C. Jewett Mfg. Company, Buffalo, N. Y. It is a pamphlet 10½ x 8 inches, containing 55 pages and bound in a rough paper with the title in raised red letters. In the beginning is a brief account of the Jewett refrigerators, telling of their different styles and of their merits. Then follow 50 pages containing cuts of a great variety of styles of the Jewett "A A" refrigerators. The cuts are made from artistic sketches and each refrigerator is illustrated with a perspective view, plan and a cross section and often other views, such as transverse sections and different elevations. For the regular stock refrigerators Class A, the trade are referred to the company's annual illustrated catalogue or small refrigerator book. This second publication shows the latter style in various forms, the class of illustrations there likewise being artistic drawings, and in connection with the engravings are given price-lists and dimensions and particulars of each refrigerator.

Stover Mfg. Company, Freeport, Ill., are offering a cover lifter which is referred to as being made of the best quality of gray iron and Bessemer steel, with a spiral coil handle to render the lifter always cool. The manufacturers claim for it every advantage of the more expensive lifters, and also special advantages in its construction which enable them to sell at much lower prices than other lifters of the same class. They are finished in copper and nickel plate, and are packed one dozen in a pasteboard box, and one gross in a case.

The Wagner Mfg. Company of Sidney, Ohio, makers of the Wagner cast iron hollow ware and cast aluminum ware, are distributing to their friends a very neat calendar for the year 1895. The central feature of the design represents a healthy looking small boy who has lost a shoe and is fast losing his socks, standing upon an overturned wash pan and holding in his extended left hand a Wagner kettle, while a yellow cat occupies a conspicuous place in the background. The leaves forming the calendar proper are attached to the lower right hand corner of the card. In addition to the figures for the days of the week and month there is also a yearly calendar and an indication of the various phases of the moon. Advertising matter extends across the top of the card, while in the left hand corner is a *fac-simile* of the company's trade mark.

The Geuder & Paeschke Mfg. Company, manufacturers of tinware, &c., Milwaukee, Wis., report that they are making preparations for a vigorous campaign in 1895. The tariff agitation having been practically settled for the next few years at least, they believe that business men generally will be justified in expecting a conservative increase on sales, and that in consequence there will be much heavier demands made on manufacturers than have been experienced for some time. The Geuder & Paeschke Mfg. Company, who are in position to give prompt attention to all orders intrusted to them, extend a cordial invitation to the trade at large to avail themselves of their facilities whenever in need of goods in their line.

H. W. Gazlay, 138 Groton avenue, Cortland, N. Y., distributes circulars illustrating and briefly describing the Model milk cooler and aerator of his manufacture. The rapidity with which the device will cool milk and aerate it are alluded to in the account, as well as the advantageous features of the apparatus. The Model cooler is made of IXX tin plate, with galvanized iron bottom. The circular presents letters from many sources testifying to the merits of the cooler.

A calendar for the new year, for which we are indebted to D. H. Cassel, East Bucyrus street, Crestline, Ohio, is one of the serviceable sort that will be appreciated by the trade. It is mounted on a green back, and the sheets of the calendar are large enough to present the days in big type that can be plainly read at a distance. The moon's phases are a feature of the calendar. Mr. Cassel is a dealer in hardware and stoves and a manufacturer of copper, tin and sheet iron ware.

STOVE TRADE NOTES.

Ohio and Indiana Stove Trade.

A few manufacturers throughout Ohio and Indiana are still in the throes of stock-taking, but most of them have completed, or nearly so, their balance sheets, showing the result of the year's business. Returns from Indiana are uniformly encouraging, and reports throughout Ohio, while varying in some respects, may be taken as a fair indication that there has been decided improvement throughout the year, although some foundries find they have fallen below the standard of '92, and in some instances even below the record of '93. When it is remembered that most of the conditions having an influence upon the market were discouraging to the utmost during the first half of the year, it is not surprising that the past six months have not wholly made up the deficiency to the majority; yet in not a few instances has this been the case, so that, taken all in all, the outlook is one of confidence, although it is yet too early, nor is it the season, for reports of increased sales.

One prominent manufacturer, summing up the situation from his own experience and from information gathered from others, reports that there has been an average shrinkage of sales of about 20 per cent. compared with 1893. Profits have suffered, from his standpoint, first from reduced sales and increased cost of manufacture due to decreased production, and second because of the higher cost of production arising from the improved and higher standard necessary to maintain by the general demand and through active competition, to cover which there has not been a corresponding increase in the selling price. But while prices have not advanced, they have remained steady. It would seem that the lower prices prevailing for raw material may have contributed something toward this end, thus benefiting the foundries, and, in some instances, at least, a lower scale of wages has prevailed. Other dealers, however, report that balance sheets show them that sales were about 8 per cent. more during 1894 than in 1892, and 20 per cent. more than in 1893, and one manufacturer writes that their sales during 1894 were almost double those of 1893.

Many foundries which closed down for the holidays and stock-taking have resumed, some with full heats and full handed.

There is a fair run of small orders throughout, but no large contracts, and we do not hear that large stocks of any kind were carried over, but this is due probably to the conservatism which characterized trade throughout the entire year.

The prospects for '95 seem to be regarded as good, and manufacturers urge that a spirit of conciliation be exercised by all to the end that rate cutting may not disturb the outlook.

James S. Bailey.

James S. Bailey, president of the Tuttle & Bailey Mfg. Company, New York, Chicago and Boston, died on Sunday, January 6, at his home, 176 Harrison street, Brooklyn, of cerebral thrombosis, after an illness of about six weeks. He was born at Lebanon, Conn., December 9, 1817, and was descended from an English family who settled in Newburyport, Mass., in 1638. Mr. Bailey went in 1836 to New Haven, where he was engaged in business for a number of years. In 1847 he came to New York City, and in the following year went into partnership with C. F. Tuttle in the manufacture of registers, ventilators, &c. In 1866 the concern was incorporated as the Tuttle & Bailey Mfg. Company, well known as one of the leading houses in their line in this country. Mr. Bailey was president of the company from the time of their formation. He was a man of marked business capacity and very high character, and was noted among his associates for wisdom in council and for his absolute integrity. In private life his amiability of disposition and sympathetic nature endeared him to a wide circle of personal friends. He was warmly in sympathy with every movement for the amelioration of humanity, and was interested in a number of philanthropic and religious undertakings, in connection with which his loss will be severely felt. He was a member of the Chamber of Commerce of New York City, was a trustee of the South Brooklyn Savings Institution and had been for a long period associated with the Central Congregational Church of Brooklyn, of the Board of Trustees of which he was for many years the president. Mr. Bailey was married in 1843 to Augusta C. Trowbridge, daughter of Capt. Roswell Trowbridge of New Haven, Conn. The celebration of their golden wedding, on July 25, 1893, was attended by a large gathering of their children and grandchildren. Six children were born to them, of whom five are still living, two sons being connected with the Tuttle & Bailey Mfg. Company. The funeral was held on Wednesday and attended by a large circle of personal friends and business associates. The interment took place at New Haven, Conn., the following day.

E. D. PURVES will continue to look after the interests of Southard, Robertson & Co., 257 Water street, New York, in Pennsylvania, Delaware, New Jersey and the South during 1895. Their line of stoves and ranges have become leaders with many dealers in the territory mentioned.

The Coldwater Oil Stove Company.

Important improvements are now being made at Coldwater, Mich., in the plant of the Coldwater Oil Stove Company. This company began business in a modest way not long since, under the very efficient management of B. S. Tibbits. The plant known locally as the Titus Foundry was utilized for manufacturing, but the business has grown so rapidly that larger facilities have for some time been urgently needed. It has therefore been decided to erect new buildings, which are to be specially adapted to the purpose, and will be placed in a more convenient locality. One of these buildings will be 60 x 200 and the other will be 60 x 66 feet. They will be pushed to completion as rapidly as possible, and will be equipped with the most improved machinery and latest appliances for manufacturing every part of the different kinds of stoves which the company will place on the market.

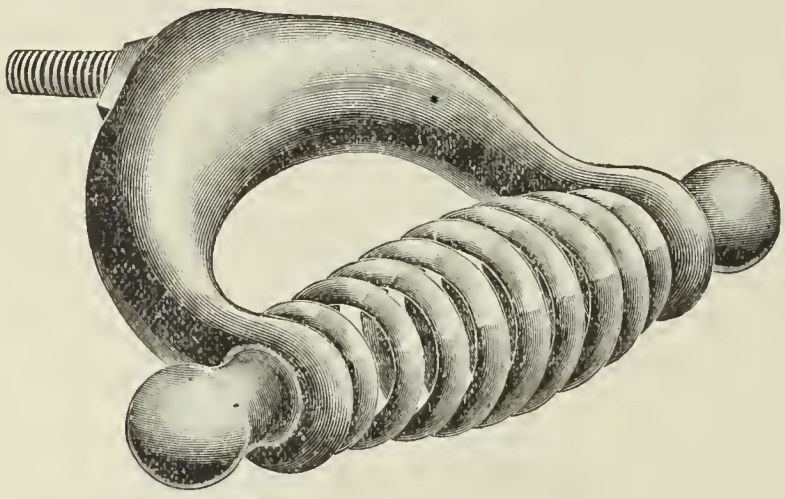
The company have thus far made and won their reputation on the All Right and Sunbeam oil heaters, which have found their way all over the United States. The success thus achieved has inspired Mr. Tibbits to extend the business so as to embrace other related lines. When the new plant is finished he will also make oil cooking stoves of several styles, somewhat on the plan of gasoline stoves, with two or three or more burners, but consuming oil instead of gasoline. He will further make a wood burning stove and range to meet the demand for an article of this character which will combine low cost with beauty, utility and economy of fuel. It is pleasant to note the evidence of prosperity which is thus presented.

HARTER & COSLEY, Troy, Ohio, who are agents for the Charter Oak stoves and ranges manufactured by the Excelsior Mfg. Company, St. Louis, are at present congratulating themselves on the outcome of a contest which was recently inaugurated by them. Early in December Harter & Cosley offered valuable prizes to the boys and girls of Troy who would enter a spelling contest. The words selected for the boys were "Harter & Cosley, Hardware," and the boy sending in the largest list of correctly spelled words composed of letters used in the above would receive a tricycle, while the sender of the second largest list would receive either a pair of skates or a sled. The girls' prizes consisted of a miniature Charter Oak stove as the first prize, and a pair of skates as the second prize, while the words selected for them to compose from were "Charter Oak Stoves." The contest created interest for weeks preceding Christmas, and on that day the prizes were delivered. On Christmas afternoon the store of Harter & Cosley was crowded clean out to the pavement. A band of music was present and the distribution of the prizes began. Miss Amy Allen secured the first girls' prize with 1350 words, while Miss Harriet Mitch was a close second with 1339 words. The boys' prizes were secured

by J. Morris Coombs with 3762 words, and Glen McConnell won the second prize with 3745 words. There were in all 206 competitors, and the enterprising merchants distributed to each and every one a bag containing oranges, candy and nuts, and a pearl handled pocket knife. While the labor incident to a contest of this kind is very considerable, yet the results obtained in this case were such that the labor expended was more than repaid. The Excelsior Mfg. Company are to be congratulated on having such wideawake and enterprising agents.

New Alaska Stove Door Handles.

The Troy Nickel Works of Troy, N. Y., have recently added to their already extensive assortment of Alaska goods a number of new designs of handles for this year's trade. We present in the accompanying illustrations two of the many styles which the company are offering, one being severely plain in its treatment, while the other represents a form more elaborate in construction. The handles are made of cast iron, with that portion that comes in contact with the hand constructed of Bessemer steel wire, the whole being heavily nickel plated. The merit of Alaska goods is that they are always cool to the touch and the housewife or domestic runs no danger of burning her hands when opening a stove door fitted with one of these handles. The assortment which the Troy Nickel Works are offering the trade this year is a varied one and includes designs adapted to meet all reasonable requirements.



New Alaska Stove Door Handles.—Fig. 1.—General View of a Plain Handle.

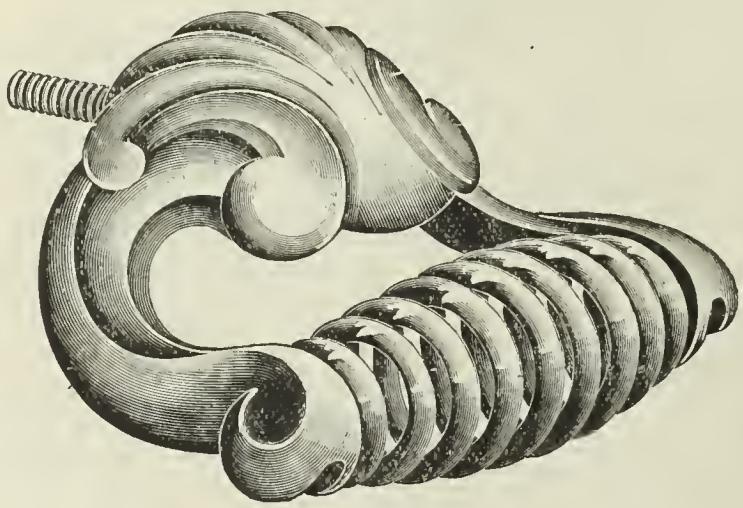


Fig. 2.—Handle of More Elaborate Design.

ODD PLATES.

THE BLOOM ROTARY OVEN COMPANY have been incorporated at Burlington, Mo., by John Cook, A. Sciel and S. Black, with a capital stock of $21,000.

HOLLY, MASON, MARKS & Co. of Spokane, Wash., have begun the manufacture of a sheet iron heater named the Queen. A local paper notes the remarkable fact that out of the first output of the factory an order was filled from New Bedford, Mass., and another from San Francisco, Cal.

THE MICHIGAN VAPOR STOVE COMPANY of Grand Rapids, Mich., are now settled in their new home. The work of removing from the old location required several weeks' time. The new building is located at 14 to 18 Mill street, with the rear on the bank of the Grand River. It is a brick four-story and basement structure, with dimensions of 50 x 100 feet, and an addition in the rear 16 x 100 feet. A separate building for japanning, 36 x 46 feet, has been erected at a distance of 25 feet from the main building. The basement of the main building is used as a press room, containing four presses, the largest of which is capable of taking a 21 x 39 inch stove top and then allowing 2 inches leeway. This machine was built by the E. W. Bliss Company and weighs 12 tons. This room also contains a planer built by the G. A. Gray Company of Cincinnati, 36 inches by 8 feet. The engine and boiler room are also in the basement. Power is supplied by a 90 horse-power engine and a 90 horse-power water wheel. On the first floor are the office and shipping room, tool room and machine room. The second floor is used as an assembling and mounting room, pattern and crating room and also has the testing room, which is 16 x 24 feet and is lined with sheet iron. The third and fourth floors are devoted to storage purposes, being used for storing stoves ready for the market. The company are now making 27 styles of stoves, including a full line of juniors, both high and low, and with single generators and individual burners. A notice of their line of stoves would not be complete without a reference to the jet cone burner, which is their distinctive specialty and is a feature of all the higher grade stoves. The company are not a corporation but a co partnership, of which F. A. Stone is manager and B. P. Kenyon superintendent. With a fine equipment and ample capital, this company will be an important factor in the vapor stove trade.

H. N. REYNOLDS, secretary and treasurer of the Craig Reynolds Foundry Company, Dayton, Ohio, was a recent visitor at the office of *The Metal Worker*, and is exceedingly enthusiastic over the outlook for the sale of the Triumph line of heaters and furnaces this company are producing the present year. Mr. Reynolds is an indefatigable worker and is largely responsible for the rapidity with which this company's productions have become so well and favorably known.

THE PERRY STOVE COMPANY, 242 Water street, New York, are already making preparations for the summer trade. They have secured the agency for the sale of the Aurora gasoline goods, and will soon bring out two new lines of gas hot plates. A. J. Kirkland has been engaged by the company to visit the trade in New York City and on Long Island.

DAVID MILLAR has made an engagement with the Fuller & Warren Company of Troy, N. Y., to represent them in New York and vicinity. He will have an office at 236 Water street, and will visit the trade in the interests of the F. & W. stoves, ranges, furnaces and steam and hot water goods.

THE Craig Reynolds Foundry Company, Dayton, Ohio. manufacturers of the Triumph line of furnaces and heating apparatus, are rapidly extending their line of agencies; among the more recent being that of the Pittsburgh Heating & Supply Company, 100 Wood street. Pittsburgh, Pa. This concern have been reorganized with ample capital, and will have exclusive control of sales within a territory covering 100 miles radius from Pittsburgh. The home company now have in active operation over a dozen first-class agencies for the sale of their productions, and are highly gratified with the reception their goods have met, as is evidenced by the numerous testimonials received daily. Six styles and 32 sizes, from the cheapest to the highest grade, warm air furnaces are now being marketed by them; in addition to which they are producing two styles and ten sizes of combination heaters. A handsome catalogue full of valuable and practical information is now on the press, which will be ready for distribution February 1, 1895.

THE CHEAP FUEL PROBLEM for the fuelless prairies of the Northwest, says a Western paper, was settled by the Maker of the earth before humanity raised the question of a problem. There is now hardly a portion of the settled prairie country of the Northwest that is not blessed with an outcropping vein of

lignite coal, and where this fuel can be easily reached by rail or wagon road the farmers that were wont a few winters since to spend the cold season twisting marsh hay for fuel are now burning this lignite, and enjoying coal fires with less expense than many of the citizens of Eastern States. This winter farmers are hauling into Bismarck by wagon this coal, taken from exhaustless veins a few miles north of the city. They sell the coal in the city at $2.50 per ton, which they buy at the mine for 90 cents. This coal is sold at most of the Dakota cities at from $2 to $3 per ton. Two and a half tons are worth 1 ton of the best anthracite, which would cost from $8 to $11 per ton.

THE REPUTATION of the goods manufactured by the Portsmouth Stove & Range Company of Portsmouth, Ohio, is not confined to this country alone, but has spread abroad among foreign nations. The company have lately received a letter from Thalmyl, Switzerland, asking prices on their ranges delivered at Antwerp, and feel that after the goods are once introduced into that section of the world large sales will result.

DE HAVEN & COMPANY Limited, Pittsburgh, Pa., have brought out a new line of Cinderella Kitcheners which are reported as being an entirely new series of all cast iron ranges, and adapted for burning hard or soft coal or wood. The ranges are referred to as having embodied in their construction many new and desirable features. They are made with feet and skirting in lieu of the low closet, and they also have a full complement of high shelves and high closets. The reservoir is made of planished copper and holds 15 gallons of water.

THE LAURA NEVINS RANGE & HEATING COMPANY, Minneapolis, Minn., recently issued a very neat Christmas greeting in the shape of an oblong pamphlet dedicated to the "friends, admirers and patrons of the famous Laura Nevins ranges." The little pamphlet is presented with the compliments of J. H. Nevins and contains a history of the Laura Nevins ranges from their inception to the present time. A portion of the pamphlet is devoted to testimonial letters from some of those who have used the goods named.

A FEW DAYS AGO we received a cordial note from the Troy Nickel Works, Troy, N. Y., and after referring to the gratifying relations that have existed between us during the past year, they mention that they have taken the liberty of sending us a New Year's gift of a diamond pin. At least that is the way we read the letter, and we waited with not a little interest the coming of the present. A little package was duly received a day or two later, and was opened with no small degree of anticipation and curiosity. Exactly what this diamond pin was need not be told here. It was an article of considerable intrinsic value and was not a bit of paste or molded glass which we had expected to find. We cannot promise that every one will receive one of these gifts on application, but it would be worth while inquiring about them to merely satisfy one's curiosity.

F. V. KNAUSS of the Portsmouth Stove & Range Company, Portsmouth, Ohio, has been experimenting for some time past with a view to securing the complete combustion of fuel in a heating stove. The knowledge that no substance containing water can be heated beyond the temperature of the water within it, has been utilized by Mr. Knauss in making the parts of a heating stove exposed to the direct action of the fire hollow and keeping them filled with water. The water is constantly changed through a system of circulation and the arrangement is such that by means of radiators a number of rooms may be heated. The experiments were made with an old Denmark retort stove taken from the scrap pile, and the results are said to have been very satisfactory. We understand that Mr. Knauss has patented his invention and will apply it to the construction of heating stoves.

THE CENTRAL OILGAS STOVE COMPANY announce to their friends in the trade that a new catalogue for 1895 will be ready for distribution within a few weeks. The company have very carefully studied the requirements of the trade, and feel that the lines they will offer are complete in all respects. They will place on the market specialties in new goods which, by reason of their many attractive and desirable features, as well as the prices at which they will be offered, cannot fail to commend themselves to the attention of dealers generally. In addition to their popular Oilgas cook stoves containing improved burners for 1895, the company have something entirely new in the way of lamp stoves at special prices, and also sheet steel circular burner oil cook stoves.

H. WATERMAN, manager of the New York office, at 109 Beekman street, of the Cleveland Foundry Company, Cleveland, Ohio, has been in Philadelphia in the interest of their line of Puritan gas and oil heating and cooking stoves.

THE DIGHTON FURNACE COMPANY of North Dighton, Mass., are distributing with their compliments a very pretty calendar in the shape of a poster bound with metal strips, and provided with a metal eye for hanging it upon the wall. The design, which occupies the greater portion of the poster, consists of the picture of a beautiful child, the printing being in colors which harmonize much better than is usually the case with lithographs. Across the top of the poster is the name and address of the company, while at the bottom are 12 small leaves carrying a calendar for the months of the year. There is given in addition to the days of the week and month the various phases of the moon.

THE CALENDAR sent out by Roberts, Winner & Co., Quakertown, Pa., is an amusing card appropriate to the season. The decoration is an arctic scene with several polar bears skating about a field of ice. If the stoves, ranges and Alaska furnaces are suitable to the condition of the climate represented in the picture they are undoubtedly most efficient apparatus. The calendar proper is attached to sheets at one side of the card.

SINCE the Meyer Furnace Company of Peoria, Ill., purchased from the Weir Furnace Company of Des Moines, Iowa, the right to manufacture and sell the Weir soot and gas burning steel furnace in the State of Illinois, they have turned out 300 of these constructions in order to supply the demand from consumers in the State named. The Weir Furnace Company have lately completed arrangements with the Anshutz-Bradberry Company of Pittsburgh, Pa., whereby the latter concern will make the furnace and supply the trade in the States of Pennsylvania, Ohio and West Virginia. The Anshutz-Bradberry Company have about completed the patterns for the manufacture, and, we understand, will engage in the production on a large scale. They will call the heater the Tremont gas and soot consuming furnace, for which a large sale is expected. They state that as a starter they will place seven of them in the Eleventh Ward school house in Pittsburgh.

WE ARE INDEBTED to the Scranton Stove Works of Scranton, Pa., for a copy of the 1895 calendar which they are distributing with their compliments to friends in the trade. The 12 leaves for the calendar proper are attached to the lower portion of a piece of heavy cardboard, in the upper left hand corner of which is a bird's-eye view of the Dockash Stove Foundry. Another picture represents three lads, two of whom have dinner pails in their hands, while the third is holding aloft his miner's cap. From the humorous expression of their faces and their general attitude it is evident that they are posing before the camera. The boys are on their way to the coal breaker and mine represented in the background of the picture, and which is located to the right of the stove foundry shown in the upper left hand corner of the card. At the left of the picture is the statement that the Dockash Foundry was in continuous operation during the year 1894, and that "dealers securing the sale of Dockash stoves and ranges always lead the market in their respective towns." The printing of the pictures is in black, while the text is in red.

THE MARCH BROWNBACK STOVE COMPANY of Pottstown, Pa., issue an announcement relative to their heater department to the effect that in the Crown soft coal furnace the drum is self cleaning and all joints asbestos packed, the latter being water tight and therefore air tight. The construction is such that the products of combustion are made to come in contact with all parts of the radiator, thus giving a maximum radiation. The furnace has side draft, created by the fire pot being deeply ribbed on the inside. Attention is also invited to the Art Franklin grate, suitable for halls in dwellings, libraries, dining rooms, sitting rooms, bedrooms, &c. It is also arranged for heating rooms on the floor above. Circulars which the company have issued represent but a small portion of the many types of goods made, and the company suggest to dealers that if any part of them should not fully meet their requirements the company be advised in what respect the goods are wanting, so that they can forward circulars of other goods which will exactly meet their wishes.

JAMES DANIEL is one of the corps of salesmen who will advance the interests of the Acorn line of stoves and ranges for Rathbone, Sard & Co., Albany, N. Y., this year.

E. E. HORTON, one of the traveling salesmen of the Thatcher Furnace Company, 240 Water street, New York, has been making a few days' visit with the house previous to making one of his regular trips in the interest of the Thatcher furnaces and the Champion steam and hot water apparatus.

THE PECK-WILLIAMSON HEATING & VENTILATING COMPANY, with home office and factory at Cincinnati, Ohio, and branches in Chicago, Pittsburgh, Dayton and St. Louis, have been distributing to their friends in the trade

copies of what is known as Catalogue B. It is a volume of 80 pages, printed on good paper and neatly bound in heavy paper covers, embellished with embossed side title in old gold. The text is composed, for the most part, of testimonial letters from those who have used the company's goods. There are many illustrations, consisting of photo reproductions of buildings heated and ventilated by the company's system, the structures including public as well as private buildings, churches, &c. The latter part of the volume contains illustrations of the company's furnaces, together with descriptive particulars.

W. L. MERSFELDER, proprietor of the Cincinnati Pattern Works, Front and Lawrence streets, Cincinnati, Ohio, is distributing a very neat folder, neatly printed in colors and carrying on the front cover a handsome design embossed in old gold, bronze, red, white and green. In the upper left hand corner is the inscription, "Season 1895," and in the lower right hand corner, "A Short Tale Quickly Told." The inside pages of the folder are devoted to text relating to patterns made by the concern named. Attention is called to the artistic design of patterns which have been turned out for a number of years by means of a plant equipped with modern machinery and employing skilled labor. Reference is also made to the fact that they manufacture wood and iron patterns as well as follow boards, and furnish to order for approval designs and drawings. The folder is arranged with a silken cord with a pink tassel.

FLOYD, WELLS & Co. of Royersford, Pa., are the assignees of a patent granted last month to Isaac Brooke of Pottstown, Pa., for a hot air attachment for stoves. This attachment consists of a jacket which incloses the fire pot of the stove in such a way as to leave an air chamber between it and the fire pot. There is a depending portion of the jacket which, with the wall of the ash pit, forms an air supply nozzle. The lower portion of the jacket closes on the ash pit or base, while the upper portion is separated from the rim in such a way as to form a discharging passage. The arrangement of parts is such that air is directed to the exterior of the fire pot and then discharged from the air chamber in a highly heated condition.

THE DIRECTORS of the Central Stove Works of Lebanon, Pa., held a meeting last week for the purpose of arranging a programme for the new year. They decided, among other things, to increase the productive capacity of their plant in order to meet the rapidly growing demand for their goods.

THE TROY NICKEL WORKS of Troy, N. Y., are favoring their friends with neat little circulars calling attention to Alaska goods, which they are manufacturing in almost endless variety. Attention is specially directed to the Alaska tack hammer made of solid steel and full nickel plated, Alaska pokers, lifters, shovels and fire sets, and also to the Troy stove pipe damper.

THE PHILLIPS & CLARK STOVE COMPANY of Geneva and Troy, N. Y., are furnishing their friends in the trade with a calendar, diary and memorandum combined, it being of the same general style as that which they have issued for several years past. The card is in the shape of an easel for desk use, the lower portion carrying yearly calendars for 1895 and 1896. Over these calendars is fastened what is known as the "Daily Reminder," copyrighted by the Matthews-Northrup Company, Buffalo, N. Y. This, as stated above, is a calendar, diary and memorandum combined, its special use being to remind one of things to be done each day and serve the place of an office diary. In using it all the leaves but the last on the left side should be folded back to the right, and one leaf turned over every two weeks thereafter. At the end of the year the "Daily Reminder" can be preserved as a record of the engagements of the year. A cord is so arranged in connection with the card as to hold the diary open at any page desired.

Russel Wheeler.

Russel Wheeler, one of the best known citizens of Utica, N. Y., died at his home in that city on January 5, after a brief illness. He was born at Rome, N. Y., August 7, 1820. He obtained an education in the district school, and at the age of 18 years entered John Mair's hardware store, remaining four years. In 1842 he became bookkeeper for Joel C. Bailey, who had purchased the Dexter Foundry in Utica. He was admitted as partner two years later, the firm being Bailey, Wheeler & Co. The concern increased the quantity and quality of their products and won a high reputation. The first coal cooking stove manufactured west of Albany, N. Y., was made in the firm's factory on Columbia street. During the 21 years of the firm's continuance they secured numerous patents for improvements in the construction of stoves and laid the foundation for a large and lucrative business. In 1855 Mr. Wheeler bought out the senior partner, and ten years later secured the interest of S. Alonzo Bailey. After 12 years he admitted to partnership his son, Frank E. Wheeler. Two years later a share of the business was secured by Francis Kernan, Jr. The partnership continued until January 1, 1890, when Mr. Wheeler and his son purchased Mr. Kernan's interest and made the firm Russel Wheeler & Son. Mr. Wheeler had been identified with numerous local interests. In 1849-50 he served as Alderman. He was a director of the Oneida National Bank and the Savings Bank of Utica. For many years he was vice-president of the Utica City National Bank. He was a director in the Utica Steam Cotton Mills and Willovale Bleaching Works, and had been a director of the old Utica & Black River Railroad Company. He had served Colgate University many years as a member of its Board of Trustees. He was an extensive traveler and had made frequent trips through the West, where he had large property interests, and also abroad. He was twice married, and leaves a widow and son.

H. R. Ives & Co., Montreal, Canada, have lately completed successfully a rather remarkable piece of foundry work. They have made 440 large sections of pipe, 10 feet in diameter and 5 feet long, weighing between three and four tons each. Out of this large number there were only 17 defective ones from any cause whatever. These rings or pipe sections were used for culverts underneath the new Soulanges Canal, allowing two rivers to run beneath the canal.

The recent severe cold in this section provided a large ice crop on the Hudson and other rivers.

CONTENTS.

	PAGE.
Editorials:	
The Passing of the Depression	31
Employment of Labor	31
The Brightening Future	31
Politeness	31
Ventilation	31
Test of Fire Proof Material	32
The Quick Meal Tank for 1895. Illus	32
A National Convention of Manufacturers	32
Plumbing and Gas Fitting—	
Master Plumbers of New York	33
A Suburban Water Supply. Illus	33
Lead Burning Class	33
An Unventilated Vent. Illustrated	33
A Gas Water Heater. Illustrated	34
Maelstrom Siphon Closet. Illustrated	34
Patronizing the Plumber	34
Philadelphia Master Plumbers' Association	35
Traps and Vents	35
Steam and Hot Water—	
Steam and Hot Water Heating at the New York Trade School	36
Armstrong Pipe Threading and Cutting Off Machine No. 2½. Illustrated.	36
Circuit System of Hot Water Heating	36
Automatic Expansion Tank. Illus	37
A Heating Problem	37
Why We Vetilate	37
The Columbia Ceiling Plate. Illus	37
Heating Notes	38
Heating and Ventilating Engineers	38
The Letter Box—	
Questions in Steam Heating	39
Double Furnaces	40
Kerosene as a Wood Preservative	40
Choked Water Backs	40
Rusting of a Tin Roof	40
Base Burning Stoves	40
Tin Plates—	
Net Weight of Tin Plates	41
A New Tin Plate Plant	41
Scrap	41
Extra Heavy Gap Shear. Illustrated	42
Trade in Tinners' Tools	42
Roofing and Cornice—	
National Association of Iron Roofing Manufacturers	43
Eave Trough and Conductor Pipe Manufacturers	43
Sheet Metal Class at the Pratt Institute	44
The Roofing Trade in the West	44
Flashings	44
Ventilation	45
Heating and Plumbing—New Work and Contracts	46
The Retail Store—	
Round Loaf Baking Pan. Illustrated	47
Dining Room Refrigerator. Illus	47
Eclipse Can Opener and Cover. Illus	47
Dietz Tubular Mill Lantern. Illus	47
Davidson's Electric Cider Press. Illus.	48
B. & W. Skate Sharpener. Illustrated.	48
Memoranda	48
Stove Trade Notes—	
Ohio and Indiana Stove Trade	49
James S. Bailey	49
The Coldwater Oil Stove Company	49
New Alaska Stove Door Handles. Illus.	50
Odd Plates	50
Russel Wheeler	52
Trade Report—	
The Iron Market	53
Metal Market	53
Condition of the Hardware Trade	54
Notes on Prices	54
Revised Price-list of Radiators	57
Metal and Miscellaneous Prices	58
Labor Exchange—	
Help Wanted	60
Situations Wanted	60

TRADE REPORT.

The Iron Market.

Pig Iron.—As ragards to the New York market, makers of Standard Pennsylvania brands report a heavier movement, particularly in the lower grades. Some of the Pipe founders and puddling mills have contracted for considerable quantities. There is more inquiry for Foundry grades for delivery this year, and some transactions of this character have been closed. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

Philadelphia advices indicate that Foundry Irons are steady at last week's prices, but very inactive. Local furnaces are well sold up, and as freights are too high to permit of other Irons being sent there at less than quoted rates, new business is comparatively unimportant. Deliveries on old contracts are being taken with satisfactory promptness, so that furnaces are not accumulating stock to any great extent, but the question of prices for later deliveries is still to be settled. Ssles have been on a fairly liberal scale at about the old figures. General quotations for Philadelphia and equivalent points are about as follows:

Standard No. 1 Foundry X	$12.50	@	$13.00
Standard No. 2 FoundryX	11.50	@	11.75
No. 2 Plain	10.75	@	11.00
No. 1 Soft	11.50	@	11.75
No. 2 Soft	10.75	@	11.00

The trade in Local Coke Iron in the Chicago market shows no improvement over that reported last week. The demand is of moderate character, and inquiries have not increased. Sellers of Southern Coke Iron report a somewhat better inquiry in their line, but sales have been confined to small quantities. Lake Superior Charcoal is quiet. Quotations are as follows, for cash:

Lake Superior Charcoal	$13.00	@	$14.00
Local Coke Foundry, No. 1.	10.25	@	10.50
Local Coke Foundry. No. 2.	9.75	@	10.00
Local Coke Foundry No. 3.	9.50	@	9.75
Local Scotch	10.50	@	11.00
Ohio Strong Softeners No. 1	12.50	@	13.00
Southern Silvery, No. 1	11.50	@	11.75
Southern Silvery, No. 2	11.25	@	11.50
Southern Coke, No. 2	10.00	@	10.50
Southern Coke, No. 3	9.75	@	10.25
Southern, No. 1, Soft	10.00	@	10.50
Southern, No. 2, Soft	9.75	@	10.25
Alabama Car Wheel	17.50	@	18.00
Jackson County Silvery	15.50	@	16.00
Other Ohio Silvery	14.25	@	14.50

The past week in the Pittsburgh Pig Iron market is reported as having been extremely quiet, sales being nearly altogether for small lots. In Foundry Irons little is doing and prices are weak and lower. For delivery during the next three months quotations are given as follows for cash:

No. 1 Foundry	$10.50	@	$10.65
No. 2 Foundry	10.00	@	10.25

Sales of Pig Iron are reported as having increased rather than otherwise in the Cincinnati district, that is, the run of small orders has aggregated a larger tonnage, and one or two round lots have also been sold, but prices have been so low that the profits have been below the average of ordinary times. Pipe works continue to be the largest melters of Pig Iron in the district. Quotations are given as follows:

Southern Coke, No. 1	$9.75	@	$10.00
Southern Coke, No. 2	9.00	@	9.25
Southern Coke, No. 3	8.50	@	8.75
Ohio Soft Stone Coal, No. 1	14.50	@	15.00
Ohio Soft Stone Coal, No. 2	14.00	@	14.50
Lake Superior Coke, No. 1	11.75	@	12.25
Lake Superior Coke, No. 2	10.75	@	11.50
Hanging Rock Charcoal, No. 1	16.00	@	16.50
Hanging Rock Charcoal, No. 2	15.50	@	16.00
Tennessee Charcoal, No. 1	13.00	@	13.50
Tennessee Charcoal, No. 2	12.00	@	12.50
Bessemer	11.65	@	12.00
Standard Southern Car Wheel	15.75	@	16.75
Lake Superior Car Wheel and Malleable	14.25	@	14.75

A number of inquiries for Pig Iron are noted in the St. Louis market, which will, it is thought, lead to business later on. No. 2 Foundry is quoted at $7, f.o.b cars Birmingham, and is being firmly held at this figure. It is intimated that considerable No. 2 Foundry Iron has been sold short, and that a determined effort will be made to force the price down. Whether this can be accomplished of course remains to be seen. Sales during the week have been confined largely to carload orders for immediate delivery, We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.50	@	$10.75
Southern Coke, No. 2 Foundry	9.75	@	10.00
Southern Coke, No. 3 Foundry	9.25	@	9.50

Metal Market.

Pig Tin.—In a speculative way there has been quite a large turnover the past week. Sales and resales publicly announced in the wholesale market represent a total of about 585 tons, and deals representing half as much more were put through quietly. The movement of prices was narrow, particularly so when the volume of trading is considered. Together with the fact that deliveries to jobbers and consumers have been heavy, and that stocks are still unusually large on both sides of the Atlantic, this leads to the impression that the market is being carefully nursed by a master hand at the business. Some authorities claim, however, that a large "short" interest exists and has more or less influence upon the market, particularly for early deliveries. Prices for small parcels from store are rather easier, Straits Pig being quoted at 15¢ @ 15½¢, Banca at 16¢ @ 16½¢, and Straits in bars at 16¢ @ 16½¢ per lb.

Copper.—The market for Ingot is without important change. In fact, about the only feature is that the offerings of outside lots of Lake at a fraction under the lowest figures of last week have increased somewhat. The large companies have, however, been filling ordinary orders at the old price, which they do not appear to be anxious to cut. Jobbing business has been only fair, consumers still pursuing a conservative line in their purchases. Prices for small lots are unchanged from last week's quotations.

Sheet Copper.—A moderate business is reported, varying in none of its aspects from the conditions noted in last week's report. Prices for small lots from store are firm on a net basis of 15¢ ℔ lb.

Pig Lead.—Dealings have been on a somewhat larger scale, yet not up to what might reasonably be looked for, considering the narrow lines upon which buyers have operated for a month or six weeks past. Prices have remained stationary, American Pig in small lots being quoted at 3⅜¢ @ 3½¢ ℔ lb.

Solder.—Only a moderate demand is noted, with prices somewhat lower, owing to the decline in Pig Tin. Jobbers ask for ½ and ½ guaranteed, 11¢, and for No. 1, 9¢ ℔ lb.

Spelter.—No change has taken place here. Orders have been as few and as small as they were last month, and inquiries have afforded no indication of mored is position on the partof consumers to buy. The offering is not heavy, however, and prices remain quite steady. Good Western in small parcels from store rules at 4¢ @ 4¼¢ per pound.

Tin Plate.—Some increase in sales of fair sized lots from store has taken place during the week, and the aggregate of small sales has been rather larger than that of last week, while a little more interest is manifested in forward shipments, owing probably to the prospective curtailment of production on the other side, from the closing down of works on account of the wage dispute. Yet the market lacks real animation, and the volume of business lags behind the average for this season of the year. Canners and other large consumers still postpone making their forward contracts, and buyers in general are inclined to adhere to the conservative policy they have pursued for so long. The recent severe weather, too, has operated adversely on the demand in this section of the country. Prices are practically unchanged, but are inclined to weakness.

A London cable dispatch of January 9 to *The Iron Age* reports as follows in regard to the British Tin Plate market: Tin Plate market quiet, but values steady. Business confined chiefly to quick deliveries. Buyers lack confidence and prefer waiting developments. Wasters have been in better demand for Eastern account. The quotations, f.o.b. Swansea, are as follows:

Bessemer Cokes, IC 14 x 20	@ 9/6
Siemens Cokes, IC 14 x 20	9/9 @ 10/
J. B. Steel Cokes, IC 14 x 20	
Ternes, 20 x 28	18/6 @ 21/
Charcoals, IC 14 x 20	10/6 @ 12/6

G. Moser & Sons, Die makers and manufacturers of Tin Tags and Impression Plates, 225 West Second street, Cincinnati, Ohio, distribute to their friends in the trade a handsome calendar tastefully decorated in colors.

L. E. Wagar & Son, West Sand Lake, N. Y., were dissolved by the retirement of the senior member of the firm. His interest has been purchased by his son, A. U. Wagar, who continues the business in stoves, ranges, tin, steel and slate roofing.

CONDITION OF THE

Hardware Trade.

IT IS EARLY as yet to look for improvement in business, as the trade have not much more than closed the accounts of the past year and are completing their preparations for the coming season, travelers beginning to go out, and merchants, after the annual inventory, are making out their orders for goods necessary to complete their assortments. As these in many cases were permitted to run down to an abnormally low point, an opportunity is afforded them of purchasing freely, but this they seem as yet indisposed to do. In the matter of prices the market continues without especial strength, and while there are comparatively few announced changes there are indications of weakness and slight concessions in the prices of a good many goods. Reference is, however, often made to prices as so low that they are not likely to decline further, and that the termination of the downward tendency must come sooner or later. Goods are certainly cheap enough, and the indications of improvement in certain lines are regarded with satisfaction by all concerned.

Advices from Chicago. — As intimated in a previous report, the salesmen connected with the Chicago Hardware houses made a very short stay during their home visit this year. With few exceptions they are all now on the road and are again hard at work. The orders for the first week of the year were very much better than that of last year, showing increased buying in almost every line in which business is done at this season. The outlook is extremely encouraging, as prospects are improving even in districts which suffered most from short crops or low price of farm products.

Notes on Prices.

Wire Nails.—The Wire Nail trade is in hardly as good condition as it has been for the past two or three weeks, there being some indication of increasing irregularity in prices. The manufacturers report a good deal of inquiry, but the volume of business is not exceptionally heavy. Small lots from store in New York are held at about $1.15.

Advices from Chicago.—Manufacturers report a light inquiry. Distributers appear to be pretty well supplied with Nails to cover their requirements for some time into the future and are not disposed to add to their stocks at present. Small lots from stock stand at $1.10 and for direct shipment from factory at $1.05, with mixed carloads at $1.

Cut Nails.—There is little business doing, but some inquiries are reported and the trade evidently are disposed to purchase only as Nails are needed. The tone of the market is unchanged and quotations are apparently slightly shaded when necessary, and especially when the assortment is attractive. Small lots from store are quoted at 90 to 95 cents.

Advices from Chicago.— No special feature has developed since last report. Manufacturers are receiving small orders only, which have aggregated only a moderate business. Prices are maintained at $1 for small lots from stock.

Barb Wire.—The Barb Wire market continues to be characterized by a moderate demand, but the year opens with many orders on manufacturers' books and an encouraging outlook as to the volume of trade in 1895. Notwithstanding this satisfactory condition, as far as the demand is concerned, the tone of the market is rather weak and slightly lower prices are obtainable than have recently prevailed.

Advices from Chicago.—Immediate business is light, but manufacturers now report that they are well supplied with orders for some time to come and are therefore not soliciting business so actively. Quotations are still $2 for Galvanized and $1.65 for Painted in small lots for direct shipment from factory and $2.10 and $1.75 for small lots shipped from stock.

Tinware.—The market for Tinware, pieced and stamped, is in a very unsatisfactory condition and prices are low and irregular. List prices are to a large extent dispensed with and sales made at net figures. Competition between the manufacturers is decidedly active, and altogether the situation is far from satisfactory. There have been some rumors in regard to an understanding between the manufacturers by which more regularity could be imparted to the market in this line, but nothing evidently has as yet been accomplished in this direction. Under date of January 2, Lalance & Grosjean Mfg. Company, New York, announce the following changes in list prices as given in their catalogue, January, 1894:

Cocoa Dippers.

Page 250.—Nos.	51	151
Retinned	$2.20	2.40

Dish Pans.

Page 206.—Qt	30
IXXX, doz	$35.50
IXXXX,"	38.50

Plain or Pierced Milk Skimmers.

Page 241	30 and 35
Per gross	$8

Bread Raisers.

Page 208.—Qts	10	14	17	21
Doz	$28	34	40	46

Plain, Pie, Dinner and Scalloped Plates.

Page 194.—Inches	9
Gross	$12

Retinned Stamped Tea Kettles.

Page 221.—Nos.	14	16	18	20
Doz	$12.60	13.80	15.60	16.80
Page 221.—Nos.	22	24	26	28
Doz	$21.60	24.60	29.40	31.20

Rimmed Jelly Molds.

Page 13.—Pts:	¼	½	1	1½
Doz.	$3.65	7.30	8.75	10.30
Page 13.—Pts		2	3	4
Doz		$13.20	17.50	23

Soup Ladles.

Page 245.—Nos.	29	30	229	230
Doz	$2.35	2.65	2.20	2.45

Retinned Laundry Dippers.

Page 247.—No	120
Doz	$8.35

Retinned Cake Pans.

Page 226.—Add No	41½
Per doz. list	$3.15

Old Metals.—The market is quite dull, and prices are rather softer than they were at the close of the year. The following quotations represent the current rates paid by dealers in the city:

Heavy Copper	℔ 7 ¢
Light and Tinned Copper	℔ 6½¢
Heavy Brass	℔ 4¾¢
Light Brass	℔ 3¾¢
Lead	℔ 2¾¢
Tea Lead	℔ 2½¢
Zinc	℔ 2⅛¢
No. 1 Pewter	℔ 10 ¢
No. 2 Pewter	℔ 5½¢
Wrought Scrap Iron.	℔ gross ton $7.50 @ $8.00
Heavy Cast Scrap...	℔ gross ton 7.50 @ 8.50
Stove Plate Scrap	℔ gross ton 5.00
Burnt Iron	℔ gross ton 3.00

F. E. Myers & Bro.—The following is the price-list of Pumps manufactured by F. E. Myers & Bro., Ashland, Ohio. It will be observed that it is a relatively lower list compared with some used by other makers. It is subject to a discount of 55 per cent., f.o.b. Ashland:

No. 1, Fig. 328, 3-inch Shallow Well Pump	$13.00
No. 8, Fig. 328, 3½-inch Shallow Well Pump	15.00
No. 5, Fig. 307, 3-inch Deep Well Pump	15.00
No. 6½, Fig. 307, 3½-inch Deep Well Pump	17.00
No. 14, Fig 521, 3-inch Deep or Shallow Well Pump	15.00
No. 32, Fig. 523, 3-inch Deep Well Pump	17.00
No. 56, Fig. 331, 3-inch Shallow Well Pump	14.00
No. 69, Fig. 332, 3½-inch Shallow Well Pump	17.00
No. 70, Fig. 333, 2½-inch Deep Well Pump	15.00
No. 72, Fig. 333, 3-inch Deep Well Pump	15.00
No. 73, Fig. 333, 3½-inch Deep Well Pump	15.00
No. 102, Fig. 448, 3-inch Lift Pump	10.00
" 108, " 448, 3½ " "	12.00
" 128, " 510, 3 " "	7.00
" 131, " 510, 3½ " "	8.50
" 225, " 389, Windmill Pump	12.50
" 230, " 402, "	13.50
" 235, " 403, "	14.50
" 240, " 486, Regulator Pump	30.00
" 280, " 484, Imperial Cyclone Pump	18.00
No. 265, Fig. 572, Cyclone Tank Force Pump	7.00
No. 267, Fig. 483, Geyser Tank Force Pump	17.00
No. 268, Fig. 513, Low Down Tank Force Pump	16.00
No. 302, Fig. 477, Spray Pump complete	11.50
No. 320, Fig. 492, Bucket Spray Pump	5.50
" 330, " 547, Knapsack "	10.00

Cordage.—The demand for Rope is sluggish and the volume of business small. In view of the dullness of the market prices are to a certain extent nominal and the tone of the market is rather weak. Quotations are as follows for large lots, f.o.b. factory or New York, the price given being subject to a discount of 1½ per cent. for cash:

	Cents.
Manila, base	7
Sisal, base	4⅛
New Zealand, base	4⅛
Jute, base	4½

Agate and Granite Ware.—Under date January 1 increased discounts on Agate and Granite Ware are announced by the Lalance & Grosjean Mfg. Company of New York and St. Louis Stamping Company of St. Louis, the new discount being made 40 and 10 per cent. The following changes in the list prices of some of these goods are also announced:

Changes in List Prices of Granite Ironware.

Acme Improved Coffee Biggins.

With Granite Tops and Covers.

Nos.	201	201½	202	203	204	205
Per doz.	$14.50	16.50	18.50	20.50	22.50	25.00

With Patent Enameled Wood Handles and Retinned Fluted Covers.

No. 100, per doz	$9.75

Ham Boilers.

With Bail and Granite Drainer.

No. 118, each	$6.00
" 120, "	7.00

Seamless Water Buckets.

No. 114, per doz	$17.00
" 116, "	20.00

Seamless Water Buckets.

With Seamless Foot.

No. 214, per doz	$18.00
" 216, "	21.00

Wine Coolers.

No. 2, per doz.....$12 00

Covered Spit Cups.

No. 150, per doz.....$6.00

Improved Chafing Dishes.

With Nickel Plated Lamp and Stand.

No. 103, per doz., complete.....$30.00

With Hot Water Pan and Nickel Plated Lamp and Stand.

No. 203, per doz.....$36.00

Oblong Soap Dishes.

No. 50, per doz.....$3.50

Covered Oblong Soap Dishes.

No. 55, per doz.....$5.25

Coffee Flasks.

No. 1, per doz.....$7.00

Covered Seamless Royal Kettles.

With Retinned Covers.

Nos.	401	402	403	404	405
Per doz.	$4.50	5.25	6.25	7.25	8.25

With Granite Covers.

Nos.	401	402	403	404	405
Per doz.	$6.00	6.75	7.75	8.75	9.75

With Retinned Covers.

Nos.	406	407	408	409	410
Per doz.	$9.50	10.50	12.00	14.00	16.00

With Granite Covers.

Nos.	406	407	408	409	410
Per doz.	$11.00	12.25	14.50	16.50	18.75

Patent Covered Windsor Kettles.

With Retinned Covers.

Nos.	12	14	16	18	20
Per doz.	$5.00	6.00	7.00	8.00	9.00

With Granite Covers.

Nos.	12	14	16	18	20
Per doz.	$6.50	7.50	8.50	9.50	10.50

With Retinned Covers.

Nos.	22	24	26	28	30
Per doz.	$10.00	11.00	12.50	14.00	16.00

With Granite Covers.

Nos.	22	24	26	28	30
Per doz.	$11.50	12.50	14.50	16.50	18.75

Patent Stove Kettles.

Nos.	6	7	8
Per doz.	$9.00	11.00	13.00

Royal Tea Kettles.

Nos.	60	70	80
Per doz.	$17.00	20.00	24.00

Tea Kettles.

Extra Deep Pit Bottom.

Nos.	16½	18½	20½
Per doz.	$13.00	15.00	17.00
Nos.	22½	24½	26½
Per doz.	$19.00	22.00	26.00

Chamber Pails.

Seamless.

No. 3, per doz. (3½ gallons).....$30.00

Commode Attachment for Chamber Pails.

Nos. 10 and 20, per doz.....$12.00

Bed Pans.

No. 1, each.....$4.00

Oval Dish Pans.

Nos.	15	18	22
Per doz.	$18.00	20.00	24.00

Dust Pans.

No. 10, per doz.....$7.00

Lipped Saucepans.

With Rings.

Nos.	12	14	16	18	20
Per doz.	$4.50	5 50	6.00	7.00	9.00
Nos.	22	24	26	28	
Per doz.	$10.50	12.00	14.00	16.00	

Covered Seamless Royal Saucepans

With Retinned Covers.

Nos.	301	302	303	304	305
Per doz.	$4.50	5.25	6.25	7.25	8.25

With Granite Covers.

Nos.	301	302	303	304	305
Per doz.	$6.00	6.75	7.75	8.75	9.75

With Retinned Covers.

Nos.	306	307	308	309	310
Per doz.	$9.50	10.50	12.00	14.00	16.00

With Granite Covers.

Nos.	306	307	308	309	310
Per doz.	$11.00	12.25	14.50	16.50	18.75

Patent Stove Saucepans.

Nos.	6	7	8
Per doz.	$9 00	11.00	13.00

Patent Covered Windsor Saucepans.

With Retinned Covers.

Nos.	12	14	16	18	20
Per doz.	$5.00	6.00	7.00	8.00	9.00

With Granite Covers.

Nos.	12	14	16	18	20
Per doz.	$6.50	7.50	8.50	9.50	10.50

With Retinned Covers.

Nos.	22	24	26	28	30
Per doz.	$10.00	11.00	12.50	14.00	16.00

With Granite Covers.

Nos.	22	24	26	28	30
Per doz.	$11.50	12.50	14.50	16.50	19.00

Patent Covered Windsor Saucepans.

WITH RINGS.

With Retinned Covers.

Nos.	12	14	16	18	20
Per doz.	$6.00	7.50	9.00	11.00	12.00

With Granite Covers.

Nos.	12	14	16	18	20
Per doz.	$7.50	9.00	10.50	12.50	15.50

With Retinned Covers.

Nos.	22	24	26	28	30
Per doz.	$13.00	15.00	17.00	19.00	21.00

With Granite Covers.

Nos.	22	24	26	28	30
Per doz.	$14.50	16.50	19.00	21.50	24.00

Windsor Tea or Coffee Pots.

With Granite Covers.

Nos.	102	103
Per doz.	$11.00	13.00

Acme Tea Pots.

With Patent Enameled Wood Handles and Retinned Fluted Covers.

No. 1000, per doz.....$8.50

With Granite Covers.

No. 1000, per doz.....$9.50

Acme Coffee Pots.

With Patent Enameled Wood Handles and Retinned Fluted Covers.

No. 1005, per doz.....$8.50

With Granite Covers.

No. 1005, per doz.....$9.50

Royal Covered Seamless Sauce Pots.

With Retinned Covers.

Nos.	501	502	503	504	505
Per doz.	$4 50	5.25	6.25	7.25	8.25

With Granite Covers.

Nos.	501	502	503	504	505
Per doz.	$6.00	6.75	7.75	8.75	9.75

With Retinned Covers.

Nos.	506	507	508	509	510
Per doz.	$9.50	10.50	12.00	14.00	16.00

With Granite Covers.

Nos.	506	507	508	509	510
Per doz.	$11.00	12.25	14.50	16.50	18.75

Patent Covered Windsor Sauce Pots,

With Retinned Covers.

Nos.	112	114	116	118	120
Per doz.	$5.00	6.00	7.00	8.00	9.00

With Granite Covers.

Nos.	112	114	116	118	120
Per doz.	$6.50	7.50	8 50	9.50	10.50

With Retinned Covers.

Nos.	122	124	126	128	130
Per doz.	$10.00	11.00	12.50	14.00	16.00

Patent Covered Windsor Sauce Pots.

With Granite Covers.

Nos.	122	124	126	128	130
Per doz.	$11.50	12.50	14.50	16.50	19.00

Confectioners' or Family Scoops.

Round Edge or Bottom.

No. 202, per doz.....$5.00

Square Edge and Flat Bottom.

No. 203, per doz.....$5.00

Oyster Stands.

Per doz.....$21.00

Oblong Bread Trays.

No. 1, per doz.....$6.00

Round Trays.

Inches	10	12
Per doz.	$3.50	5.00

Granite Toilet Ware.

Water Carriers.

No. 1, each.....$2 50

Oval Foot Tubs.

Nos.	1	2	3
Per doz.	$21.00	24.00	28.00
No. 1 set, complete			6.25

Windsor Water Carriers.

No. 20, each.....$3.50

Windsor Slop Jars.

No. 20, each.....$3.50

Windsor Foot Tubs.

Seamless.

No. 20, each	$3 00
Windsor Set, No. 20, complete	10.00

Water Carriers.

No. 30, each.....$3.50

Slop Jars.

No. 30, each.....$3.25

Foot Tubs.

Seamless.

No. 30, each	$2.25
No. 30 set, complete	9 00

Water Carriers.

No. 40, each.....$3.50

Slop Jars.

With Bail.

No. 40, each.....$3.50

Foot Tubs.

Seamless, with Foot.

No. 40, each	$3 00
No. 40 set, complete	10 00

Changes in List Prices of Agate Iron Ware.

Windsor Tea or Coffee Pots.

Nos.	102	103
With Retinned Covers, per doz.	$10.00	$12.00
With Agate Covers, per doz	11.00	13.00

Acme Tea Pots.

No	1009
With Retinned Covers, per doz.	$8.50
With Agate Covers, per doz.	9.50

Acme Coffee Pots.

No	1009½
With Retinned Covers, per doz.	$8.50
With Agate covers, per doz.	9.50

Improved Coffee Biggins.

Nos.	200	200½	201	201½
Per doz.	$12.50	13.50	14.50	16.50
Nos.	202	203	204	205
Per doz.	$18.50	20.50	22.50	25.00

Coffee or Chocolate Pots.

Pints	4
With Retinned Covers, per doz.	$16.00
With Agate Covers, per doz.	17.00

Pit Bottom Royal Tea Kettles.

No. 80½, per doz.....$24.00

Flat Bottom Royal Tea Kettles.

Nos.	60	70	80
Per doz.	$17.00	20.00	24.00

Extra Deep Pit Bottom Tea Kettles.

Nos.	16½	18½	20½	22½	24½	26½
Per doz.	$13.00	15.00	17.00	19.00	22.00	26.00

Oval Dish Pans.

Quarts	15	18	22
Per doz.	$18.00	20.00	24.00

Oval Foot Tubs.

Nos.	1	2	3
Per doz.	$21.00	24.00	28.00

Infants' Seamless Baths.

No. 50, each	$5.00
No. 100, each	9.00

Covered Seamless Royal Cook Pots.

With Retinned Covers.

Nos.	401	402	403	404	405
Per doz.	$4.50	5.25	6.25	7.25	8.25

With Agate Covers.

Nos.	401	402	403	404	405
Per doz.	$6.00	6.75	7.75	8.75	9.75

With Retinned Covers.

Nos.	406	407	408	409	410
Per doz.	$9.50	10.50	12.00	14.00	16.00

With Agate Covers.

Nos.	406	407	408	409	410
Per doz.	$11.00	12.25	14.50	16.50	18.75

Covered Seamless Royal Saucepans.

With Retinned Covers.

Nos	301	302	303	304	305
Per doz	$4 50	5.25	6.25	7.25	8.25

With Agate Covers.

Nos	301	302	303	304	305
Per doz	$6.00	6.75	7.75	8.75	9.75

With Retinned Covers.

Nos	306	307	308	309	310
Per doz	$9.50	10.50	12.00	14.00	16.00

With Agate Covers.

Nos	306	307	308	309	310
Per doz	$11.00	12.25	14.50	16.50	18.75

Covered Seamless Royal Sauce Pots.

With Retinned Covers.

Nos	501	502	503	504	505
Per doz	$4 50	5.25	6.25	7.25	8.25

With Agate Covers.

Nos	501	502	503	504	505
Per doz	$6.00	6.75	7.75	8.75	9 75

With Retinned Covers.

Nos	506	507	508	509	510
Per doz	$9.50	10.50	12.00	14.00	16.00

With Agate Covers.

Nos	506	507	508	509	510
Per doz	$11.00	12.25	14.50	16.50	18.75

Strong Lipped Saucepans, with Rings.

Nos	12	14	16	18	20
Per doz	$4.50	5.50	6.00	7.00	9.00
Nos	22	24	26	28	
Per doz	$10.50	12.00	14.00	16.00	

Covered Windsor Saucepans, with Rings.

With Retinned Covers.

Nos	110	112	114	116	118	120
Per doz	$5.50	6 00	7.50	9.00	11.00	12.00

With Agate Covers.

Nos	110	112	114	116	118	120
Per doz	$7.25	7.50	9 00	10.50	12.50	13.50

With Retinned Covers.

Nos	122	124	126	128	130
Per doz	$13.00	15.00	17.00	19.00	21.00

With Agate Covers.

Nos	122	124	126	128	130
Per doz	$14.50	16.50	19.00	21.50	24.00

Stove Saucepans.

Nos	6	7	8	9
Per doz	$9.00	11.00	13.00	15.00

Covered Windsor Saucepans.

With Retinned Covers.

Nos	110	112	114	116	118	120
Per doz	$4.50	5.00	6.00	7.00	8.00	9.00

With Agate Covers.

Nos	110	112	114	116	118	120
Per doz	$6.00	6.50	7.50	8.50	9.50	10.50

With Retinned Covers.

Nos	122	124	126	128	130
Per doz	$10.00	11.00	12.50	14.00	16.00

With Agate Covers.

Nos	122	124	126	128	130
Per doz	$11.50	12.50	14.50	16.50	19.00

Stove Kettles.

Nos	6	7	8	9
Per doz	$9.00	11.00	13.00	15.00

Covered Windsor Sauce Pots.

With Retinned Covers.

Nos	110	112	114	116	118	120
Per doz	$4.50	5.00	6.00	7.00	8.00	9.00

With Agate Covers.

Nos	110	112	114	116	118	120
Per doz	$6.00	6.50	7.50	8.50	9.50	10.50

With Retinned Covers.

Nos	122	124	126	128	130
Per doz	$10.00	11.00	12.50	14.00	16.00

With Agate Covers.

Nos	122	124	126	128	130
Per doz	$11.50	12.50	14.50	16.50	19.00

Covered Windsor Kettles

With Retinned Covers.

Nos	410	412	414	416	418	420
Per doz	$4.50	5.00	6.00	7.00	8.00	9.00

With Agate Covers.

Nos	410	412	414	416	418	420
Per doz	$6.00	6.50	7.50	8.50	9.50	10.20

With Retinned Covers.

Nos	422	424	426	428	430
Per doz	$10.00	11.00	12.50	14.00	16.00

With Agate Covers.

Nos	422	424	426	428	430
Per doz	$11.50	12.50	14.50	16.50	19.00

Lipped Stewing or Preserving Kettles.

No. 600, per doz.....$70.00

Seamless Marking Pots.

No. 1, per doz.....$10.00

Seamless Straight Water Pails.

No	114	116
Per doz	$17.00	20.00

Seamless Flaring Water Pails.

No	214	216
Per doz	$18.00	21.00

Round Seamless Soup Tureens.

No. 220

With Agate Covers, per doz.....$24.00

Seamless Oval Soup Tureens.

No	200	300	400	500	600
Each	$7.50	8.50	9.50	10.50	11.50
No	201	301	401	501	601
Each	$6.00	7.00	8.00	9.00	10.00

Ham Boilers.

No	118	120
Each	$6.00	7.00

Wine Coolers.

No	2
Per doz	$12.00

Confectioners' or Family Scoops.

No	200
Per doz	$5.00

Confectioners' or Family Scoops.

No	300
Per doz	$5.00

Royal Seamless Mugs.

No	36
Per doz	$3.75

After Dinner Cups and Saucers.

No	201
Per doz. sets	$3.50

Coffee Flasks.

No. 1, per doz.....$7.00

Ale Measures.

Quarts	2	4
Per doz	$30.00	35.00

Dust Pans.

No. 10, per doz..... 7.00

Round Trays.

Nos	310	312
Per doz.	$3.50	5.00

Cigar Ash Receivers.

No. 5, Agate outside, White inside, per doz..... 3.50

Oblong Soap Dishes.

No. 50, per doz..... 3.50

Covered Oblong Soap Dishes.

No. 55, per doz..... 5.25

Patent Chafing Dishes.

No. 3½, per doz.....30.00

Seamless Pots.

No. 1, with Agate Covers, per doz....15.00

Chafing Dish Outfit.

Per set..... 5.50

Seamless Slop Jars.

No. 309, per doz.....$36.00

Commode Attachment for Chamber Pails.

No. 10, per doz.....$12.00

Seamless Chamber Pails.

No. 3, with Agate Covers, per doz...$12.00

Improved Slop Jars.

No	209	210
Per doz	$30.00	33.00

Toilet Water Pitchers.

No	701	702	703	704
Per doz	$8.00	10.00	12.50	15.00

Toilet Bowls.

No	26	28	32	34
Per doz	$4.25	4.75	6.75	7.75

Complete Sets.

No	7	8	9	10
Per doz	$12 25	14.75	19.25	22.75

Patent Horn Bed Pans

No. 3, each.....$6.00

Bed Pans.

No. 1, each.....$4 00

Seamless Spit Cups.

No. 15, per doz.....$6.00

Berth Cups.

No. 25, per doz.....$20.00

Urinals.

No. 1, per doz.....$27.00

Urinals.

No. 2, per doz.....$24.00

Garbage Pails.

No. 412, each..... 2.50

Toilet Fountains.

No. 600, complete, each..... 6.75

Toilet Fountain Sets.

No. 650, complete, each..... 9.00

Douche.

No. 60, complete, each..... 6.75

Crescent Toilet Sets.

Nos	301	302	303
Each	$2.00	1.75	2.50
No. 300, complete set			6.25

Brunswick Toilet Sets.

No	1	2	3
Each	$3.50	3.00	3.50

Complete set..$10.00

Cassel Toilet Sets.

Full set, consisting of 7 complete pcs.$12.00

King Toilet Sets.

Nos	101	102	103
Each	$3.25	2.25	3.50

Complete set...$9.00

Prince Toilet Sets.

Nos	201	202	203
Each	$3.50	3.00	3.50

Complete set..$10.00

Odorless Commode Chamber Pails.

No. 30, each.....$6.00

Above changes in list prices also apply to Crystal Steel, Blue and White, Blue and Blue, and White Enameled Wares.

Washboards.—The following is the price-list of Washboards put on the market by the Saginaw Mfg. Company, Saginaw, W. S., Mich.. It will be of interest as showing the line of these goods which they are putting on the market. Terms, f.o.b. cars Saginaw, 60 days, or 2 per cent. discount for cash in 10 days:

Solid Zinc.

	Per dozen.
Crescent, family size, bent frame	$2.50
Red Star, family size, stationary protector	2.50
Red Star, family size, reversible protector	2.75
Red Star, laundry size, stationary protector	3.75
Red Star, laundry size, reversible protector	4.00
Electric, family size, stationary protector	2.25
Electric, family size, reversible protector	2.50
Electric, laundry size, stationary protector	3.50
Electric, laundry size, reversible protector	3.75
Ivy Leaf, family size, stationary protector	2.00
Ivy leaf, family size, reversible protector	2.25
Special Star, family size, stationary protector	1.90
Special Star, family size, reversible protector	2.15

Double Zinc Surface.

Crescent Globe, family size, stationary protector	$2.50
Crescent Globe, family size, reversible protector	2.75
Diamond, family size, stationary protector	2.50
Diamond, family size, reversible protector	2.75
Diamond, laundry size, stationary protector	3.75
Diamond, laundry size, reversible protector	4.00
Unique, family size, stationary protector	2.50
Unique, family size, reversible protector	2.75
Saginaw Globe, family size, stationary protector	2.25
Saginaw Globe family size, reversible protector	2.50
Saginaw Globe, laundry size, stationary protector	3.50

Saginaw Globe, laundry size, reversible protector..... 3.75
Wilson, family size, bent frame..... 2.25
Saginaw, family size, stationary protector..... 2 00
Saginaw, family size, reversible protector..... 2.25
Sunrise, family size, stationary protector..... 2.00
Sunrise, family size, reversible protector..... 2.25
Sunrise, laundry size, stationary protector..... 3.25
Sunrise, laundry size, reversible protector..... 3.50

Single Zinc Surface.

Naiad, protector, family size, open back, perforated..... 1.90
Naiad, protector, laundry size, open back, perforated..... 3 00
The Queen, protector, family size, open back..... 1.85
Crescent Globe, protector, family size, solid back..... 1.85
Crescent Globe, protector, family size, ventilated back..... 1.85
Diamond, protector, family size, solid back..... 1.85
Diamond, protector, family size, ventilated back..... 1.85
Diamond, protector, laundry size, solid back..... 3.00
Diamond, protector, laundry size, ventilated back..... 3.00
Saginaw Globe, protector, family size, solid back..... 1.75
Saginaw Globe, protector, family size, ventilated back..... 1.75
Sawinaw Globe, protector, laundry size, solid back..... 2.75
Saginaw Globe, protector, laundry size, ventilated back..... 2.75
Wilson, bent frame, family size, solid back..... 1.75
Wilson, bent frame, family size, ventilated back..... 1.75
Saginaw, protector, family size, solid back..... 1.50
Saginaw, protector, family size, ventilated back..... 1.50
Morning Star, protector, family size, solid back..... 1.50
Morning Star, protector, family size, ventilated back..... 1 50
Eagle, protector, family size, solid back..... 1.50
Eagle, protector, family size, ventilated back..... 1.50
Langtry, pail size..... 1.10

Spring Balances.—The manufacturers of this line of goods are desirous of obtaining such business as is going and are making efforts to secure it by the quotation of relatively low prices. With the active competition which characterizes the market quotations are thus slightly lower.

Revised Price-list of Radiators.

The American Radiator Company send out from Chicago under date of, January 1 new net price sheets of their extensive line of radiators. Their Regular List is as follows for steam and water, direct and indirect.

Excelsior Indirect Radiators

FOR STEAM.

Connected with right and left threaded nipples, 12 square feet per section, $1.50 per section.

Perfection Pin Indirect

FOR STEAM OR WATER.

Standard size, 10 square feet, $1.30 per section.

Extra large, 15 square feet, $2.00 per section.

Dining Room Radiators.

Perfection, 50 per cent. off list.
Detroit, 50 per cent. off list.

tire surface to the direct currents of cold air, are more efficient than those whose peculiar formation causes a formidable percentage of surface to depend on air partially heated by contact with the outer portion of loops, to perform the work of condensation, we have arranged the inclosed 'special list' to meet the necessities which severe competition occasionally imposes upon steam fitters, and to which we invite careful consideration. Our new three column radiator named Rococo, the shipment of which we shall be able to commence in the very near future, will make our line of special radiators the largest and most comprehensive on the market; and we therefore trust you will give careful consideration to the special list we herewith inclose. In this connection we beg to state that the name of Perfection Flue has been changed to Monarch Flue, and, for the sake of brevity, Detroit Flue Renaissance to Italian Flue."

The special list here referred to is as follows :

Direct Steam

Per square foot of heating surface.

Hight, inches	45	38	32	31	26	25	23	22	20	19	18	16	15	14	13
Italian Flue	..	16	..	.	..	..	..	..	..	..	..	..	..	..	..
Monarch Flue	..	15	17	..	19	..	21	..	..	..	..	23	23	23	..

Direct Water

Per square foot of heating surface.

Hight, inches.	45	38	32	26	23	22	20	18	16	15	14	13
Rococo	16½	17	19	21	..	23	..	25	..	..	..	..
Italian Flue	...	17	19	21	..	..	25	..	..	..	..	..
National Four Column	...	16	18	20	..	..	24	.	..	..	..	..
Monarch Flue	...	16	18	20	22	..	..	..	24	24	24	..
Detroit Flue	...	..	..	..	..	..	21	22	23	..	24	25

Another list they publish refers to the Favorite radiators made by the M. Steele Company, Springfield, Ohio, of which the American Radiator Company handles the entire output.

Direct Water.

Per Square Foot of Heating Surface.

Hight, Inches	45	38	32	31	26	25	23	22	20
Perfection: Connected with right and left threaded nipples	21½	22	24	.....	26	.....	.....	.....	30
Detroit, Ornamental Fluted: Connected with right and left threaded nipples	21½	22	....	24	.....	26	.....	.....	30
National: Connected with slip nipples	20½	21	23	.. ..	25	....	27	.....	29
National Single Column: Connected with slip nipples	.....	24	.....	.....	29	.....	.....	.....	....
Peerless: Connected with right and left threaded nipples	.....	21	.....	.....	... ..	.....	.....	.....	...
Detroit, Plain Fluted: Connected with right and left threaded nipples	19½	20	.....	22	....	24	.....	.....	28

Excelsior Indirect Radiators.

FOR WATER.

Connected with right or left threaded nipples. 12 square feet per section, $1.65 per section.

Specialties.

STEAM.

Column.....25 cents per section.
Curved..... " "
Corner.....$1.50 per radiator.
Window..... 5 cents per section.
Stairway.. .....10 " "
Direct-indirect..... 8 " "

WATER.

Column.....40 cents per section.
Curved. .....40 " "
Corner..... .....$2.00 per radiator.
Window.....10 cents per section.
Direct-indirect..... 8 " "
Perfection radiator tops 6 " "

Added to prices quoted for direct radiators.

In a circular accompanying the new lists they say:

"Severe competition among contractors frequently leads to the use of certain types of radiators, which, having a large amount of heating surface in each section, reduces the cost of manufacture; and while we firmly adhere to the principle that radiators, which, by the scientific formation of their loops, expose practically their en-

Direct Steam.

Per Square Foot of Heating Surface.

Hight, Inches	45	38	32	31	26	25	23	22	20	19
Perfection: Connected with right and left threaded nipples	19½	20	22	.....	24	.....	26	.....	28	....
Detroit, Ornamental Fluted: Connected with right and left threaded nipples	19½	20	.....	22	.....	24	.....	.....	28	...
National: Connected with right hand threaded nipples	19½	20	22	.. ..	24	... ..	26	.....	28	....
Ideal: Connected with right hand threaded nipples	19½	20	22	.....	24	.....	26	.....	28	. ..
National, Single Column: Connected with right hand threaded nipples	.....	22	25	.....	27	.....	29	.....	.....	...
Excelsior, with Cast Iron Top: Connected with right hand threaded nipples	. . ..	20	.....	22	.....	24	.....	26	.....	28
Peerless: Connected with right hand threaded nipples	18½	19	21	.....	23	.....	25	.....	27	....
Detriot, Plain Fluted: Connected with right and left threaded nipples	17½	18	.....	20	.....	22	.....	.....	26	...

DeHaven & Co., Limited, Pittsburgh, Pa., are directing the attention of the trade to a line of Cinderella Kitcheners, which are referred to as being an entirely new series of all cast iron Ranges and adapted for burning hard or soft coal or wood. These Ranges are further referred to as having embodied in their construction many new and desirable features. They are also made with feet and skirting in lieu of the low closet, and they also have a full complement of high shelves and high closets. The reservoir is made of planished copper and holds 15 gallons of water. The trade are invited to send for descriptive catalogues of the Cinderella Stoves and Ranges.

Metal and Miscellaneous Prices.

CHICAGO, JANUARY 10, 1895.

Tin—

Straits pigs .....16¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14.....@	$5.75
	IC, 12 x 12.....@	5.75
	IC, 14 x 20.....@	5.75
	IC, 20 x 28.....@	11.50
	IX, 10 x 14.....@	7.50
	IX, 12 x 12.....@	7.50
	IX, 14 x 20 .....@	7.50
	IXX, 14 x 20.....@	9.25
	IXXX, 14 x 20.....@	11.00
	IXXXX, 14 x 20....@	12.75
	IX, 20 x 28 .....@	15.00
	IXX, 20 x 28.....@	18.50
	IXXX, 20 x 28.....@	22.00
	IXXXX, 20 x 28....@	25.50
	DC, 12⅛ x 17..... @	5.50
	DX, 12⅛ x 17.....@	7.25
Allaway Grade.	IC, 10 x 14.....@	5.50
	IC, 12 x 12.....@	5.50
	IC, 14 x 20.....@	5.50
	IC, 20 x 28.....@	11.00
	IX, 14 x 20 ....@	6.75
	IXX, 14 x 20....@	8.00
	IX, 20 x 28.....@	13.50
	IXX, 20 x 28....@	16.00

Coke Plates—Bright.

		Per box.
Steel Coke—IC, 10x14,14x20.		$4.75 @ 5.00
IC, 14x20. 90 ℔		4.25 @ 4.50
IC, 14x20. 100 ℔		4.50 @ 4.75
10 x 20.....	@	7.25
20 x 28.....	@	10.00
IX, 10x14, 14 x 20.....	@	6.25
B.V. Grade. IC, 10x14, 14x20.....	@	....

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	...@$5.00
20 x 28	$9.50@10.00
IX. 20 x 28	12.00@12.50
Worcester Brand and equal.—	
IC. 14 x 20..	@ 5.25
IC, 20 x 28..	10.00@10.50
IX, 14 x 20..	6.25@ 6.50
20 x 28..	12.50@13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56		$12.50
XX, 14 x 56	$29.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.87½
IX, 10 x 14, 12 x 12, 14 x 20. 6.62½

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.75
IX, 10 x 14, 12 x 12, 14 x 20. 7.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.25
IX, 10 x 14, 12 x 12, 14 x 20.. 8.00

Usual extras or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20.....$5.75
IX, full weight, 14 x 20..... 7.50

Irondale A A:

IC, full weight, 14 x 20..... 5.25
IX, full weight, 14 x 20..... 6.75

Irondale A:

IC, full weight, 14 x 20..... 5.00

Irondale B:

IC, 100 lbs., 14 x 20 ..... 4.75
IC, full weight, 14 x 20..... 4.85

Irondale C, IC, 14 x 20, 100 lbs..... 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates.—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $5.00
Old Hundred, IC, 14 x 20, 100 lbs.... 4.75
R. W. & B., IC, 20 x 28, 216 lbs.....10.00
Old Hundred, IC, 20 x 28, 200 lbs.... 9.50

Roofing Plates.

Palm, IC, 20 x 28	@$10.00
Palm, IX, 20 x 28.....	@ 12.25
Empire, IC, 20 x 28.....	@ 10.75
Empire, IX, 20 x 28.....	@ ....
Hickory, IC, 20 x 28.....	@ 11.50
" IX, 20 x 28.....	@ 14.10
Alaska (heavily coated), IC, 20x28	@ 13.50
Alaska IX, 20 x 28.....	@ 16.70
Special, IC, 20 x 28.....	@ 13.50
" IX, 20 x 28.....	@ 16.50
Niagara, IC, 20 x 28	9 50
Iroquois, IC, 20 x 28.....	9.00

Westmoreland:

IC, 14 x 20..... 5.12½
IC, 20 x 28..... 10.25

Kenwood:

IC, 20 x 28..... 10.00

Furmston:

IC, 20 x 28..... 9.75
Irondale AA, IC, 14 x 20..... ....
Irondale A, IC, 20 x 28..... 10.50
Irondale B, IC, 20 x 28..... 10.10
Each extra cross $1.50.

Challenge, IC, 20 x 28.....10.50

Juno:

IC, 14 x 20..... ....
IC, 20 x 28..... ....

Illinois, Old Method:

IC, 20 x 28..... 13.50

E. L.:

IC, 20 x 28..... 11.00

Jessie:

IC, 20 x 28..... 10.50

Old Process:

IC, 14 x 20..... 8.00
IX, 14 x 20..... 9.50
IC, 20 x 28.....16.00
IX, 20 x 28.....19.00

H. B. L., Old Style:

IC, 14 x 20..... 7.00
IX, 14 x 20..... 8.25
IC, 20 x 28.....14.00
IX, 20 x 28.....16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.65

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16.....℔	2 1-10¢	2 8-10¢
17 to 20.....℔	2 2-10¢	2 9-10¢
21 to 24.....℔	2 3-10¢	3 ¢
25 and 26.....℔	2 4-10¢	3 1-10¢
27.....℔	2 5-10¢	3 2-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....18¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata, or first quality.....dis.75&10%

Copper—

Ingot.

Lake.....11 ¢ @ 11½¢
Casting Brands..... 10 ¢ @ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch.....	$0.35
Plain, ⅝ inch up to ¾ inch.....	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch.....	.41
Plain, 5-16 inch up to ⅜ inch.....	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch.....	1.00
Plain, ⅛ inch up to 3-16 inch.....	1.50
Plain, 2 inch up to 3 inch.....	.38
Plain, 3 inch and larger.....	Special.
Plain, smaller than ⅛ inch.....	Special.
Bronze and Copper.....	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... .....4¢

Sheet Zinc—

600 ℔ casks.....$4.75
300 ℔ casks,..... 4.95
Loose sheets..... 5.05

Solder—

½&½..... 10½@11½¢
Extra Wiping..... 9½@10½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9½¢

Lead—

Soft Pig Lead.....3½¢
Bar.....4¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe—

1¼ and under, Plain.....57½&10&10%
1¼ and under, Galv .....50&10&10%
1½ and over, Plain..... 67½&10&10%
1½ and over, Galv.....57½%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes 27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd.....65%
Ritchie's Spiral Lock Seam, Galv'd....60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated..... 65%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list..... 50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz..... .....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list..... .....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ D, 2 ¢
" " Brown.....℔ D, 1½¢
" " Purple.....℔ D, 2½¢
" Ground in oil, B. Red ℔ D, 6½¢
" Ground in oil, Red..℔ D, 6½¢
" Ground in oil, Brown ℔ D, 5½¢
" Ground in oil, Purple ℔ D, 6 ¢
Linseed Oil, Boiled, in bbls.....59¢
Linseed Oil, Raw, in bbls .....56¢
Mineral Paints..... .....2@4¢
Orange Mineral..... .....8¢
Pure White Lead in Oil..... ..5½@5¾¢
Dry White Lead in bbls..... 4¾@5½¢
Red Lead, American.....5¼@5¾¢
Red Venetian, English, dry .....1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs.....7½¢
Sipe's Japan Oil, in bbls. ℔ gal.... .34¢
Spirits Turpentine, in bbls., ℔ gal@34½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.50
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.15
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.50
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, JANUARY 11, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots

Small lots.....	℔ D, 68¢
100-℔ lots.....	℔ D, 60¢
Ton lots.....	℔ D, 58¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots.....	℔ D, 60¢
100-℔ lots.. ...	℔ D, 55¢
Ton lots.....	℔ D, 53¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots.....	℔ D, 55¢
100-℔ lots.....	℔ D, 53¢
Ton lots.....	℔ D, 50¢

Antimony—

Cookson .....℔ D, 9¼@9½¢
Hallett's ....℔ D, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.	
¼-in. up to 2-in.....	$0.35	25 @ 30%
⅜-in. up to ¾-in.....	.36	
½-in. up to ⅝-in.....	.38	
⅜-in. up to ½-in	.41	
5-16-in. up to ⅜ in.....	.48	
¼-in. up to 5-16-in.....	.65	
3-16-in. up to ¼-in.....	1.00	
⅛-in. up to 3-16-in.....	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger.....	Special	
2 in. to 3 in., to No. 16, inclusive.	.38	

Copper and Bronze Tubing—

8¢ ℔ D more than brass.

Conductors—

Corrugated. *Round or Square.*

Galvanized.....	60&10%
Galvanized, Locked Joints	60&10%
Tin.....	60&10%

Spiral Riveted—

Galvanized..... .....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ℔ D, net

Ingot.

Lake.....	10½¢
Ansonia Grade Arizona.....	10¼¢
Ansonia Grade Casting.....	9¾¢
Planished.....	net
Sheet and Bolt.....	15¢ ℔ D, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized....	60&10%
Lap or Slip Joint Terne.	60%

Eave-Trough Miters—

Lap or Slip Joint..... .....list, net

Elbows—

Plain Adjustable—

Tin.....	70%
Galvanized.....	70%

Crimped Tubing—

Re-Tinned or Galvanized..... .....35%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.

Tin.....	35%
Galvanized.....	35%

Corrugated.

Flat Crimp.

Galvanized.....	60%

Round or Square.

Tin.....	60%
Galvanized.....	60%

Iron, Sheet—

Black.

	Commou American.	R. G. Cleaned American.
Nos. 10 to 16....℔ D	2.25... ..	2.60¢
Nos. 17 to 21 ℔ D.	2.35.....	2.70¢
Nos. 22 to 24....℔ D,	2.45.....	2.80¢
Nos. 25 and 26..℔ D.	2.55.....	2.90¢
No. 27..... .....℔ D.	2 65.....	3.00¢
No. 28.....℔ D,	2.75.....	3.10¢
American B. B.....	.....℔ D,	4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....	℔ D, 11@11½¢
Patent Planished....℔ D, A, 10¢; B, 9¢.	5%
Craig Polished Sheet Steel.....℔ D	8½¢

Galvanized.

	B. B	
Nos. 10 to 16.....		75&5@75& 7½% off.
Nos. 17 to 21.....		
Nos. 22 to 24.....		
Nos. 25 to 26.....		
No. 27.....		
No. 28.....		
No. 29.....		
No. 30.....		

Lead—

American Pig.....	3¾@3½¢
Bar.....	4@4½¢
Pipe....	5½¢ 20%
Tin Lined Pipe.....	12½¢ 20%
Block Tin Pipe.....	30¢ 20%
Sheet.....	6½¢, 20%

Old Lead in exchange, 2½¢ ℔ D.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets.....	30%
Netting, Painted Sheets.....	20%
Door Mats, Galvanized.....	25%
Window Guards, Paneled.....	15%
Tree Guards, Paneled.....	15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's. 100 @ 500 ℔	5¾
Lead, Amn. White, in oil..... ..	@ 5½
Lead, Red, bbls. and ½ bbls... ..	@ 5¾
Lead, Red, kegs..... ..	@ 5¾
Ocher, American..... ..	@ 1½
Red Venetian, American..... ..	@ 1¾
Linseed Oil:	
Raw, ℔ gal..... ..	@ .56
Boiled..... ..	@ .59
Spirits Turpentine:	
In bbls..... ..	@ .30
Putty:	
In barrels and ½ bbls..... .01½	@ .01¾
In tubs..... .01¾	@ .01¾
In tin cans..... .01¾	@ .02¼
In bladders..... .01¾	@ .02¼
Roofing Material, &c.:	
Asphaltum, Trinidad, Refined, ℔ ton.....	$30.00@$35.00
Asphaltum, Rock, ℔ ton.....	$14.00
Coal Tar Felt, 1 Ply, ℔ D.....	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch ℔ bbl.....	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron. Soil—

"Standard" Pipe, 2 to 6 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe," " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ lb	₩ cnb. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4½	38½¢
Rock Wool, ordinary	2½	27¢
Rock Wool, extra	7½	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.42@$1.45
Rosin, E. & F.....₩ bbl. $1.55@$1.62½
Rosin, G. & H. .....₩ bbl. $1.72½@$2.00
Rosin, I. & K.....₩ bbl $2.40@$2 80
Rosin, M. & N ₩ bbl $3.05@$3.40

Seamless Brass Tubes .net List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.70@ 4.00
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr..... 3.90@ 4.25
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.50@ 2.75
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½&½, guaranteed .....11¢
No. 1..... 9@9½¢
Prices of Solder indicated by private rands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢ } 5% dis.
75¢ extra for keg.
Kegs, about 55 lb, ₩ lb.....4¢

Yager's Soldering Salts.
¼-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter..... 4¢@4¼¢
Bertha (pure) .....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb.....16@16½¢
Straits, pigs, ₩ lb.....15@15½¢
Straits in bars, ₩ lb.....16@16½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $6.50
Alderly, extra quality, IC, 14 x 20..5.62½
Allegheny, IC, 14 x 20..... 4.50
" IX, 14 x 20..... 5 75
Anchor IC, 14 x 20..... 4.37½
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20. ..... 6.50
Black Diamond (Extra Coated), IC, 14 x 20 ..... 7.50
Bonus (Extra Coated), IC, 20 x 28..11.50
" " " IX, 20 x 28..14.50
Boston, IC, 14 x 20..... 6.25
Brooklyn, IC, 14 x 20 ..... 4.50
Capitol, IC, 14 x 20..... 4.25
Central, IC, 14 x 20 ..... 4.75
Climax, IC, 14 x 20 ..... 4.50
Columbia, IC, 14 x 20..... 6 25
Columbus, IC, 14 x 20..... 4.75
Dunlap's Double Dipped, IC, 14 x 20 7.50
" " " IX, 14 x 20 8.75
" Domestic, IC, 20 x 28..... 10.00
Empire, IC, 14 x 20 ..... 5.12½
Eureka, IC, 20 x 28..... .....10.00
Eureka 200 lbs., IC, 20 x 28.... .... 9.75
Excelsior, IC, 14 x 20..... ..... 4.75
Filbert, IC, 14 x 20..... 7.25
Flag, IC, 14 x 20. ..... 4.25
Florida, IC, 14 x 20 ..... 4.75
Flushing, IC, 14 x 20..... 6 25
Freeport (Hand dipped and Resquared). IC, 14 x 20 ..... 6.50
IX, 14 x 20..... 7.75
Globe, IC, 14 x 20 .. . 4.50
Golden Star Old Style, IC, 20 x 28...15.00
" " " " IC, 20 x 28...18.00
Grace, IC, 14 x 20..... 4.25
Hamilton's Best Redipped, IC, 14x20 7.75
" " " IX, 14x20 9.25
Hickory (Resqnared), IC, 14 x 20... 5.50
Juniati, IC, 20 x 28..... .....11.50
Juno, IC, 14 x 20..... 5.50
Kensington, IC, 14 x 20..... ..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20 ..... 4.75
Laufman's Apollo (Resqnared), IC, 14 x 20..... 6.75
Laufman's Apollo (Resqnared), IX, 14 x 20..... 8.25
Leominster, Extra Coated, IC, 14x20.6.37½
Lion (Stamped), IC, 14 x 20..... 5.75
Lulu, IC, 20 x 28..... .....10.50
" IX, 20 x 28 .....13.50
Maple, IC, 14 x 20 .... 5.75
Merchant's Roofing (Resqnared). IC, 14 x 20..... 7.50
Meurer Roofing, IC, 14 x 20..... 7.75
National, IC, 14 x 20..... 5.50
Nava, IC, 20 x 28 .. ..10.50
New Castle Old Method, IC, 20x28, 18.00
New Castle Palm, IC, 20x28..... .....14.50
Old Colony, IC, 14 x 20 ..... 7.50
Osborn's Old Process, IC, 20 x 28.....14.00
" " " IX, 20 x 28....17.00
Osceola, Old Style, IC, 14 x 20..... .. 7.25
" " IX, 14 x 20 .. 8.75
Pennsyl Old Method (Trehle Coated), IC, 14 x 20..... 7.25
Phillips' Roofing, IC, 14 x 20..... 7.00
Phœnix, IC, 14 x 20..... ..... 4.75
Pullman, IC, 14 x 20..... ..... 5.75
Republic, IC, 14 x 20..... 4.75
Scott's Extra Coated (Resquared), IC, 14 x 20 .... 8.00
Scott's Extra Coated (Resqnared), IX, 14 x 20..... ..... 9.50
Standard, IC, 14 x 20 ... ... 4.15
Star IC, 20 x 28 .....11.00
Superior, IC, 14 x 20..... 4.50
Taylor's Old Method, IC, 14 x 50.... 6.50
Taylor Old Style (Resquared), IC, 14 x 20..... ..... 7.50
Taylor Roofing, IC, 14 x 20 ..... 6 75
The Osborn Roofing, IC, 20 x 28.....12.25
" " " IX, 20 x 28.....15.25
Thomson's Puritan, IC, 14 x 20.....5 50
Tip Top, IC (Resquared), 14 x 20.... 4.88
" IX " 14 x 20.... 6.13
Triumph, Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20 ... .4.37½
Westmoreland, IC, 14 x 20.... ..... 6.25
Willow, IC, 14 x 20..... 5.25
Zero, IC, 14 x 20..... 4.50

American Bright Plates—

Almond, IC, 14 x 20.....$5.25
Brilliant (Tissue Packed), IC, 14x20. 8.00
Brooklyn, IC, 14 x 20..... ..... 5.50
Century, IC, 14 x 20..... ..... 5.00
Climax, IC, 14 x 20. ..... 4.87½
Excelsior, IC, 14 x 20..... ..... 6.50
" IX, 14 x 20.. .... 7.50
Florence, IC, 14x20..... 5.50
Florida, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Gladys, IC, 14 x 20..... 4.50
Hazel, IC, 14x20..... 5.50
Ivy, IC, 20 x 28 ....12.00
" IX, 20 x 28..... .....15.00
Linden, IC, 14x20..... 5 50
Merchant's Dipped, IC, 14x20..... 10.00
Merlon, IC, 14x20.. ..... 6.00
Mint, IC, 14x20..... ..... 5.00
New Castle Best Palm Charcoal, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
New Castle Palm Charcoal, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. .. 8.00
New Castle, Charcoal, IC, 14 x 20... 6 25
" " IX, 14 x 20... 7.50
New Castle, S. Charcoal, IC, 14 x 20. 6.00
" " IX, 14 x 20. 7.25
New Castle Palm Coke, IC, 14 x 20.. 5.75
" " IX, 14 x 20.. 6.85
New Castle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Oak, IC, 14 x 20..... 4.75
Palma, IC, 14x20..... 6.00
Pansy, IC, 20 x 28 .....10.50
" IX, 20 x 28 .....13.00
Phœnix, IC, 14x20..... . . 5.37½
" IX, 14x20..... 6.75
Royal, IC, 14x20..... 6.25
U. S., IC, 14x20 .... 7.25
Versailles, IC, 14 x 20 .....5.75
Walnut, IC, 14 x 20 ..... 4.65
Youghiogheny, IC, 14 x 20... .....6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$6 25
20 x 28.....12.50
Pontymister Old Style Grade, IC, 14 x 20..... 5.50
20 x 28.....11.00
IX, 14 x 20..... 6.50
20 x 28.....13.00
Worcester Grade, IC, 14 x 20..... 4.50
20 x 28..... 9.00
IX, 14 x 20..... 5 75
20 x 28.....11.50
Dean Grade.—IC, 14 x 20..... 4.25
20 x 28..... 8.50
IX, 14 x 20..... 5.50
20 x 28.....11.00
Ahercarne Grade.—IC, 14 x 20..... 4.00
20 x 28..... 8.00
IX, 14 x 20..... 5.50
20 x 28.....11.00
Mansel Grade, IC, 20 x 28.....8.00

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ lb.

Melyn and Calland Grade. IC, 10 x 14..... $5.25
" " IC, 12 x 12..... 5.50
" " IC, 14 x 20..... 5.25
" " IC, 20 x 28..... 10.50
" " IX, 10 x 14..... 6.50
" " IX, 12 x 12..... 7 00
" " IX, 14 x 20..... 6.50
" " IX, 20 x 28..... 13.00
" " DC, 12½ x 17..... 5.00
" " DX, 12½ x 17..... 6.50
Allaway Grade. IC, 10 x 14..... 4.75
" " IC, 12 x 12..... 5 00
" " IC, 14 x 20..... 4 75
" " IC, 20 x 28..... 9.50
" " IX, 10 x 14..... 5.50
" " IX, 12 x 12..... 5 75
" " IX, 14 x 20..... 5.50
" " IX, 20 x 28..... 11.00
" " DC, 12½ x 17..... 4.25
" " DX, 12½ x 17..... 5.00

Coke.
Steel Coke.—IC, 10x14, 14x20..... 4.25
10x20..... 6.50
20x28..... 8.50
IX, 10x14, 14x20..... 5.25
B. V. Grade.—IC, 10x14, 14x20..... 4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$11.50
IXX, 14x28..(112 sheets)..... 11.90
IXX, 14x31..(112 sheets)..... 13.25

Tinning—Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—

Improved Lock Frame, per doz.... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv ....50&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892..... ....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 lb casks..... .....₩ lb 4¾¢
Per lb..... .....5¼¢

It Is Reported—

Arkansas.

That A. S. Jenkins, Hardware merchant, ARGENTA, has been succeeded by the Lamberson Hardware Company.

California.

That Daly & Snavely, Hardware merchants, GLENDORA, have sold out.

Colorado.

That the Florence Hardware Company, FLORENCE, have been incorporated by John Campbell, Charles Campbell and William Campbell, with a capital stock of $10,000.

Connecticut.

That Arthur Griggs, who has for 22 years been connected with the Hardware firm of N. T. Bushnell & Co., NEW HAVEN, and for the past four years has been manager of their Bicycle department, has resigned as secretary of the company and will go into business for himself.

Georgia.

That Bell & Fite will open a new Hardware store at AMERICUS.

Illinois.

That John Bride is soon to open a new Hardware store at METAMORA.

Indiana.

That a show window in the Hardware store of Pickard Bros., FORT WAYNE, took fire a few days since, resulting in damage estimated at $300.

That L. H. Gonser has purchased a Hardware store at SOUTH BEND.

That Campbell & Davis, in the Hardware business at BLOOMINGTON, dissolved January 1.

Iowa.

That a new Hardware store is soon to be opened at GARDEN GROVE.

That D. M. Deshak is now conducting the Hardware business formerly carried on by D. M. Deshak & Co., GRAFTON.

That F. F. Fisher, WEST BRANCH, is remodeling his Hardware building. He will put in a plate glass front and will also add new counters, shelving, floor, &c.

That the Hardware store of Havan & Moorhead at CLARKSVILLE was broken into by thieves a short time since and robbed of $50 in cash and a few revolvers.

That Reinhart Thompson, COLESBURGH, has disposed of his Hardware business to Thompson & Smith.

Kansas.

That Cox Bros., Hardware, &c., ALTON, have sold out to Wilson Black.

That F. M. Spaulding, Hardware, &c., MINNEAPOLIS, has sold out.

Kentucky.

That the Hardware firm of George O. Hart & Son, PADUCAH, have been incorporated. The directors are George O. Hart, Geo. T. Hart and Harry Hank. The capital stock is $50,000.

Maine.

That H. P. Getchell will soon open a new Hardware store at HALLOWELL.

That McKenney & Hurd, Hardwaremen, lost $9000 in a large fire, at BIDDEFORD, on the 30th ult.

Massachusetts.

That Walter E. Jones of EAST DOUGLAS is about to open a branch store at MANCHAUG.

That fire on the morning of the 6th inst., in the Hardware store of Bartlett & Dow, LOWELL, did considerable damage. The origin of the fire is unknown, and the loss cannot be estimated as yet, although it is large. The insurance, which is $31,000, will, however, cover it.

That James S. Murphy, who has been with the Salem Hardware Company, SALEM, Mass., and has recently withdrawn from that concern, has purchased an interest in the firm of Frank E. Putnam & Co., PEABODY.

That F. Arthur Noble of the Hardware firm of Gladwin & Noble Bros., WESTFIELD, has been elected a member of the board of directors of the First National Bank.

That Frank S. Fowler has severed his connection with the Way Hardware Company, WILLIMANTIC, Conn., to enter the Hardware business as partner with John Morrison, also formerly of WILLIMANTIC, at SALEM. Mr. Fowler has been identified with the Hardware business for about 23 years.

Michigan.

That Abell, Phillips & Co., Hardware, ALLEGAN, have sold out to John F. Dryden, who will continue the business.

That the Saginaw Hardware Company, SAGINAW, have purchased the Shook Hardware stock at PINCONNING, and will continue the business under the management of Harvey Shook.

That on January 1 Clarence H. Emmons of Emmons Bros., Hardware merchants, MARQUETTE, removed to ONTONAGON to take charge of the Corbett Hardware store, S. H. Corbett having disposed of his interest to him. Mr. Corbett will hereafter devote his entire attention to the office of Sheriff, to which he was elected last fall.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

First-class METAL PATTERN FITTER, capable of taking charge of pattern department of large manufacturing company. "Pattern Fitter," office of *The Metal Worker*, 96-102 Reade street, Now York City. Jan. 12

A good WOOD PATTERN MAKER. "F. W. R.," P. O. Box 625, Louisville, Ky. Jan. 12

A live STOVE SALESMAN that has and can sell goods—no other need apply—to travel Central aud Southeastern Indiana and Western Ohio; to represent a good line of goods manufactured by an Indiana manufacturer; in applying, state how long you have been on the road; give age, whom you have traveled for, how long with last employer; give reference; salesman located at Cincinnati preferred. "Indiana," office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. Jan. 12

TRAVELING SALESMAN; first-class steel range salesman; one thoroughly conversant with steel ranges; state age, territory traveled and with whom last employed. "Steel Range," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 12

A competent man to manage large tin shop; must be successful solicitor, experienced and first-class furnaceman, thorough mechanic, with experience in fine job and sheet metal work; executive ability of a high order necessary. Wm. Lyle Dickey & Co., Omaha, Neb. Jan. 12

A good man who understands the manufacturing of steel furnaces; must come well recommended. Foster Baily, 10 Addison street, North Indianapolis, Ind. Jan. 12

First-class metal PATTERN FITTER, capable of taking charge of pattern department of large manufacturing company. "Capable," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

A FOREMAN for a steam, hot water and hot air heating and plumbing business, employing 20 men; is located in a live New England town of about 10,000 inhabitants; must be thoroughly familiar with all the details of the business; strictly temperato; of good memory and judgment; a hustler and able to control men; a man who has been in business for himself preferred; to the right man an interest in the business is open if desired; state age, experience, reference and salary expected. "Enterprise," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

A good man to do PIPING and general jobbing in a tin shop; state wages. Jas. A. Sandford, Bridge Hampton, N. Y. Jan. 12

SALESMAN for a line of hot water, steam and hot air furnaces for the State of New Jersey; send memorandum of experience with your answer. "N. H. F. Co.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

FURNACE SALESMAN, to handle complete line soft coal, hard coal and wood furnaces on salary or commission; good opportunity for first-class man. "Carbon," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

FOREMAN for pattern shop in a first-class stove establishment; one who is thoroughly conversant with the stove pattern business, and also up to date on gas stove construction. Address with full particulars, recommendations and salary required, "Pattern Shop," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

STOVE PLATE MOUNTER; one who understands the handling of men and is competent to take charge of a mounting department can hear of a good position by addressing "X. Z.," office of *The Metal Worker*, 96-102 Reade street, NewYork City. Jan. 5

A young man competent to figure on plans and specifications for builders' hardware, also to have knowledge of bookkeeping; German-American preferred. Rendtorff Bros., 154 North avenue, Chicago, Ill. Jan. 5

TRAVELING SALESMEN visiting the plumbing or tinning trade can add valuable side line to their business without interfering with same by addressing D. B. Hilton Company, 480 Clermont avenue, Brooklyn, N. Y. Jan. 5

SITUATIONS WANTED.

By a good TINSMITH; well experienced in furnace, cornice and general job work; married and temperate; permanent situation desired; 20 years' experience. C. M. Acuff, Pekin, Ill. Jan. 12

PIG IRON SALESMAN, now representing a well-known house in New York and New England, wishes to make a change at once; will travel or locate in any territory; refer to present employer. "S N.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

SALESMAN, now at liberty, former line pig iron; I want to travel with hardware or any other good line; best of references as to ability, habits, &c. "White," office of *The Metal Worker*, 96-102 Reade street, New York. Jan. 12

By a WOOD PATTERN MAKER of practical and proficient knowledge of stove and range work from the drafting table to the sand; 12 years' experience; six years foreman of large pattern shop. "Wood," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

By a PLUMBER, 22 years of age. P. O. Box 515, River Head, L. I., N. Y. Jan. 12

Young man, 22 years of age, desires to work at the plumbing and gas fitting trade; has all his own tools; six years' experience at business; furnish best of references; will go any part of United States. I. H. Snyder, 120 Race street, Pottsville, Pa. Jan. 12

As a SPINNING IRON WORKER on tin and all kinds of stamped ware; 22 years' experience; can do anything in the line of spinning, trimming, beading and wiring. Chas. Seider, 263 Floyd street, Brooklyn, N. Y. Jan. 12

As TRAVELING AGENT for stoves and furnaces in New York State; 12 years' experience; can give best of references. J. F. Smith, 680 Fifth avenue, Lansingburg, N. Y. Jan. 12

By an ELECTRO PLATER of over 30 years' experience; thoroughly practical and competent in all branches; reference. "M. H. Electro," 35 Scheafer street, Cleveland, Ohio. Jan. 12

By a young man, 19 years of age, who has been an assistant to a tinsmith and steam fitter; would like to finish trade; steady and sober. "Jersey," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

By a GOLD, SILVER, NICKEL, BRASS and BRONZE PLATER of 20 years' experience; strictly temperate; thoroughly practical in all the finishes known to the trade. "S. H. C.," Box 10, Oakville, Conn. Jan. 12

By a practical CORNICE, SKYLIGHT, TINNER and FURNACE MAN; 25 years' experience; eight years at last place; references; 40 years of age, married, temperate. "Cornice," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

STOVE, HEATER and RANGE SALESMAN open for an engagement; established trade in Pennsylvania, New Jersey and Delaware; over ten years with one house; would not object to working new territory. "F.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Jan. 12

SALESMAN wants a good line to handle in Wisconsin; now employed with large Chicago firm; best of refereuces; will work on a basis of $50 a month and commission and pay his own expenses. "Wisconsin," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

By a thoroughly practical mechanic, in manufacturing sheet metal goods; understand handling drawing and cutting preses; also the making of dies; have had several years' experience in managing skilled aud unskilled help. "D. S. J.," 176 South Clinton street, Chicago, Ill. Jan. 12

At plumbing; three years' experience in a town of 13,000 inhabiiants; would like to work under instructions and finish trade; city or country; willing to work cheap. H. Simons, American House, Andover, N. Y. Jan. 12

By a young man, as TINSMITH; city or country; also had experience as coffin maker. H. Shefts, 9 Stanton street, New York City. Jan. 12

By a TIN and SHEET IRON WORKER and JOBBER; three years' experience; city or country; moderate wages. Henry Ranenberg, Shelburne Falls, Mass. Jan. 12

By a general jobbing TINSMITH on inside and outside work; steady work desired; city or country. "Tinsmith," Cold Spring, Putnam County, N. Y. Jan. 12

By an experienced TINSMITH on iuside and outside work; also good furnace worker; would like steady employment. "Tinner," Box 562, Canonsburg, Pa. Jan. 12

As BRASS MOLDER, one who thoroughly understands the trade, having had several years' experience in Sweden and America; moderate wages. Waldemer Jippson, 703 Lafayette street, Jamestown, N. Y. Jan. 12

A STOVE MOUNTER who has carried on a plumbing, steam heating aud general jobbing business for the last two years, would accept a position where a good workman and a steady man is appreciated; have all necessary tools, or would join a reliable party in business. P. O. Box 330, Bedford, Bedford County, Pa. Jan. 12

By a young man, a position fitting iron patterns or as salesman in wholesale or retail stove store; also understauds setting heaters and making pipes, casings, &c.; salary no object. Box 115, Augusta, Oneida County, N. Y. Jan. 12

As CLERK in retail hardware house; have also had experience at tin roofing and structural iron work. Edwin Weisenboru, 318 Court street, Brooklyn, N. Y. Jan. 12

By first-class PLUMBER; city or country. J. Fahhce, 2234 First avenue, New York City. Jan. 12

By a first-class MECHANIC, at plumbing, steam, hot water gas fitting, furnace and chamber heating, blow pipe, drying room and exhaust steam work; also low pressure steam and hot water for dwellings; do all tin and sheet iron work; handle steam and power machinery; can estimate and take full charge; 32 years of age; sober and steady; last place as foreman; understands electrical work; references if desired. H. Kelly, 561 Broadway, Brooklyn, E. D., N. Y. Jan. 12

As FOUNDRY FOREMAN, by a man who is thoroughly competent; ten years' experience; thoroughly posted in mixing and melting iron; strictly sober and reliable. F. W. Romberg, East Chattanooga P. O., Tenn. Jan. 12

A PATTERN MAKER and DRAFTSMAN, also a CARVER and DESIGNER, both having wide experience in getting up stoves, would like to engage together with some reliable stove firm. "Modern Work," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

By a good, all round TINNER, who has been at the tin and hardware business for 12 years; can furnish good references as to habits and ability; an American born German, 28 years old, married; steady job; Chicago or vicinity preferred. Fred. Schuster, 727 West Lincoln street, Chicago, Ill. Jan. 12

At plumbing, tinning, gas fitting and pump work; six years' experience at city and country work; references; single. "J. M.," 684 Main street, Ansonia, Conn. Jan. 12

By a FOUNDRY SUPERINTENDENT, with a concern making steam and hot water boilers and hot air furnaces; practical molder, with a thorough knowledge of all kinds of cored work and economical cupola practice; competent to take entire charge of a plant employing any number of men; first-class reference. "Superintendent," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

By an able mechanic with business ability and a thorough knowledge of TIN and SHEET METAL WORK as done in job and contract shops, also experienced in steam and hot water heating; can draft plans in detail and estimate from architects' plans; am strictly temperate and reliable. J. P. Lisk, Palmyra, N. Y. Jan. 5

By a PLUMBER; 26 years of age; 10 years' experience at plumbing and gas fitting; can furnish good reference. J. T. Hanly, 27 Pleasant street, Canandaigua, N. Y. Jan. 5

By a young man of several years' experience, as inside, city or traveling salesman. R. L. Oram, 233 West 120th street, New York City. Jan. 5

By a young married man who is a good roofer, gutter and spout hanger; No. 1 furnace, range and heater hand; good general in and outside worker; can figure on furnaces and hot air work; will go to any part of the United States where a good man is wanted. Wm. Carrico, 1035 Milwaukee avenue, Chicago, Ill. Jan. 5

To represent a stove or stove and furnace manufacturer, as SALESMAN, at works or on the road; experienced in estimating and making contracts, taking care of established trade, selling and establishing new agencies, settling and collecting accounts; references furnished. "J. B. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

By March or April 1, by a man who understands ROOFING, SPOUTING and ASSORTMENT WORK; also a fair knowledge of furnace work; married, honest, sober and steady; position desired in a town of 3000 or 4000 in Ohio. "H. E. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 5

As PLUMBER'S HELPER; would like to finish trade; one and one-half years' experience. John Rourke, 32 Tailor street, Waterbury, Conn. Jan. 5

By a practical FURNACE WORKER and JOBBER. "P. W.," Providence Post Office, R. I. Jan. 5

By a first-class TINSMITH and ROOFER; 20 years' experience. A. Shipman, 2332 Taylor street, Philadelphia, Pa. Jan. 5

Special Notices.

RECEIVER'S SALE.

Notice is hereby given that by virtue of an order of the Howard Circuit Court in the case of John S. Connor, trustee, versus the William G. Fischer Manufacturing Company, the undersigned offers for private sale on and after the twelfth day of January, 895, all of the real estate owned by the said plant and situated in Kokomo, Howard County, in the State of Indiana. He will also offer for sale at the same time all of the machinery, boilers, engines, tools, appliances, patterns and patents belonging to and used in the manufacture of ranges and safes. In making said sale, he will offer to sell the real estate separately and also the machinery, tools, etc., above specified, or he will sell them as an entirety and will receive bids accordingly.

Terms, one-third cash, balance in nine and eighteen months with interest at 6%, with approved security.

G. W. LANDON, Receiver.

For Sale or To Rent.

Hard ware. Stove, Tin, House Furnishing business, established over 25 years. A good store and shop with public hall above, the only shop in vicinity. A first-class dwelling house next door. Close to depot and post office. The stock of goods at present is low, so it will require but small capital. Just the spot for a young man. Would rent the store, shop and house, but would prefer to sell on easy terms. Address "W. B.," Box 35, L. Grangeville, N. Y.

FOR SALE CHEAP FOR CASH.

A full set of Tinsmiths' Tools and Machines in good order. One set of pipe fitting tools, used very little, consisting of vise, stocks and dies cutting from ¼ to 2 inch pipe. Building for shop situated on main street in business center of town of 3000 inhabitants, about 30 miles from New York. All the above, including stock of pumps, stoves, lead and iron pipe, tin, copper, iron, zinc, stove pipe and elbows, dampers, soil pipe fittings, solder, rosin, roofing nails and good will of business, for the sum of $500 cash. Address at once "GOOD OFFER," No. 526, office of *The Metal Worker*, 96-102 Reade St., N. Y.

WANTED.

A practical corniceman can make favorable lease of established shop. Some capital and good references required. Address "H. H.," office of *The Metal Worker*, 59 Dearborn St., Chicago.

WANTED.

A medium size Drop Press in good condition. Send full particulars. Address "DROP PRESS," office of *The Metal Worker*, 96-102 Reade Street, New York.

FOR SALE.

130 tons of Sheet Steel from a wrecked stand pipe, a large portion in good condition. Address

P. O. BOX 155,
Maryville, Mo.

PATENT EAVE TROUGH HANGER FOR SALE.

A rare chance for roofing or tinners' supply manufacturing concern. Latest out. Best in the market. Good investment. Whole or royalty. For sample and further particulars address C. LUMM, Garrett, Indiana.

WANTED.

A second hand Circle Moulding Roller Machine; must be in good condition. Name price. Address

G. F. C. KLOEPPINGER,
130 Ottowa St., Toledo, O.

FOR SALE.

An old established Hardware, Plumbing and Tin business in one of the best towns in California. Will invoice about $5000. Population 5000 and thickly settled surrounding country. Owner has made a small fortune in a few years and doing a good business at present. No shopworn stock. Best of reasons for selling will be given to inquirers. Address "PACIFIC," care *The Metal Worker*, P. O. Box 521, New York City.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

Special Notices.

WANTED.

Manufacturing firm would like to hear from parties who have a good patent article or novelty of any description, with view to buying or manufacturing on royalty.

PROUDMAN BROS.,
Meriden, Conn.

FOR SALE.

A No. 8 Sturtevant Blower, Countershaft and Pulley complete. This blower has been melting from 10 to 12 tons of iron per hour. Address

SCANLAN & CO.,
Louisville, Ky.

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,

Solicitors of Patents.

OFFICES:
PHILADELPHIA,
Forrest Building, 119 S. 4th St
NEW YORK,
Potter Building, 38 Park Row
WASHINGTON,
Atlantic Building, 928 F. St.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.
PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.
E. B. STOCKING, Attorney at Law,
611 F ST., N. W., WASHINGTON, D. C.

Special Notices.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

KEUFFEL & ESSER CO.,

127 Fulton and 42 Ann Streets, NEW YORK.

Branches: 111 Madison Street, Chicago.
708 Locust Street, St. Louis.

Drawing Materials AND Surveying Instruments.

Write for

Keuffel & Esser Co.'s Catalogue of 1895.

26th Edition.

Enlarged by over 100 pages. The most complete and reliable catalogue, representing the largest and most complete stock in this line.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

FOUNDRY FOR SALE.—Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first-class foundry.

Address

"STOVE FOUNDRY,"

office of *The Metal Worker*, 96-102 Reade Street, New York.

COOK STOVE PATTERNS FOR SALE.

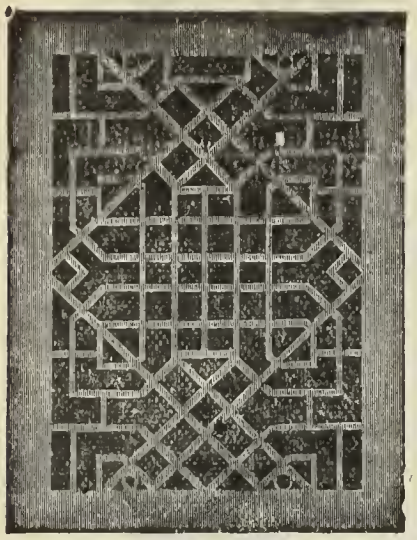
Iron Patterns, boarded ready for the sand, 12 sizes and styles, ovens as follows: 12 x 14, 14 x 16, 16 x 18, 18 x 20. These patterns are arranged to make two separate cook stoves.

EUGENE MUNSELL & COMPANY,
218 WATER STREET, NEW YORK.

Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.



Warm-Air Registers, Ventilators, Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.

USEFUL BOOKS.

Sheet Metal Worker's Instructor.

By R. H. WARN; illustrated by 32 plates and 37 woodcuts; 178 pages; 8vo, cloth, ...$3

The Tinman's Manual and Builder's and Mechanic's Handbook.

By J. R. BUTTS; 9th edition; illustrated; 204 pages; 12mo, cloth $1.25

The Tinsmith's Helper and Pattern Book.

With Useful Rules, Tables and Diagrams used by the Fraternity. By H. K. VOSBURGH; limp cloth.....$1

Workshop Companion.

By JOHN PHIN; 164 pages, 4⅛ x 6⅛ inches; boards, $0.30; also cloth, $0.60

Gas Fitting.

A practical handbook, treating of every description of gas laying and fitting. By J. BLACK; 121 illustrations; 130 pages; 12mo, cloth. ..$1

A Practical Workshop Companion for Tin, Sheet-Iron and Copper-Plate Workers.

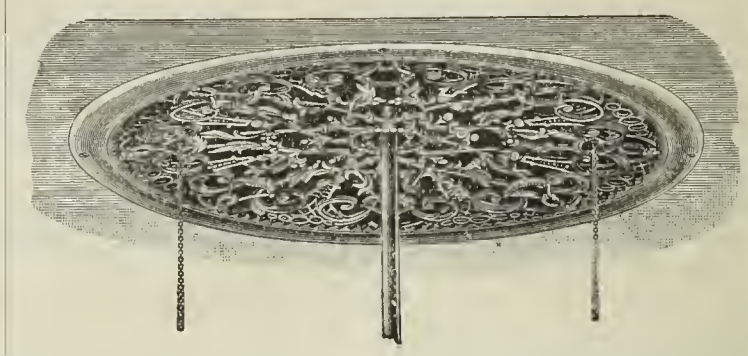
Containing Rules for describing various kinds of patterns used by Tin, Sheet-Iron and Copper-Plate Workers. Practical Geometry. Mensuration of Surfaces and Solids; Tables of the Weights and Strengths of Metals and other Materials; Tables of Areas and Circumferences of Circles; Composition of Metallic Alloys and Solders, with numerous valuable receipts and manipulations for every-day use in the workshop. By LEROY J. BLINN; new, enlarged edition, 296 pages, cloth.....$2.50

Sent, post-paid, on receipt of price by

DAVID WILLIAMS,
Publisher and Bookseller,
96-102 Reade St., New York

TUTTLE & BAILEY MFG. CO.,

REGISTERS, VENTILATORS, &c.



CARVED CEILING VENTILATOR—WITH VALVES.

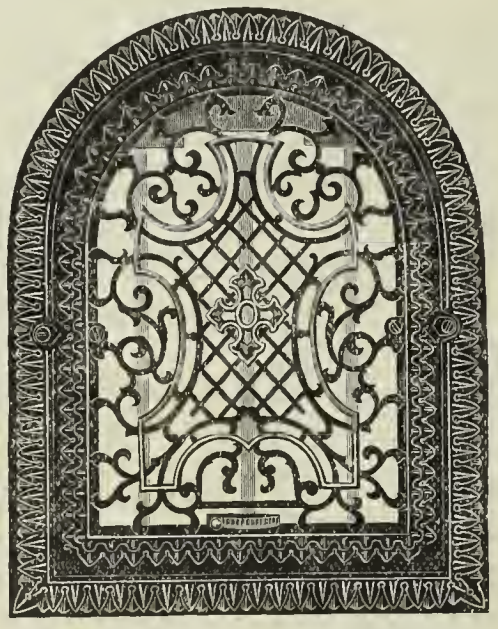
REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.

WM. HIGHTON & SONS,

MANUFACTURERS

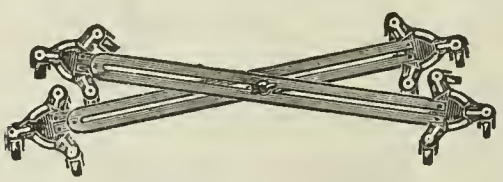
Hot Air Registers,



Ventilators, Etc.

CIRCULAR TOP REGISTER
With Wall Frame.

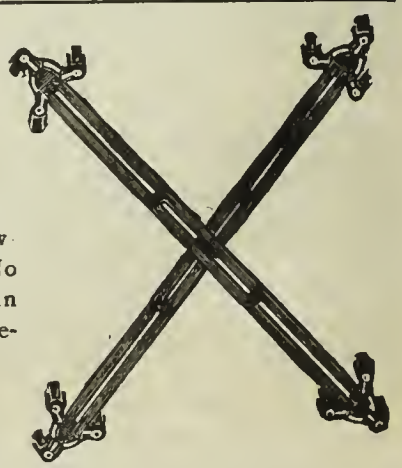
BOSTON, MASS., - and - NASHUA, N. H.



THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

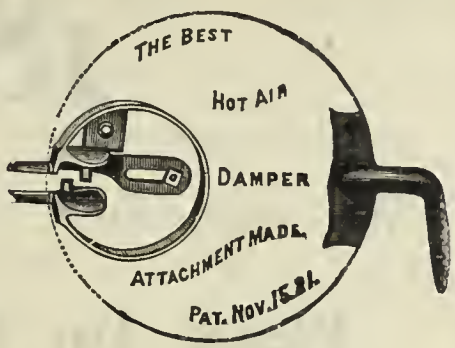
STELLWAGEN & KYNOCH, St. Ignace, Mich.



BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, New York.

Crown Damper and Crown Damper Attachment.





NICKEL PLATED HANDLE. PUT UP 1 DOZ. IN A BOX.

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

AMERICAN Dampers and Clips.

WAFFLE IRONS.

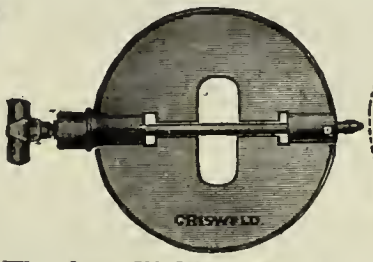
THE BEST



For Gas or Gasoline Stoves.

Easy to Clean, Long Wood Handles.

BUY *NO OTHER.*



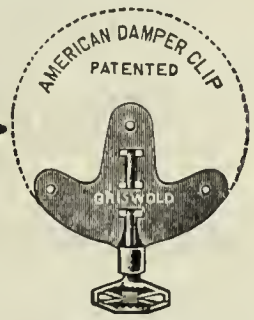
Wood or Nickel Handle.

BEST SELLER.

ASK FOR THE

AMERICAN.

Buy no Other.



JUST OUT.

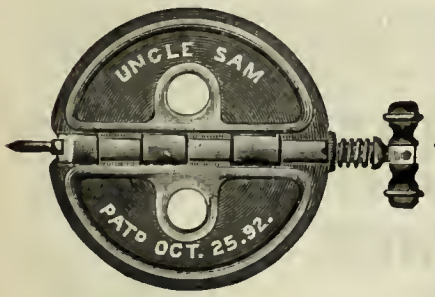
BEST CLIP MADE.

Send for Samples.

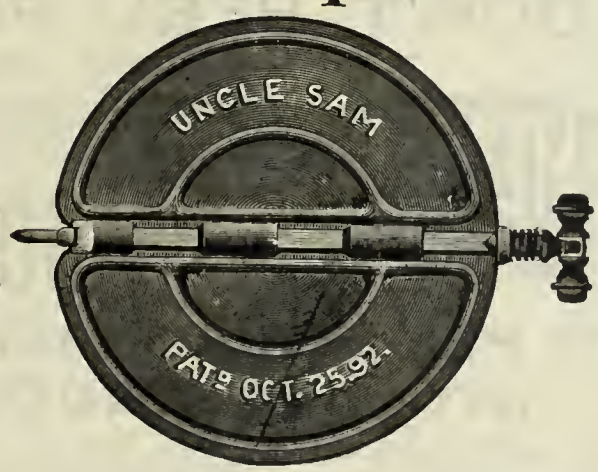
GRISWOLD MFG. CO.,

ERIE, PA.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers

The Packard Enameling Co.,



400 NORTH AVE.,

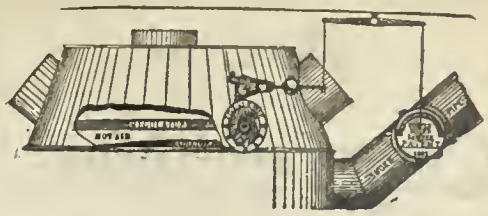
Warren, O.

—MANUFACTURERS OF—



Plain, Stained and Enameled Handles, Knobs and Pail Woods.

WRITE US FOR CATALOGUE AND PRICES. OUR WORK EXCELS.

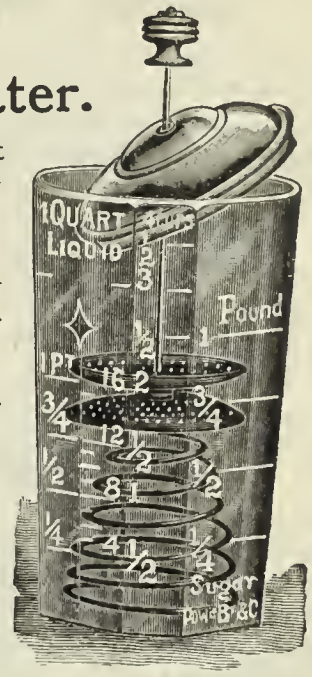


I have the Best Automatic Furnace Regulator made up to the present time, and it is solid, durable and easy to put on. Damper with copper bearing. Wholesale and retail. Twelve years in use.

W. E. PUFFER.

8 PECK SLIP, NEW YORK.

THE WONDERFUL LIHGTNING Egg Beater.



Perfect beating in 1 minute.

A combined dry and liquid measurer.

The cheapest and neatest of 'em all.

Once tried always used.

2 sizes.

Write for Prices.

LIGHTNING DASHER EGG BEATER CO.,

TOLEDO, O.

A Model Obituary.

This is the way the editor of the Benton *Argus* speaks of a woman who died in that town recently: "While it is almost a crime to speak ill of the dead, we feel it a duty to tell the truth about Miss Mary Boyer, who died last night. She never spoke a decent word about any being, living or dead, and slander sprung from her mouth like the toads from the girl in the fairy tale. If she goes to heaven we don't want to be there, and we believe we voice the sentiment of every man, woman and young lady in this burg. We gladly contribute a quarter for ice for Mary. She will need it."

Why She Named the Baby.

He was a lazy man—never did any chores about the house—but he was great on attending church meetings and singing in a loud and unmusical voice anything that he could hold on to with a few notes.

"Hold the Fort," was his favorite, and about the house he daily sang as best he could this hymn. His wife was a weak little woman and dared not protest.

By and by a baby came.

"Fine boy," said he. "What shall we call him?"

"We will call him Fort," she murmured with more spirit than he had seen since their wedding day.

"Why Fort?" asked he.

"Because then you will want to hold it."

And he sat in the woodshed an hour, wondering whether she was joking or in earnest.—*St. Louis Star Sayings.*

Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10 inches, Cloth. Price, $3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

CONTENTS:

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Sauce pans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS,

Publisher,

96-102 Reade St., NEW YORK.

For

1895

We respectfully solicit your orders for

Pieced Tin Ware,
Stamped Tin Ware,
Japanned Tin Ware,
Black Sheet Iron Ware,
Galvanized Sheet Iron Ware,
Enameled Ware,

and guarantee satisfaction, both as to quality and prices.

Respectfully,

The Geuder & Paeschke Mfg. Co.

Manufacturers,

St. Paul Ave. and 15th St., Milwaukee, Wis.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the

HENIS PRESS

Lightest, Handlest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

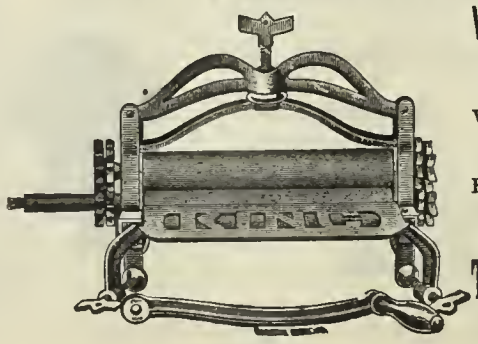


Weight, 16 ounces.
Length, 10 inches.

Can be sold in all seasons.

Write to Manufacturers for Prices.

WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue:

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.

ROCHESTER STAMPING WORKS, ROCHESTER, NEW YORK,



"ROCHESTER" TEAPOT.
Patented.

WANT **50,000** NAMES

To which they may address their

NEW CATALOGUE

For 1895.

No Goods Genuine without our Name.



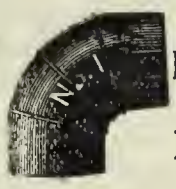
"ROCHESTER" CUSPIDOR.
Patent Pending.



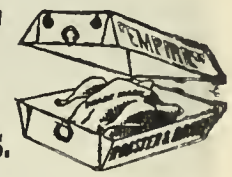


NEW YORK ELBOW CO.,

18 Cliff St., N. Y. City.



Makers of
Elbows
AND
Roasters.



The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O,



THE S. & P.

SOUP DIGESTERS,

Either Tinned or Enameled, with steam valve and covers ground to fit tightly. The aroma is saved. The only practical mode of making delicious soups. They extract all of the marrow from the bone.

THE STUART & PETERSON CO.,

BURLINGTON, N. J., U. S. A.

☞ *SPECIAL GOODS TO ORDER.*

Porcelain Lining to Order.

THE TRIUMPH COOKER,

WITH LOCK COVER.

STEAMLESS, ODORLESS AND NON BOIL-OVER.

THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.

A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.



THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997,—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

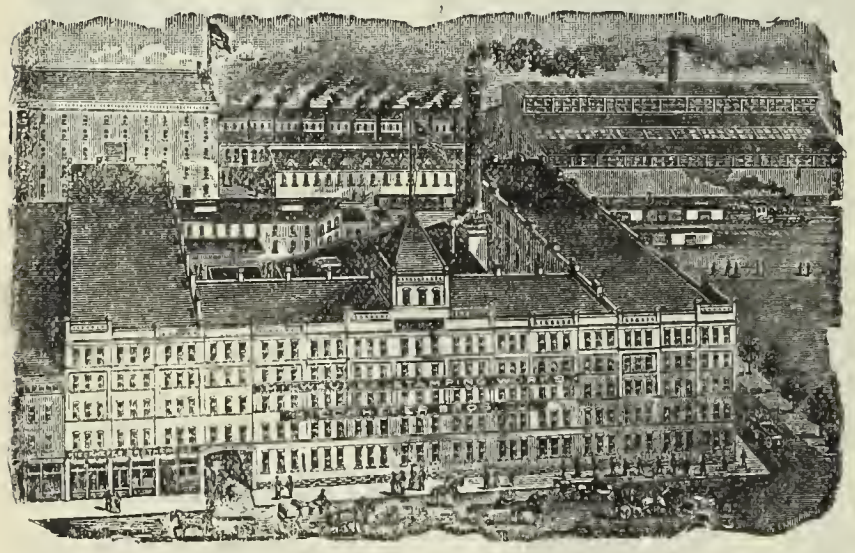


Agents for SPLENDID OIL COOKING STOVES and MAJESTIC OIL HEATING STOVES,

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED, JAPANNED AND ENAMELED PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.

"PRINCESS" CHILD'S TRAYS.

PATENTED.



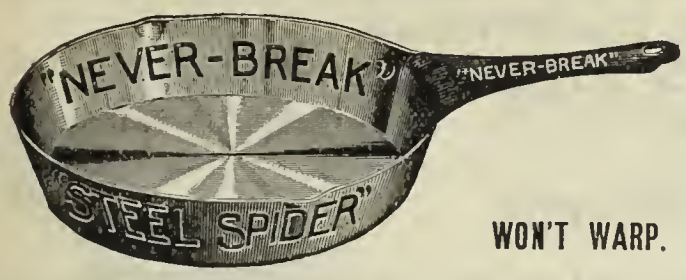
Fitting closely around body of child, and with high protection in front, it gives perfect protection to the child, and prevents soiling of table-cloth and carpet.

MANUFACTURERS FULL LINE

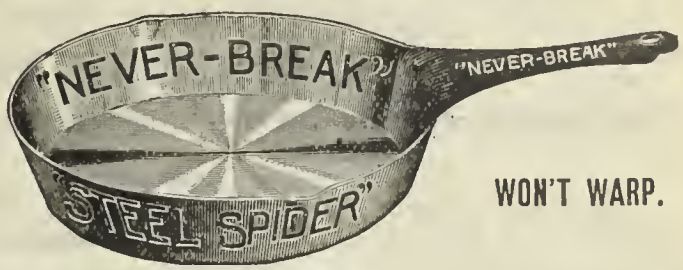
STAMPED, JAPANNED AND PLAIN TIN WARE.

KEEN & HAGERTY, SOLE MANUFACTURERS, **BALTIMORE.**

"NEVER-BREAK" STEEL HOLLOW WARE



WON'T WARP.



WON'T WARP.

STEEL SPIDERS, GRIDDLES, KETTLES, MASLINS, ETC.

Send for Catalogues of all our lines and Discounts.

THE STANDARD FOR WEIGHT, FINISH AND PRICE.

IMMEDIATE SHIPMENTS GUARANTEED.

The Bronson Supply Co., New York and Cleveland.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

Write us for Catalogue and Prices.

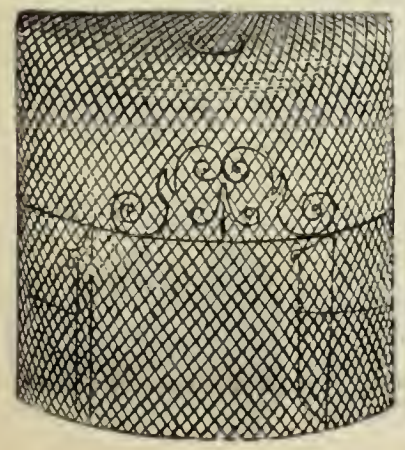


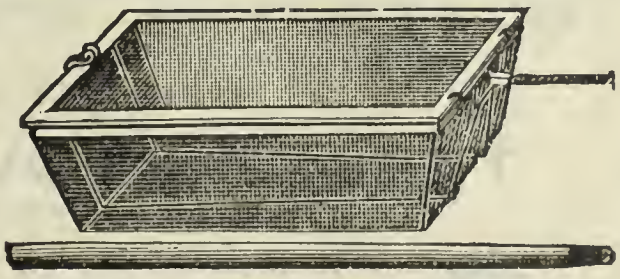
ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.

THE FRED. J. MEYERS MFG. CO., HAMILTON OHIO,



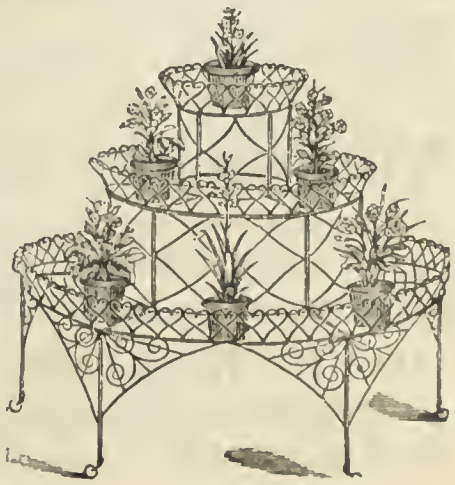


MANUFACTURERS OF

Wire Guards, Corn Poppers, Flower Stands, Sieves, Screens, Bank and Office Wire Work, Railing of every description.

FIRST CLASS GOODS. LOW PRICES.

F. J. MATTISON, Eastern Agt., 69 Beekman St., N. Y.



NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. / Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

You ought to.

A GREAT many merchants are using

Ladd's Discount Book.

Every day adds to the number of those who highly esteem this valuable work. Very many people both in America and abroad have commended it highly as a time-saver and money-earner. It is positively

Accurate, Saving many times its cost in preventing errors.

Rapid, - - Saving much valuable time, and "Time is Money."

Practical, As proved by its constant use by those who would not now do without it.

The cost is small, the book will last for years, you can depend upon the results without proving.

A great many bright people are using LADD'S DISCOUNT BOOK, and

You ought to.

Regular Edition, $3.00 } Sent postpaid upon receipt of price by
Double Indexed, 4.00 }

DAVID WILLIAMS,
Publisher and Bookseller,
96-102 Reade Street, - New York

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,
74 Beekman Street, New York.
Foundry, Perth Amboy, N. J.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

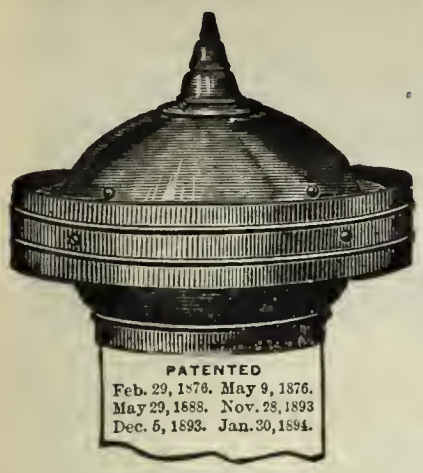


W. R. OSTRANDER & CO.,
204 FULTON STREET, NEW YORK.
Manufacturers of
Speaking Tubes, Whistles, Elbows, Ear Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.



THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers original patterns

MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

LIVE IN JERUSALEM ?

It don't make any difference where you live ; we allow all freight charges on

RUTLAND STOVE LINING.

IT FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

"FIRESTONE"

Has proved i self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

SELF LUBRICATING

Rotary Screw Ventilators



WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

48 Cortlandt St., New York

Send for illustrated circular.

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

215 North 2d St., - - - Philadelphia.

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works.

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.

Established 1866.

EDWARD L. CALELY,

STOVE PATTERNS

TO ORDER.

945 Ridge Ave., PHILADELPHIA, PA.

CENTRAL PATTERN WORKS,

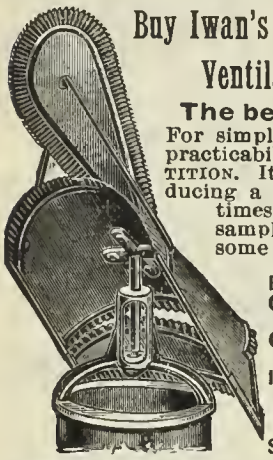
Stove and Furnace Patterns a specialty. Work first-class under a full guarantee.

E. C. HALTEMAN, Proprietor, Dayton, O

NICKEL PLATING OUTFITS.

ZUCKER & LEVETT & LOEB CO.
8 TO 14 GRAND STREET,
NEW YORK, U. S. A.

SEND FOR CATALOGUE OF
NICKEL & ELECTRO-PLATING
SUPPLIES & POLISHING MATERIALS.



Buy Iwan's Volcano Revolving Ventilating Chimney Top

The best in the World

For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.

FOR SALE BY
Berger Bros., Phila., Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Cincinnati Stamping Co., Cincinnati, O.
Illinois Roofing & Supply Co., Chicago, Ills.

IWAN BROS.
Sole Mfrs., Streator, Ills.



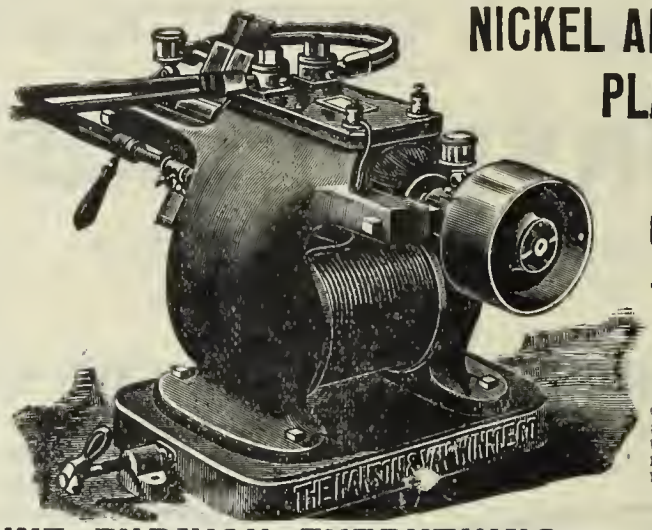
THE DIAMOND THIMBLE IS THE BEST.

Manufactured by
S. CHENEY & SON
MANLIUS, N. Y.

ESTABLISHED 1850. INCORPORATED 1891

The Hanson & Van Winkle Co.,

MANUFACTURERS OF



NICKEL AND ELECTRO PLATERS' MATERIAL.

Nickel-Plating Outfits
From $20 upward.

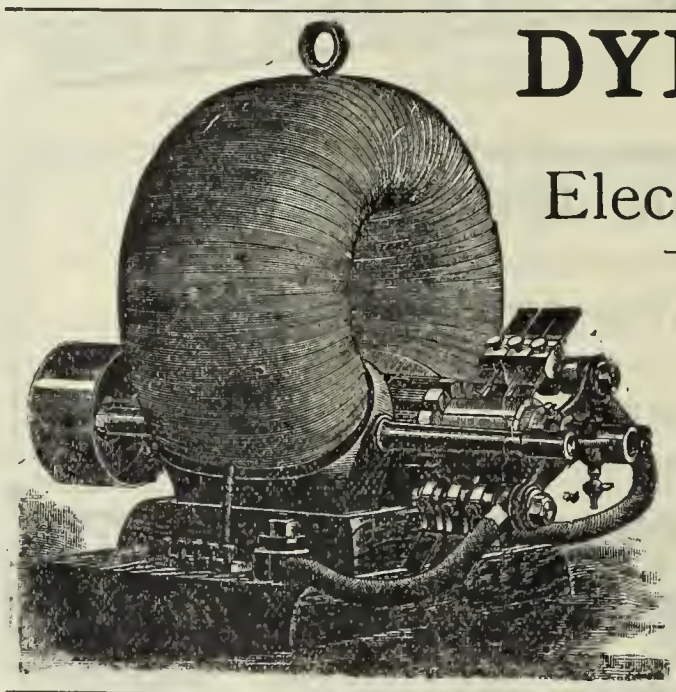
DYNAMO-ELECTRO MACHINES
For all purposes.

The New H. & V. W. Dynamo Machine.
In sizes from No. 1 to No. 5.
FROM $100 TO $800.

These machines will be placed on 30 days' trial with responsible parties, and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.

WE FURNISH EVERYTHING.

219-221 Market St., Newark, N. J.
81 Liberty St., New York.
85-87 South Canal St., Chicago, Ill.



DYNAMOS
—FOR—
Electro-Plating.

SIMPLE, DURABLE and EFFICIENT.

The Best Machine Made.
Satisfaction Guaranteed.

—THE—
Eddy Electric Mfg. Co.,
Windsor, Conn.



Patent applied for.

The Lightning Skate Sharpener.

With Key and Wrench Combined.

Is the Greatest Little Seller of the Age.

Every skater will buy one when shown. It is only necessary to get two or three out in the boys' hands to set the whole town wild for them.

They can be had of any of the following wholesale houses:

T. M. Roberts Supply House, Minneapolis.
Lewis Bros. & Co., Montreal, Quebec, Can.
Kerr & Robertson, St. John, N. B.
Roberts Stove & Hardware Co., Denver.
The Henry Sears Company, Chicago.
Wells & Nellegar Company, Chicago.
Hatch Cutlery Company, Buchanan, Mich., and 97 Chambers St. N. Y.
Hammacher & Delius, Exporters, N. Y. City.
Puritan Cycle Works, Portland, Me.
A. F. Shapleigh Hdw. Co., St. Louis, Mo.
The Strichter Hdw. Co., Reading, Pa.
G. J. Morton, Yarmouth, N. S.
Barrett Hdw. Co., Joliet, Ill.
Rath & Stone, 57-60 Wilshire Bldg., Cleveland, Ohio.
Butte Hdw. Co., Butte, Mont.
Wyeth Hdw. & Mfg. Co., St. Joseph, Mo.

Manufactured by
SANDWICH NOVELTY CO., Sandwich, Ill.

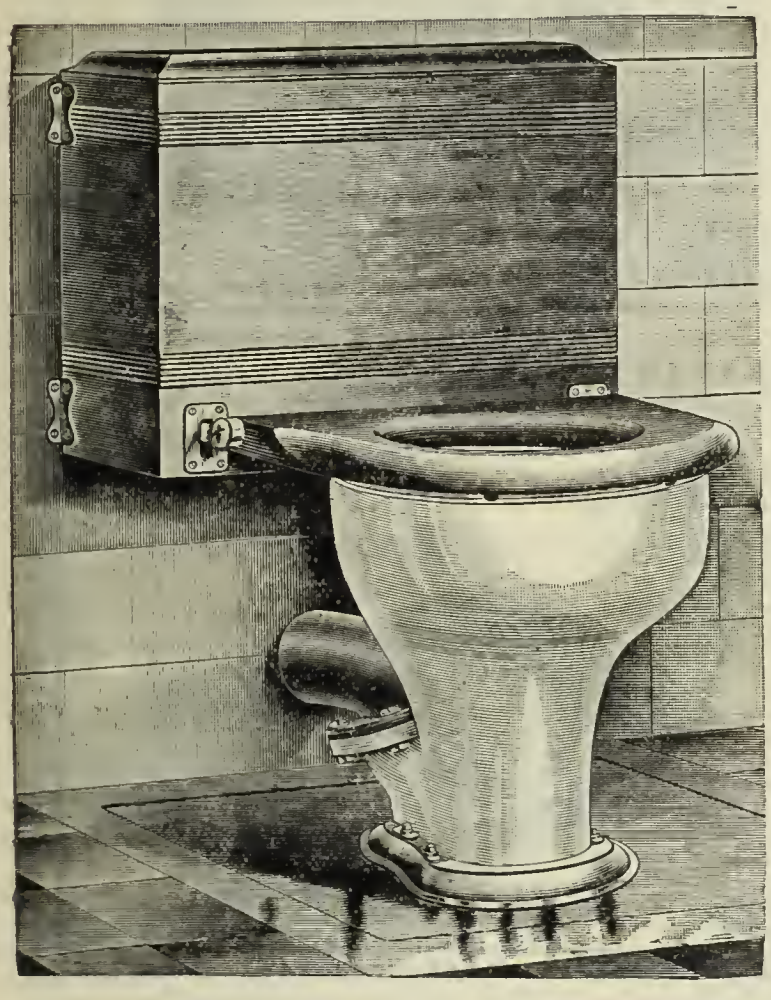
The Influence of Trifles.

Jefferson was fond of telling a story which illustrates in a forcible manner the importance that absurdly insignificant matters may sometimes assume. When the deliberative body that gave the world the Declaration of Independence was in session, its proceedings were conducted in a hall close to which was situated a livery stable. The weather was warm, and from the stable came swarms of flies that lighted on the legs of the honorable members, and, biting through the thin silk stockings then in fashion, gave infinite annoyance. It was no uncommon sight, said Jefferson, to see a member making a speech with a large handkerchief in hand, and pausing at every moment to thrash the flies from his thinly protected calves. The opinion of the body was not unanimous in favor of the document, and, under other circumstances, discussion might have been protracted for days, if not weeks, but the flies were intolerable. Efforts were made to find another hall, free from the pests, but in vain. As the weather became warmer the flies grew worse, and the flapping of handkerchiefs was heard all over the hall as an accompaniment to the voices of the speakers. In despair, at last some one suggested that matters be hurried so that the body might adjourn and get away from the flies. There were a few mild protests, but no one heeded them, the immortal declaration was hurriedly copied, and, with handkerchiefs in hand fighting flies as they came, the members hastened up to the table to sign the authentic copy and leave the flies in the lurch. Had it not been for the livery stable and its inmates there is no telling when the document would have been completed, but it certainly would not have been signed on the Fourth of July.—*Exchange.*

—It is common for a man to bring up his niece, but what do you think of a fellow who raises his ante.—*Siftings.*

PURITAN WASH DOWN WATER CLOSET.

Best Closet Yet Produced for Either Public Places or Private Houses.



In presenting this Water Closet Apparatus to Architects and Plumbers and those interested in Sanitary Plumbing, will say that our aim has been to **Improve the Quality, Simplify the Construction and Reduce the Cost of Fitting in Place,** and we feel confident that we have done all this in the present Apparatus, and more too, **as it will discharge more matter, keep cleaner with less water and make less noise in the operation** than any Water Closet Apparatus now on the market.

The Closet is especially well adapted for Fire Proof Structures, as the Soil Pipe may be run above the floor, either behind or on the face of the finish. Another very good feature—stoppage can only take place in the bowl (where it can be reached from the top). Anything that passes this point will not lodge in the Soil Pipe.

These Closets are made of Vitreous Earthen Ware—that is, an absolutely non-absorbing material, warranted not to craze. Each Closet is stamped with a Bull's Head, our trade-mark.

The tank is provided with a cover finished to match. This cover deadens the noise, prevents fouling by dust and also prevents malicious persons from getting at or throwing anything into the tank.

The tank is worked either by hand action or seat action.

The distance from top of tank to finish of floor is 2 feet 6½ inches. From face of wall to front of Closet, 2 feet 1¾ inches. Depth of seal in Closet 2¾ inches.

SEND FOR CATALOGUE.

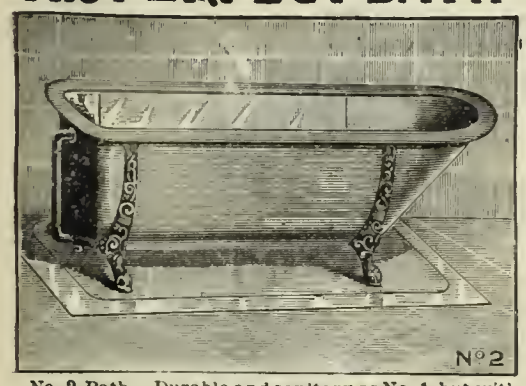
MANUFACTURED BY

DALTON-INGERSOLL COMPANY

169-175 High St. & 55-61 Purchase St. (Ft. Hill Square),

BOSTON, MASS.

The PERFECT BATH.



No. 2 Bath. Durable and sanitary as No. 1, but with less variety.

INDESTRUCTIBLE

THE STEEL CLAD BATH.

INEXPENSIVE.

Common sense demands a sanitary bath, economy an inexpensive one, good taste one which can be decorated to harmonize with its surroundings. The **Steel Clad Bath** (copper lined) offers these advantages. It is also durable, and has, if desired, connected overflow and waste pipe. All metal except rim. No wood to harbor vermin or disease. Don't buy an imitation—get the **Steel Clad.** Send for catalogue.

For sale by all jobbers and plumbers and the

STEEL CLAD BATH CO. OF NEW YORK,

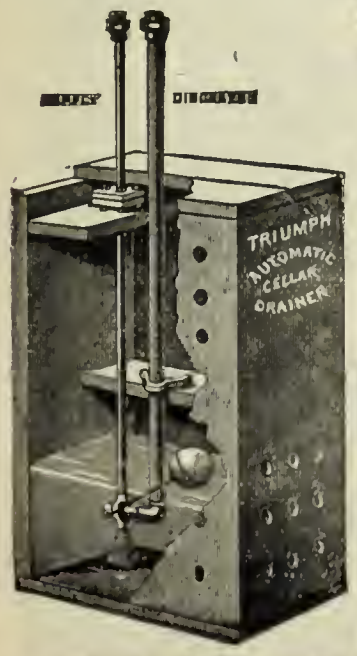
447 to 453 W. 26th St., New York City.

W. C. TRAGESER, President.

STEEL BATH MFG. CO.,

Detroit, Mich.

GEORGE BOOTH, President.



A SURE CURE

—FOR—

WET CELLARS.

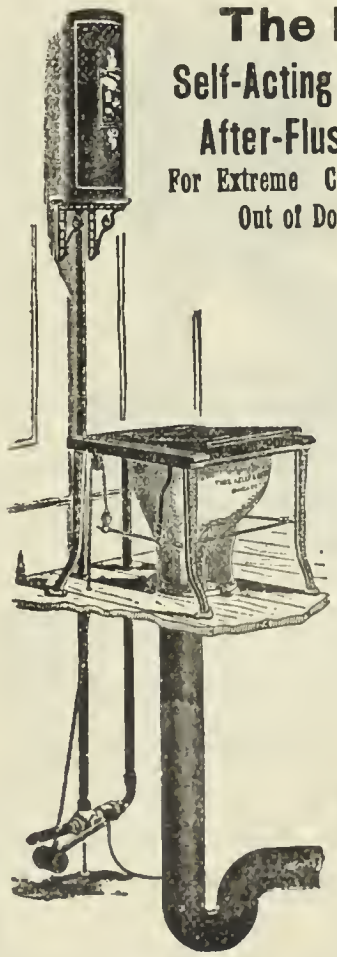
The Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

FRIEDENWALD BROS.,

216 N. Holliday St., Baltimore, Md., Sole Mfrs

Pat. May 19, '85. Pat. May 26, '85. Pat. July 14, '85. Pat. Aug. 8, '86. Pat. Nov. 23, '86.



The Kelly Self-Acting Frost-Proof After-Flush Closet.

For Extreme Cold Places and Out of Door Work.

When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

—SEND FOR CATALOGUE.—

Thomas Kelly & Bro.,

124 Franklin St., Chicago,

Manufacturers of Permanent Plumbing Goods.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

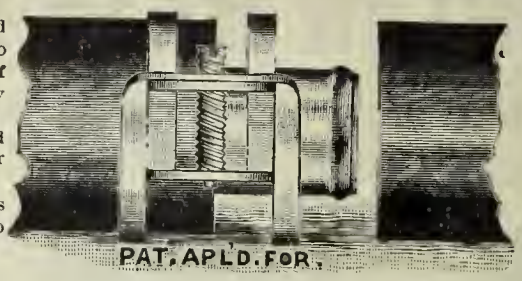
No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

They will not blow out in the heavies wind, and will beat the heaviest irons faster than any man can use them.
Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

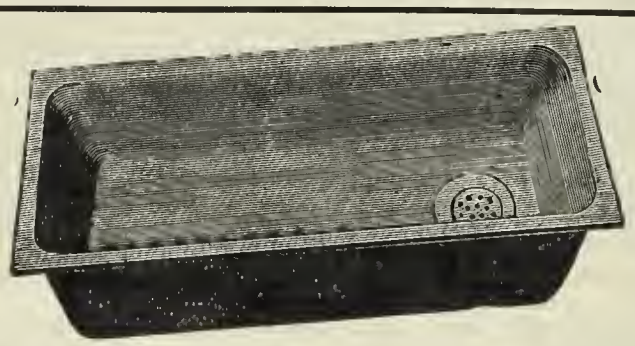
One Band and Tube do the work of two of any other make a knife and screwdriver being al the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust. Sold by Jobbers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.



Columbus and New Era

Wrought .· Steel .· Sinks.

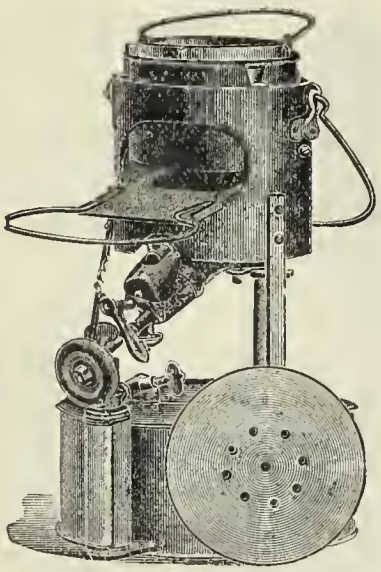


Both good, either the best. Cannot, will not break. In the end cheapest.

The Kilbourne & Jacobs Man'fg Co.,

Columbus, Ohio, U. S. A. **Mfrs., write for Prices and Discounts.**

No. 2 BONANZA Combination Furnace.



For Plumbers and Tinners.

Price $6.50 combination, including Lead Pot and casing. Price $6.00 for Plumbers alone. Galvanized iron tank with brass top; my patented rubber pump handle; a double burner, burns inward from both sides; hottest fire ever produced from gasoline; melts 10 pounds of lead in five minutes; beats 5-pound coppers in three minutes; cannot blow out. One dollar off cash with the order. Look out for "ad." of Bonanza No. 1 and No. 3. Write for catalogue.

M. L. HULL, Cleveland, O.

Principles and Practice of Plumbing.

By S. Stevens Hellyer. With illustrations. 294 pages, price $1.25. Sent on receipt of price by

DAVID WILLIAMS, . Publisher & Bookseller,

96-102 Reade St., New York.

Drawn Steel Sinks

Anchor and Diamond Brand

MANUFACTURED BY

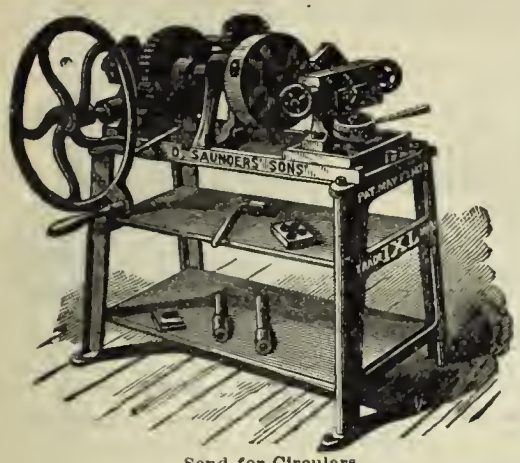
L. Wolff Manufacturing Company,

GENERAL OFFICES, 93 W. Lake Street, Chicago.

Write for Illustrated Price-List Just Published.

D. SAUNDERS' SONS,

MANUFACTURERS OF THE ORIGINAL



TRADE **I. X. L** MARK

Pipe Cutting and Threading Machine.

Beware of imitations. None genuine without our Trade-Mark and Name.

STEAM AND GAS FITTERS, HAND TOOLS.

Also, Patent Wheel Pipe Cutters.

AS SHOWN BY THE CUT.

Pipe Cutting and Threading Machines for Pipe Mill Use a Specialty.



27 Atherton St., Yonkers, N. Y.

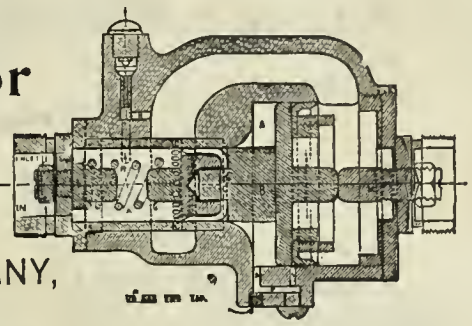
Send for Circulars.

W. G. Taafel's

Pressure Regulator

PATENTED.

Send for Circulars, Price-Lists and Conditions for Placing.



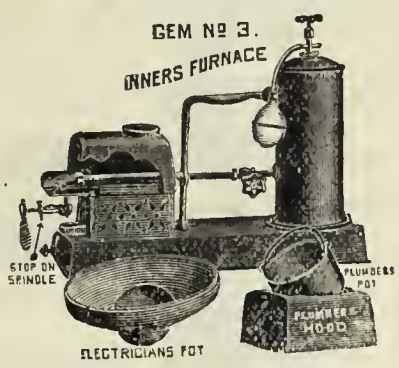
NEWARK REGULATOR COMPANY,
Newark. Ohio.

WORKED OUT

of doors or on roofs in all kinds of weather. If you can't do this with the

BURGESS GEM NO. 3,

bring it back and get your money. Have you as much faith in it as that? If so, TRY ONE.



All have a cast iron cylindrical burner, so arranged that solder cannot clog them.

Manufactured by **Burgess Soldering Furnace Co.,** COLUMBUS, OHIO.



THE

Acme

Soldering F'c'e

Has cast iron return burners so arranged that solder cannot clog them, burns from both sides, flames meet in the center, making the hottest fire ever produced from Gasoline, with a saving of one half the fuel. Melts lead and heats coppers at the same time.

THE HENRIE MFG. CO., - Xenia, O.

EVERY FURNACE GUARANTEED.

ROOFING SLATE.

OUR BANGOR UNION, ALBION & MAMMOTH VEIN QUARRIES
PRODUCE THE FINEST SLATE IN PENNSYLVANIA & VERMONT

HAND SHAVED BANGOR SLATE BLACK BOARDS

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS

AULD & CONGER, 100 EUCLID AVE., CLEVELAND, OHIO.

SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

43 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

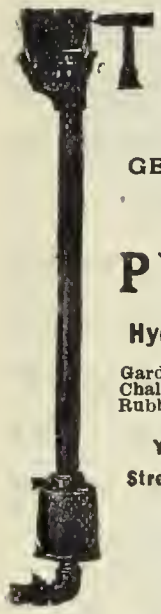
DAVID WILLIAMS,

PUBLISHER,

96-102 Reade St., New York.



W. & B. DOUGLAS,



Middletown, Conn.

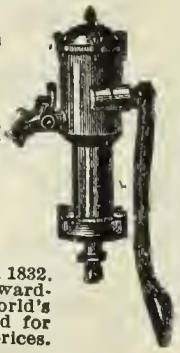
Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON
156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS



Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.

THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.

It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.



COONEY, SEINER & CO.,

Successors to

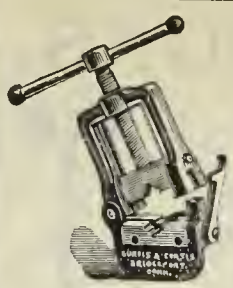
MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

3-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.



The Curtis Pipe Vise.



The Reversible Ratchet Drill.

CURTIS & CURTIS,

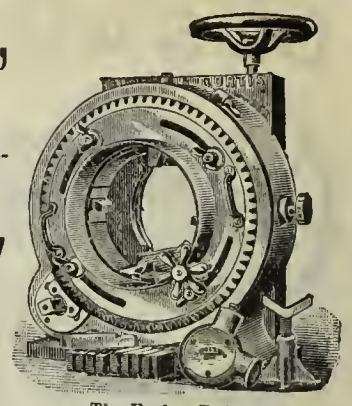
56 Garden St., Bridgeport, Conn.

We make a specialty of manufacturing all kinds of

TOOLS or MACHINERY

Used in Working Wrought Iron Pipe.

Send for new 52-page Illustrated Catalogue.



The Forbes Patent Die Stock.

ZERO VALVE CO.,

212 Seneca St.,
Buffalo, N. Y.

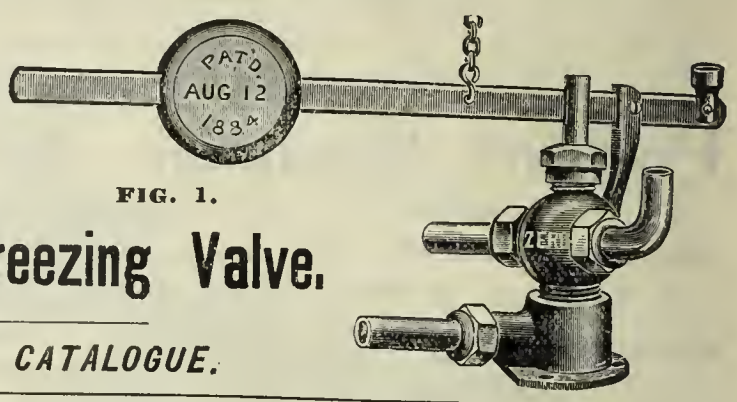
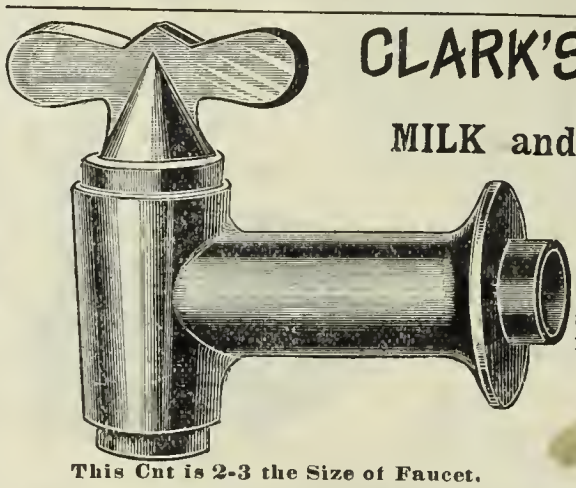


FIG. 1.

Zero Anti-Freezing Valve.

SEND FOR CATALOGUE.



CLARK'S NEW FAUCET

—— FOR ——

MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

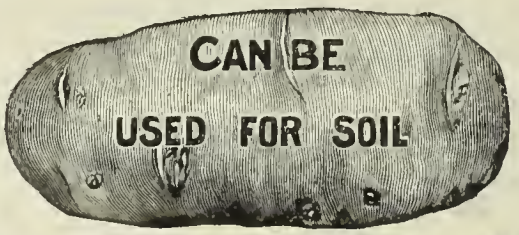
This Cut is 2-3 the Size of Faucet.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.

A RAW POTATO



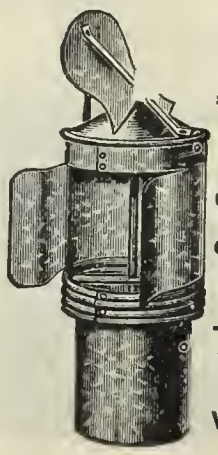
Up to Date Plumbers Use

Bailey-Farrell Mfg. Co.'s Prepared Soil and S. S. S. Solder.

Special Price for Trial Lots.

Pittsburgh, Pa.





REVOLVING CHIMNEY CAPS,

Galvanized Iron.

These Caps revolve on heavy glass bearings, and are made from No. 26 iron. All sizes; cheapest and best.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets. Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted Leader, cheapest and best in the market. Sheet Iron Piping, Stove Pipe and Fittings of every description.

GENERAL GALVANIZING TO ORDER.

THE JERSEY CITY GALVANIZING CO.,

Manufacturers and Jobbers in

GALVANIZED MATERIAL OF EVERY DESCRIPTION.

Works, Jersey City. Store, 112 John St., New York.

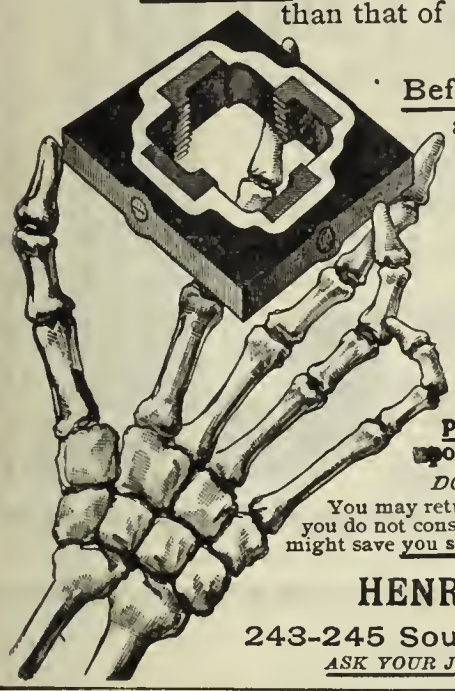
SEND FOR CATALOGUE.

Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

1

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

A sample One-inch "Skeleton" Pipe Die either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you 62 cents, and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

HENRY B. PANCOAST & CO.,

243-245 South 3d Street, Philadelphia, U, S. A.

ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.

TRIMO PIPE WRENCH

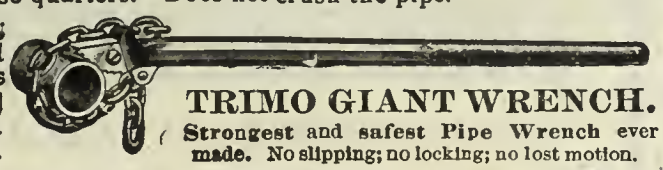


Forged Steel.

All Parts Interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

The chain holds securely; cannot fall out even if used upside down. Readily releases when desired. Solid forged head. Fine quality of tool steel. Interchangeable gripping jaws.



TRIMO GIANT WRENCH.

Strongest and safest Pipe Wrench ever made. No slipping; no locking; no lost motion.

TRIMO COMBINATION WRENCH. FOR NUTS AND PIPE.



TRIMONT MFG. CO., Roxbury, Mass,

PECK BROS. & CO.,

Fine Sanitary Goods.

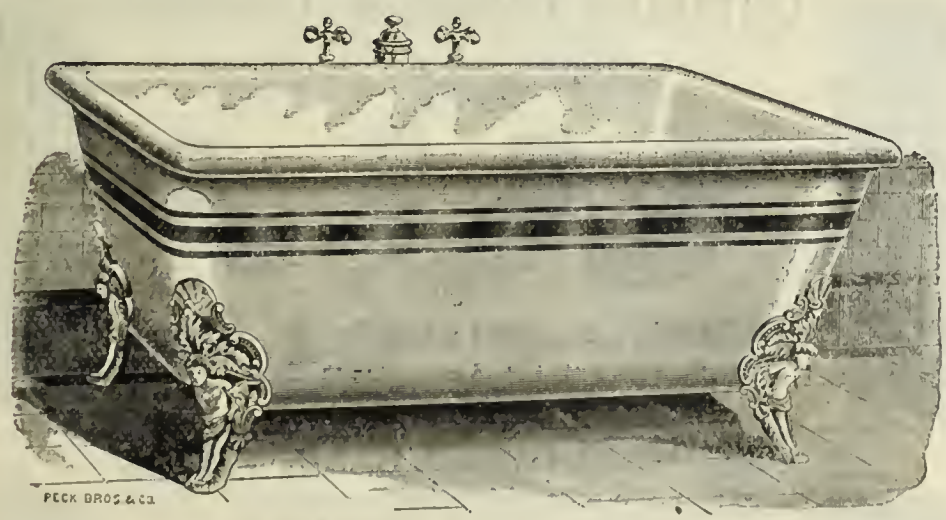


Fig. 198, Catalogue of 1893.

47 Cliff St., NEW YORK. 259 Wabash Ave., CHICAGO. 127 Chestnut St., NEW HAVEN, CT. 65 Oliver St., BOSTON.



The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating burners.** It is a modern, perfected apparatus warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adjustable burners. Send for catalogue.

C. M. KEMP MFG., CO.,

BALTIMORE.



DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.

The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discounts

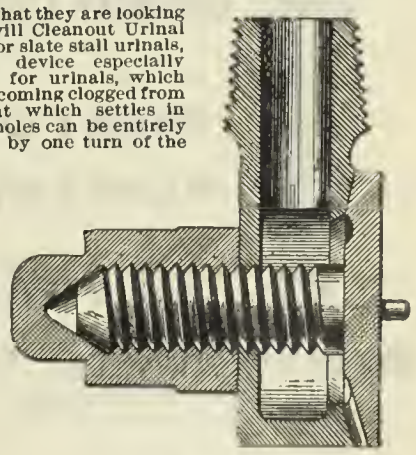
MADE BY,

THE DAY MFG. CO.

Detroit, Mich., U. S. A.

Plumbers, Builders, Architects!

Just what they are looking for. Savill Cleanout Urinal Spray for slate stall urinals, a new device especially adapted for urinals, which upon becoming clogged from sediment which settles in tits or holes can be entirely cleaned by one turn of the nut.



(Patent applied for.)

FOR SALE BY

SAVILL, WALLS & CO.,

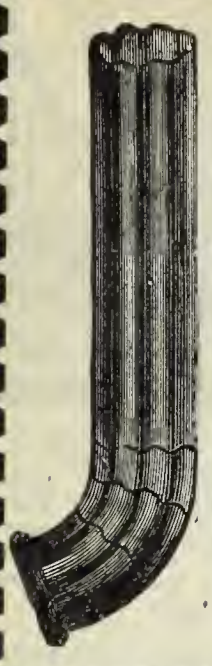
Dealers in Plumbers' Supplies,

1229 and 1231 Budden Street, - PHILADELPHIA.

Write for circulars.



OUR ADJUSTABLE STOCKS and DIES are universally acknowledged to be the **BEST!** We also make all our Tools on the same principle, of the **Best Material** and **Workmanship**, and always with a view of *time and labor saving in their use.*



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

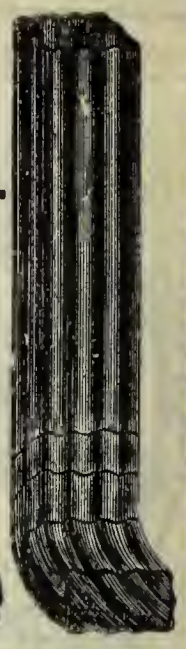
EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**







W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.



BROUGHTON'S

PATENT

SELF CLOSING

BASIN COCK

EVERY ONE WARRANTED

Send for Circulars.

Stebbins Manufacturing Co., Brightwood, Mass.

SOLE MANUFACTURERS.

EAVES TROUGH HANGERS.

PROUDMAN BROS.,

MERIDEN, CONN.

— PRESIDENT CLEVELAND needn't worry about the Mosquito territory. New Jersey is able to take care of herself.

Eave Trough.



Conductor Pipe.



EAVE TROUGH, CONDUCTOR PIPE, &c.

DO YOU WANT the very best? If so address the manufacturers and receive their prices. They can save you money, as well as furnish you with superior goods, made on greatly improved machinery.

THE KANNEBERG ROOFING CO.,

CANTON, OHIO.



Corrugated Expanding Conductor

OF GALVANIZED IRON AND COLD ROLLED COPPER.





JAMES A. MILLER & BRO.,

129 and 131 South Clinton St.,

CHICAGO.



USE "OUR OWN" BASIN PLUGS.

No other lettering on them.

SAMPLE DOZEN ASSORTED $1.

HANDSOMELY NICKELED. BEST QUALITY STOCK

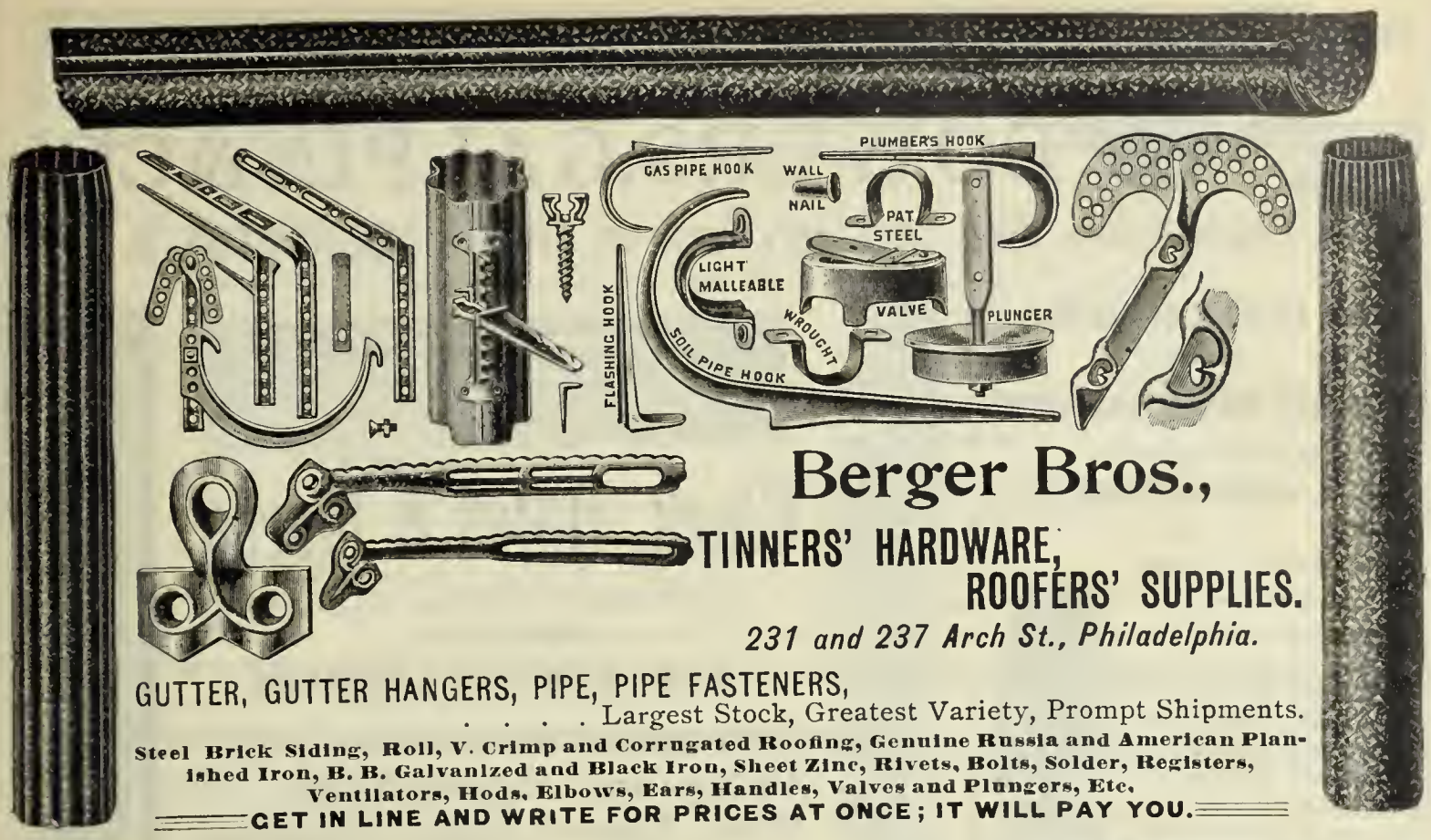
H. O. CANFIELD

MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.





Berger Bros.,

TINNERS' HARDWARE, ROOFERS' SUPPLIES.

231 and 237 Arch St., Philadelphia.

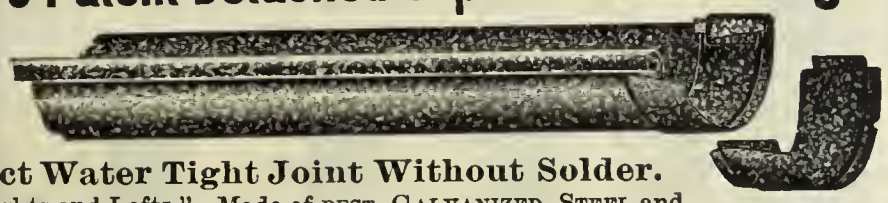
GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,
. . . . Largest Stock, Greatest Variety, Prompt Shipments.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Hods, Elbows, Ears, Handles, Valves and Plungers, Etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.

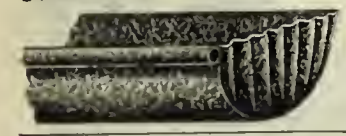
Holton's Patent Detached Slip Joint Eave Trough.

10 FEET LONG.



A Perfect Water Tight Joint Without Solder.

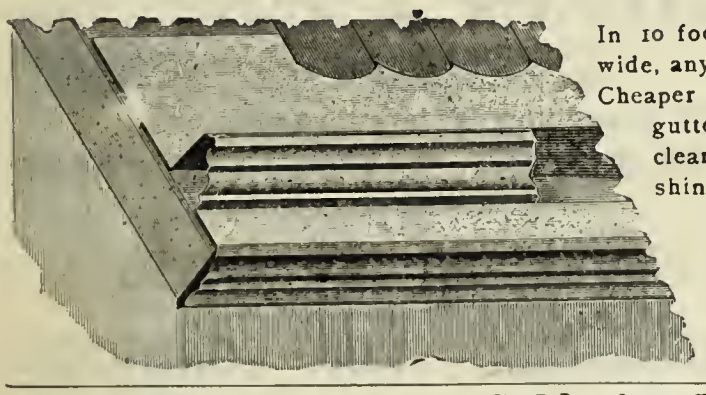
"No rights and Lefts." Made of BEST GALVANIZED STEEL and TIN. Also HOLTON'S PATENT "SOLID" END PIECE. PLAIN and CORRUGATED CONDUCTOR PIPE. ELBOWS, SHOES, HANGERS, ETC.



☞ We are headquarters for Copper Conductor and Gutter Copper is not as expensive as you think.

The Niles Mfg. Co., Niles, Ohio.

Sims' Ornamental Roof Gutter.



In 10 foot lengths, 12 in. to 30 in. wide, any fall desired, will not leak. Cheaper than wood or any other gutter. One continuous piece, clear up under slate or tin or shingle. Write for prices.

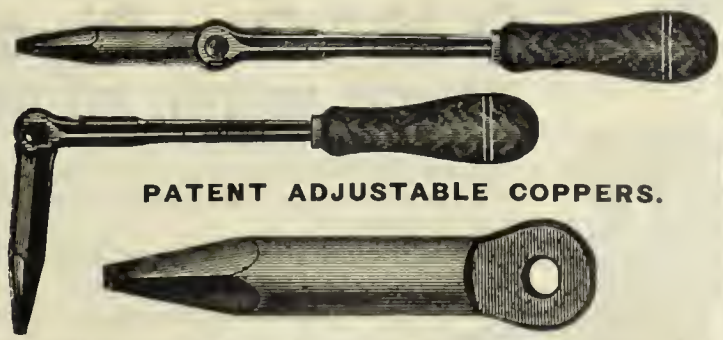
The

Sims Mfg. Co.,

Newark, O.

Covert Pat. Adjustable Soldering Irons and Coppers

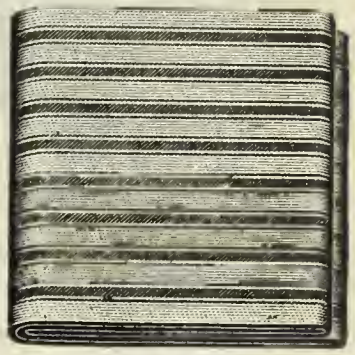
It is a complete tool in every respect, and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.



☞ A sample of ⅞ in. soldering iron will be sent by mail, free of postage to any address, on receipt of sixty cents (60c.).

FOR SALE BY ALL GENERAL HARDWARE AND PLUMBERS' SUPPLY HOUSES.

COVERT MFG. CO., - West Troy, N. Y.



It requires considerable skill to make a good wiped joint—considerable skill, also, to make a proper **Wiping Cloth.** And while one cannot manufacture a wiped joint, we can and do make and sell a perfect **Cloth.**

One that will outwear two of the ordinary kind.

One that you can buy cheaper than you can make.

Send us 12 cents for a sample (any size; for any kind of a joint) and see if the "Columbia" Wiping Cloth is not a model of its kind, then send 62 cents for six of any size by mail. See that each one is stamped "Columbia."

THE

J. W. Chamberlain Co.,

Plumbing and Steam Fitting Specialties,

BANGOR, - - MAINE.

— FUSSY: "Sir, the howling of your dog annoys me dreadfully."

McGUFF: "It do, do it! Maybe yez want me to get a trained baste that can play on the flute!"



BOWERS, GALPIN & CO.

Eaves-Troughs, Gutters, Miters, Trough-Ends, Conductors, Ridging. **BINGHAMTON, N. Y.**

THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR

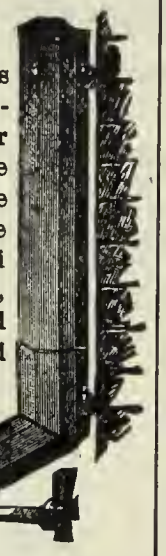
MANUFACTURED BY THE

S. S. S. CONDUCTOR CO.,

LIMITED

168 Lacock Street,

ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

Galvanized, Kalameined or Leaded.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.



TINNERS, ATTENTION! GREAT REDUCTION IN PRICE.

Best Eave Trough Fastener in the World.

Yapp Patent Champion Fastener

MANUFACTURED BY

WALTHER & CHRISTMAN,

Successors to CHAS. BODY,

269 to 275 Central Ave., Cleveland, Ohio

Send for sample and price-list

COLWELL LEAD COMPANY,

Centre St., and 681 Sixth Ave., Cor. 39th St., New York.

Lead Pipe, Sheet Lead, Shot,

Plumbers', Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order

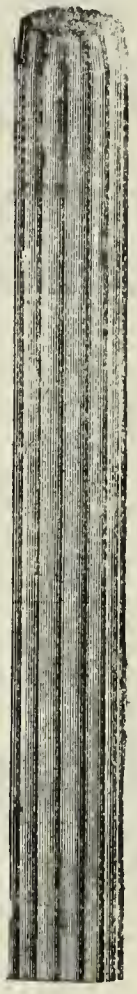
LEATHER AND RUBBER

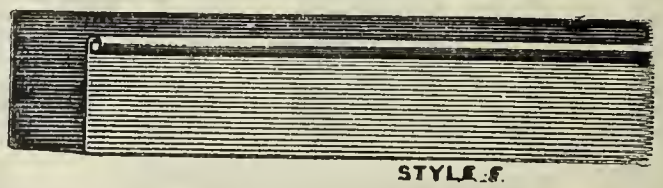
WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.





STYLE S.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

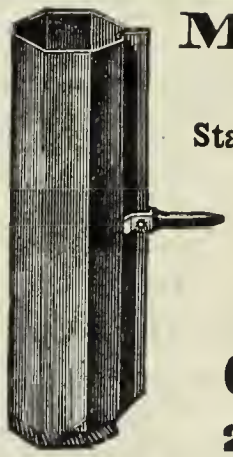
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,



(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

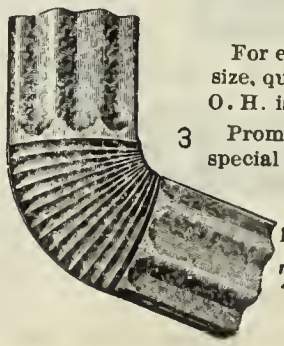
206 Robinson St., ALLEGHENY, PA.

The "O.H." One Piece

PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

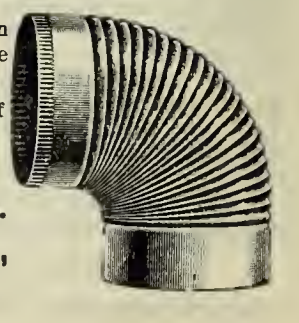
(PATENTED OCT. 25, 1892.)



For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.



For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.

SPECIALTIES.

BRIGHT TIN PLATE.
CUMMEY'S ANTI-PINHOLE.
TERNE PLATE.
ALDERLY EXTRA QUALITY.
PENNSYL OLD METHOD, Treble Coated.
GILBERTSON'S OLD METHOD, Treble Coated.
Sheet Copper.—Brazier's Cold Rolled & Polished.
CRAIG SHEET STEEL.
COLD ROLLED SHEET IRON.
" " " SOFT STEEL.
CORRUGATED IRON.
" CONDUCTOR PIPE.
SPIRAL PIPE. REGISTERS.
ROOFING PAPER, No 9.— 500 Square Feet per Roll.
" " No 13.— 800 Square Feet per Roll
ROOFING PAINT.
" TIN IN ROLLS.
100 Square Feet.
20 in. and 28 in. Wide.
Painted One Side.
ASBESTOS FIRE PROOF SHEATHING PAPER.
PECORA ROOFING CEMENT.
PLASTERING WIRE.

GUMMEY, SPERING & CO.,
PHILADELPHIA.

REMEMBER—At the same address, with larger stock than ever.
MERRY'S OLD METHOD Roofing Plate.
STAMPED, SQUARED AND GUARANTEED.
GEORGE E. MERRY, Successor to John Merry & Co.,
535 to 547 West 15th Street, New York.

NEW CASTLE
AMERICAN
BRIGHT TIN AND TERNE PLATES
Made at our Extensive Works
direct from
LAKE SUPERIOR ORES.
Equal to the "Best in the World,"
If you don't believe it send for samples.
New Castle Steel and Tin Plate Co., New Castle, Pa.

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.
AMERICAN SHEET IRON COMPANY,
—MANUFACTURERS OF—
SHEET IRON AND SHEET STEEL,
Including Light Black Plates for Tinning, Stamping, &c.
ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

BLACK DIAMOND
EXTRA TRADE MARK COATED
ROOFING PLATES
are thoroughly AMERICAN
In every respect. One trial will convince you of their superiority over anything you have ever used Send for sample and thoroughly test it. Manufactured by HENRY W. SCATTERGOOD.
Black Diamond Tin Plate Works, 51 & 53 Laurel St., Phila.

MAPLE SYRUP CAN
and SAP BUCKET STOCK.
We are now prepared to quote for December and January shipment.
M. & L. A. OSBORN, - - - CLEVELAND O.

— CHAPPIE: "Miss Jessie cries for the least little thing in the world."
Ethel Knox: "I didn't know she was as fond of you as all that."—*The World.*

— "DID you make a hit with that red tennis blazer of yours down on the farm?"
"Did I? It struck the bull's eye the first time I wore it."

PHELPS, DODGE & CO.,

11 Cliff St., N. Y.

Tin Plate, Pig Tin, Sheet Iron, Sheet Zinc, &c.

PHELPS' TREBLE COATED ROOFING.

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade.

TIN AND IRON SHOW CARDS.

110 John St., - New York.

ALAN WOOD COMPANY,

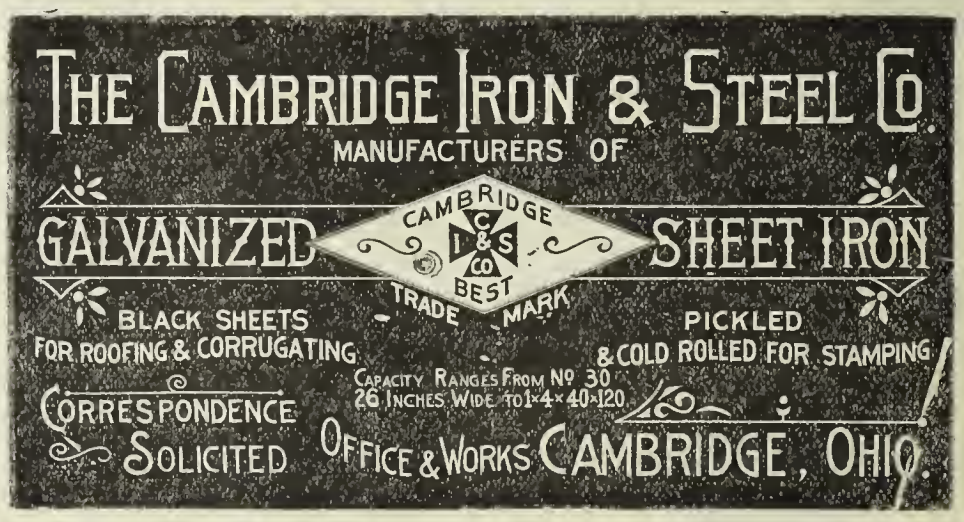
MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.



ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.

Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

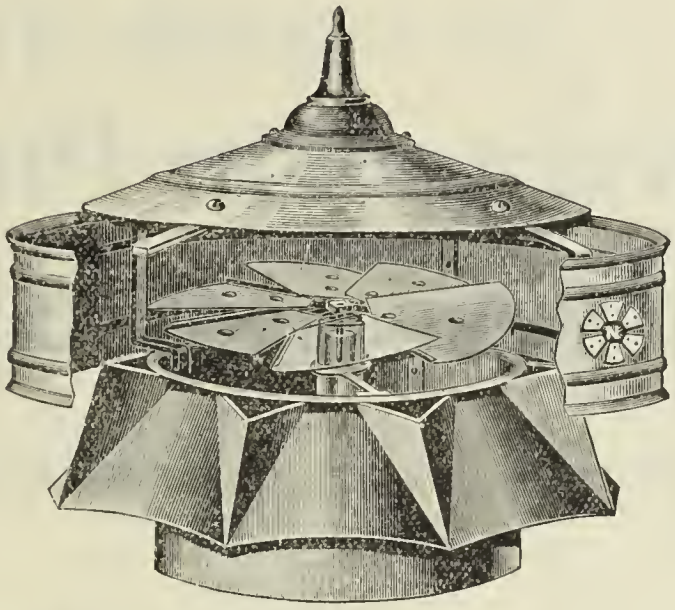
108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

THE NASH VENTILATOR.

REVOLVING,

DURABLE,

EFFICIENT.



DUST-PROOF,

NOISELESS,

Self-

Lubricating.

P. B. CALVERT & CO., - PHILADELPHIA.

—AGENTS:—

FITZ, DANA & CO., Boston, Mass.
MEURER BROS. CO., Brooklyn, N. Y
SIDNEY SHEPARD & CO., Buffalo, N. Y.
LYON, CONKLIN & CO., Baltimore, Md.
J. H. CHESLEY & CO., Washington, D. C.
J. M. & L. A. OSBORNE, Cleveland, Ohio.
KNISELEY BROS., Chicago Ill.

JOHN DUNLAP COMPANY'S

SPECIAL BRAND ROOFING PLATES.

SUPERIOR GRADE.

I DUNLAP'S DOUBLE IPPED C

Or I X.

PALM OIL PROCESS.

EVERY BOX GUARANTEED. PITTSBURGH, PA.

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. BRIDGEPORT, OHIO.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices.

Brooklyn, N. Y.

PHILLIPS' ROOFING EXTRA HEAVY COATED. Guaranteed 35 Pound Coating.

"BOSTON" ROOFING. HEAVY SPANGLED TERNE. Guaranteed 20 Pound Coating.

NATIONAL (Dark) TERNES. (WORCESTER GRADE.) Guaranteed 10 Pound Coating.

THE PHILLIPS TIN PLATE CO., Philadelphia.

☞SEND FOR SAMPLE AND NEW TARIFF PRICES.

A Famous Firm's Origin.

The following interesting story of the origin of the famous English firm of blacking manufacturers, Day & Martin, is extracted from an article published some time ago in *Tinsley's Magazine:* About one hundred and fifty years ago, when wigs were worn, there lived a maker of perukes at Doncaster. One day a soldier came to the shop to be shaved, and mentioned in the course of conversation, for our barber was cheerful and chatty, that he was obliged to return to his regiment, stationed in York, on foot, as he was without the necessary money for coach fare. The barber had known poverty in his day and was pleased to help a neighbor, so he either gave or lent His Majesty's man the money for the coach. Unlike most good Samaritans, this one was rewarded at once. The soldier returned to York in due course, and wrote to Mr. Martin, the hairdresser of Doncaster, with the returned loan, many sincere thanks, and the recipe for a certain preparation which he said he had long used with excellent effect upon the boots of his officers. Mr. Martin tried the manufacture of this material and found it successful ; he then turned his thoughts to London, where a friend of his, Mr. Day by name, carried forward a flourishing business in Tavistock street, then a rather more fashionable part of town than at the present time. Day & Martin decided that the soldier's recipe was good, and began making their famous blacking from it, and thus were laid the foundations of one of the most splendid and flourishing businesses which London knows.

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

——MANUFACTURERS OF——

SHEET METAL ROOFING, SIDING AND CEILING

——OF ALL DESCRIPTIONS FROM——

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.

Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.

Factory, 113 to 133 Soulard Street, ST. LOUIS, MO.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size. CONCAVE

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. **LITTLEFORD BROS.,** SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati.

Bright Charcoal Tin Plates.

Coke Tin Plates.

A Full Assortment of Sizes.

ALSO

20 x 28 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	LILY—Stamped and Squared.
IC	DYFFRYN,
IC	WORCESTER.
200 lbs.	WORCESTER.
IC	W T R—Stamped.
200 lbs.	W T R.
IC	P T L.
IC	DEAN
200 lbs.	DEAN.
IC	PETREL.
200 lbs.	PETREL.
IC	ALYN.
IC	BAAN.
IC	MANSEL.
IC	ALBAN.
200 lbs.	ALBAN.
190 lbs.	ALBAN.
200 lbs.	CAWDOR.
190 lbs.	CAWDOR.

14 x 20 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F—Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	W T R—Stamped.
100 lbs.	W T R.
IC	P T L.
IC	DEAN.
100 lbs.	DEAN.
IC	PETREL.
100 lbs.	PETREL.
100 lbs.	CAWDOR.
IC	BAAN.

WASTER ROOFING.

ICW	20x28 GWERNEN.
ICW	" W T R.
200 lbs. W	" ALBAN.
190 lbs. W	" ALBAN.
180 lbs. W	" DYFFRYN.

SOLDER—The reduction in Pig Tin has made prices much lower.
RUSSIA SHEET IRON (Genuine)—The duty has been reduced, and prices are lower than last year. No. 8 to No. 16 inclusive, sheets 28x56 inches.

BRUCE & COOK,

190 Water St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. Harvey's Patent Cleaned Black Iron.

Painted Corrugated Roofing and Siding.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

Standard Books

—ON—

FOUNDRY PRACTICE.

The Encyclopedia of Founding and Dictionary of Foundry Terms,

used in the practice of molding. Together with a description of the tools, mechanical appliances, materials, and methods employed to produce castings in all the useful metals and their alloys, including brass, bronze, steel, bell, iron and type founding, with many original mixtures of recognized value in the mechanic arts. Also aluminum, plating, gilding, silvering, dipping, lacquering, staining, bronzing, tinning, galvanizing, britannia-ware, German silver, nickel, soldering, brazing, ores, smelting, refining, assaying, etc. By SIMPSON BOLLAND, Author of "The Iron Founder," "The Iron Founder" Supplement. 12mo.: cloth.....**$3.00**

The Pattern Maker's Assistant

Embracing lathe work, branch work, core work, sweep work and practical gear constructions, the preparation and use of tools, together with a large collection of useful and valuable tables. Sixth edition. By JOSHUA ROSE, M. E.; illustrated with 250 engravings; 324 pages: cloth.....**$2.50**

Modern Molding and Pattern Making.

A practical treatise upon pattern shop and foundry work. By JOSEPH P. MULLIN, M.E.: 257 pages; cloth; illustrated. **$2.50**

Iron and Steel Founding.

Illustrated with 39 diagrams. By C. WYLIE. Second edition, revised and enlarged: 324 pages; 8vo; cloth... .....**$2**

The Practical Brass and Iron Founder's Guide.

A treatise on brass founding, molding, the metals and their alloys, etc. By JAMES LARKIN, late conductor of the brass foundry department in the Penn Works, Philadelphia. A new revised and greatly enlarged edition. Contents: Among the most important and entirely new sections of this edition of this valuable and popular book are the following: Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to Other Metals; Casting Iron and Other Metals Upon Lace, Embroideries, Fern Leaves and Other Combustible Materials; Some Modern Bronzes. In one volume; 12mo; 400 pages.....**$2.50**

American Foundry Practice.

Treating of loam, dry sand and green sand molding, and containing a practical treatise upon the management of cupolas and the melting of iron. By THOMAS D. WEST, practical iron molder and foundry foreman. Fully illustrated. Eighth edition, revised. 408 pages: cloth..... **$2 50**

The Iron Founder.

A comprehensive treatise on the art of molding, including chapters on core-making, loam, dry sand and green sand molding, also crystallization, shrinkage and contraction of cast iron and a full explanation of the science of pressures in molds, added to which are formulas for mixtures of iron, tables, rules and miscellaneous information. By SIMPSON BOLLAND. Illustrated with over 300 engravings. 12mo, cloth....**$2.50**

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings, wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. Illustrated with over 200 engravings; 400 pages; 12mo: cloth..... ...**$2.50**

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96-102 Reade St., - New York.

IS IT RIGHT?

Is it right to presume that the metal workers of America do not know the difference between common galvanized iron and good galvanized iron? We don't think so.

Would it be right to take advantage of that ignorance, even if it did exist? We don't think so.

Is it wise to conduct a business on that sort of a basis? We don't think so.

Taking advantage of other people's lack of expert knowledge is mighty poor business. Very few of us but have to take other people's words for things we are not wholly familiar with. Are we "fair game" for imposition because we depend on other folks' honesty? As a matter of fact, metal workers do know the difference between poor iron and good iron. They may be imposed upon once in a while because they believe in the dealer's honesty and do not watch him, but sooner or later they will find out the imposition, and then the dealer will be sure to lose their trade forever.

A dealer or manufacturer who sells inferior goods on the representation or with the understanding that they are first-class, is not a safe man to deal with. If he will sell a single sheet of iron that way, look out for him on a car load.

When we sell "Star Best Bloom," we guarantee it perfectly flat, full weight without variation, and absolutely true to gauge. It's the best grade of galvanized sheets we know how to procure. Doubtless, unscrupulous persons can occasionally sell inferior sheets at the price of the "Star." Doubtless they would make a little bigger profit on that one sale, but the big profits that result in lost trade are not so very profitable after all.

For a certainty of quality and an absolute guarantee of grades, address

MERCHANT & CO., Inc.,

PHILADELPHIA, CHICAGO, NEW YORK, BROOKLYN.

Hicks' Guide FOR Builders,

Comprising an easy, practical system of Estimating Materials and Labor for Carpenters, Contractors and Builders.

A comprehensive guide to those engaged in the various branches of the building trades.

By I. P. HICKS.

160 Pages, - 114 Illustrations.

Bound in Cloth, Price, - $1.00

This book presents to the trade, first, an easy, practical system of estimating materials, in concise form for reference. In the next place is given the average day's work of all kinds, and the average rates on which to figure in almost every detail of building construction.

Material and Labor, including Lumber, Carpentry Work Masonry, Plastering, Hardware Painting, etc., are among the principal divisions These in turn are illustrated and ably treated under numerous sub-divisions, showing step by step the entire work of estimating, contracting and building, together with the best and most practical methods of doing the work.

This is followed by a section given to the Geometrical Measurements of Roof Surfaces with numerous illustrations and examples. It embraces a new and simple system of framing curved roofs, also the simplest methods of roof framing of every description, with practical examples thoroughly illustrating nearly every conceivable form of roof and showing many points never before presented.

The volume also contains a chapter on Mitering Planceers, Moidings, etc., illustrating and describing how to make, in an easy, practical manner, many joints which are the source of no little trouble and annoyance on the part of the workman.

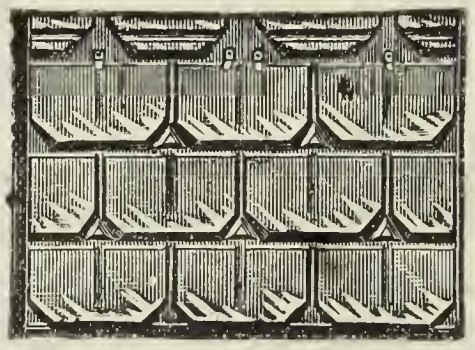
SENT POST-PAID BY

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade St., N. Y.

THE FAVORITE METAL SHINGLE

EASTLAKE



MONTROSS PATENT.

Gothic and Diamond Tile.

Unequaled for beauty and excellence.

SEND FOR CIRCULAR.

W. J. Burton & Co., - - - - Detroit, Mich.
Montross Metal Shingle Co., - - Camden, N. J.
E. Van Noorden & Co., - - - Boston, Mass.

BEWARE! OF INFRINGMENTS.

..Purchase only the..

Genuine Pressed Steel Brick.



PATENTED APRIL 5th 1887.

Corrugated Steel CEILINGS

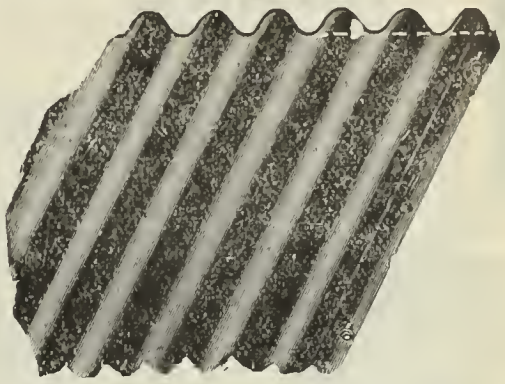
THE PENN IRON ROOFING AND CORRUGATING Co LIMITED.

For Catalogue, Samples and Prices. 23rd & HAMILTON Sts PHILA, PA. U.S.A.



Roof AND Ridge Coverings

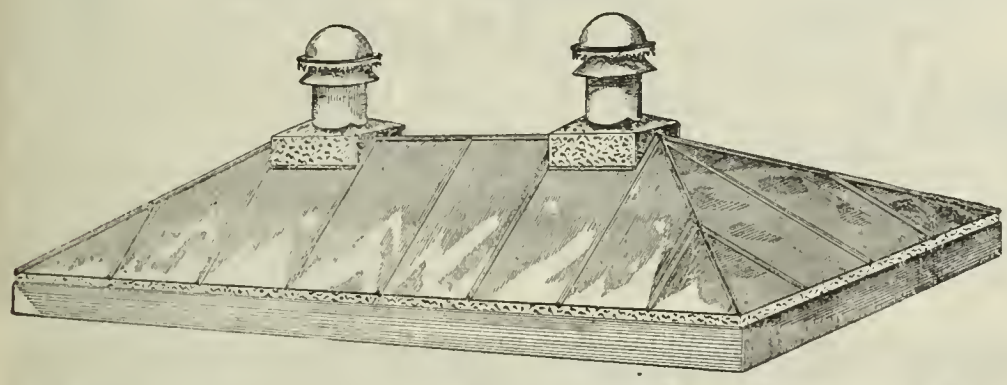
"The Life of an Iron Roof, or How Long Will It Last?" Our little book sent free.



As made by us ready to put on, can be applied by any Roofer, Tinner, Carpenter or Builder, require no skilled or high-priced labor and when in position are guaranteed to be more durable and to give greater satisfaction than any other roofing material, at much less cost.

The Cincinnati Corrugating Co.,
Box 314, Piqua, Ohio.

For Houses, Barns, Factories, Warehouses, Granaries, Sheds, Etc.



Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.

Buy Plain and Corrugated Conductors and Single and Double Beaded Eave Troughs, all in 10 ft. lengths; also Brick Siding, Corrugated Roofing, Cornices, &c., of

ALLEN'S CORRUGATING WORKS,
422 and 424 W. Randolph St., CHICAGO, ILL.

You can get everything in the line of Sheet Metal Goods from us.

PRICES WAY DOWN.

Steel Roofing, Corrugated Iron,

Galvanized Steel Eave Trough, Corrugated Expanding Conductor, Galvanized Cornice, Ornamental Crestings, Finials, Etc.

DOWN! DOWN! GO PRICES. WRITE US QUICK.

J. H. ELLER & CO., Office, 194 E. Fifth St., CANTON, OHIO

Defy Fire and Time

WITH OUR

Steel Roofing,
Steel Ceilings, (Patented)
Corrugated Iron, Conductor Pipes,
Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,
Office and Works, Wheeling, W. Va.
Office and Warehouse, 474 Laflin St., Chicago.
Office and Warehouse, 81 Fulton St., New York.

The Meaning of Horse-Power.

The unit measurement of mechanical power was introduced by James Watt and called a "horse-power." How this name originated is well told in the *Magdeburger Zeitung*. One of the first steam engines built by Watt was to furnish the power for the pumps in the brewery at Witbread, England, which up to that time was supplied by horses. The contract called for as much power as furnished by a strong horse, and in order to get as powerful an engine as possible the brewer ascertained the amount of labor performed by a horse by working an exceptionally strong horse for full eight hours without a stop, urging the animal with a whip until it was exhausted, and thereby succeeded in raising 2,000,000 gallons of water. Considering the hight of the reservoir this labor represents the present unit of a "horse-power," that is, the lifting of 168¾ pounds to a hight of about 3 feet per second. This result, however, was obtained by exceptional methods and should not be considered the basis of measurement of mechanical power. Actually, the power of the average horse is barely sufficient to lift 65 to 70 pounds 3 feet high per second.

— HE: "Even if you women had the ballot you would simply cast your votes for the handsomest candidates."

SHE: "Well, if we did, there would not be any more pug-nosed, bull-necked toughs in high places."—*National Standard.*

—FATHER (impressively): "Suppose I should be taken away suddenly, what would become of you, my boy?"

Irreverent Son: "I'd stay here. The question is, what would become of you?"—*West Chester Critic.*

—WIFE: "You were out last night."

Husband: "You are mistaken. I was in just seven dollars."—*Dansville Breeze.*

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.

AMERICAN ROOFING CO.,

Mention this paper. **ST. LOUIS and CINCINNATI.**



The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S. FIRST & WASHINGTON STS. JERSEY CITY, N.J.

FRIEDLEY & VOSHARDT, 194 & 196 Mather Street, **CHICAGO, ILL.**



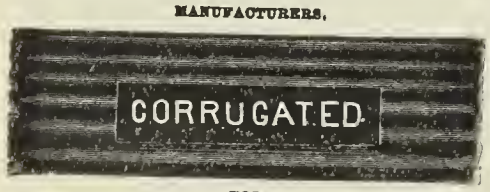
MANUFACTURERS OF
Sheet Metal, Zinc and Copper Ornaments
FOR
Interior and Exterior Work, Steel Ceilings, Statuary, &c.
Send for our new 1894 Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.

James A. Miller & Bro.,

129 and 131 South Clinton St.,
CHICAGO,

MANUFACTURERS.



FOR
ROOFING AND SIDING.

Send for Circular and Prices.

— GRACE. "Are you sure she loves you?"

Dick: "Positive. She said she would rather have me save my money than buy her a Christmas present.—*Harlem Life.*

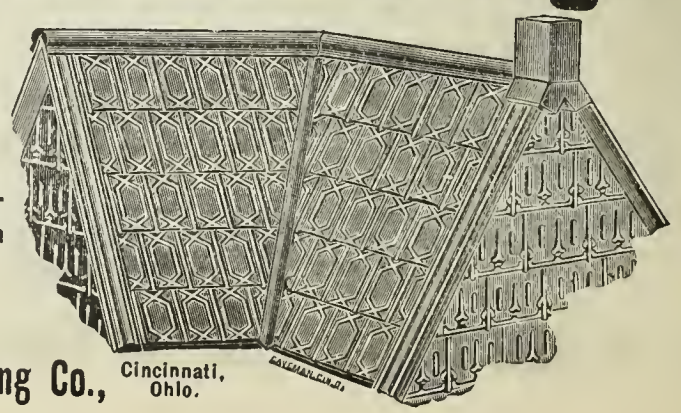
— OFFICE BOY: "Man outside with fire in his eye!"

Editor: "The Lord will provide. Bring him in and we will warm by him!"

Send for a descriptive circular, with sample pages, of the METAL WORKER PATTERN BOOK. Even if you are not ready to buy, you want to know just what kind of book it is and how it would help in your work. DAVID WILLIAMS, Publisher, 96 - 102 Reade Street, New York.

THE REAGAN Metallic Shingle

Absolutely water proof.
Easily applied.
Cheap.
Will last a lifetime.
Can be laid by any one.
Superior to slate and unsurpassed in appearance when laid.
Write for terms.



—o—

The Cincinnati Stamping Co., Cincinnati, Ohio.

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.

THE CANTON STEEL ROOFING Co.

CANTON, OHIO.

MF'GRS OF Best Quality Standing Seam, Corrugated and Crimped.

TIN PLATE, GALVANIZED IRON, PAINTS etc.

STEEL ROOFING AND SIDING. WRITE FOR OUR 1894 CATALOGUE, PRICES etc.

EAVES TROUGH, CONDUCTOR PIPE HANGERS etc.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

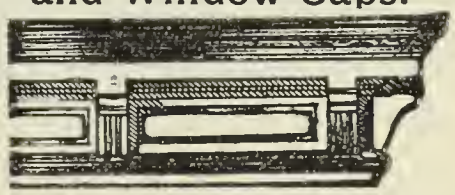
Mention THE METAL WORKER.

JAMES A. MILLER & BRO.

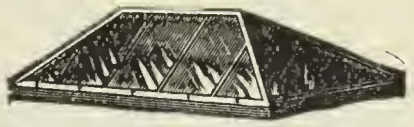
129 and 131 S. Clinton St., Chicago.

MANUFACTURERS

Galvanized Iron Cornices and Window Caps.



SHEET METAL SKYLIGHTS



Owing to increased facilities (secured to enable us to fill our World's Fair contracts), we can make specially low prices on Skylights.

CORRUGATED { *Iron Roofing.* *Conductor Pipes.*

See other Advertisement in this Paper.

HOLTON IRON ROOFING CO.

ROOFING CEILING &c.

SIDING NEW LISBON, O.

AGENTS WANTED EVERYWHERE





WORLD'S FAIR AWARD.

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., Chicago and Niles, O.

THE NEW TARIFF ON TIN

Enables us to **Reduce** the price of our

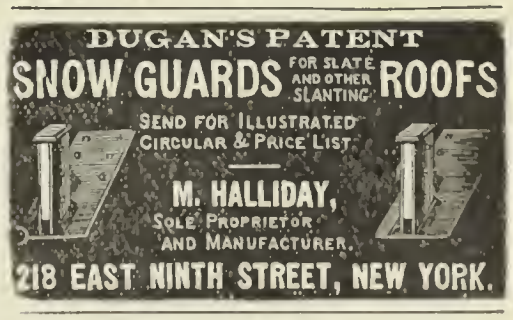
Metal Slates and Victoria Shingles.

Quotations based on the new duty furnished on request, and samples sent free if desired.

Cortright Metal Roofing Co.,

Broad and Hamilton Sts., Philada., Pa.
134 Van Buren St., Chicago, Ill.





JOHN SANBORN,

Dealer in Metals,

and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead.

217 WATER STREET,

Near Beekman Street, NEW YORK

THE ROOT & BARRON

ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer,
PALMYRA, NEW YORK.

JOHN D. EMACK,

Roofing Slate,

SLATE BLACK-BOARDS.

Betz Building, Philadelphia, Pa.

SALEM NAIL CO.

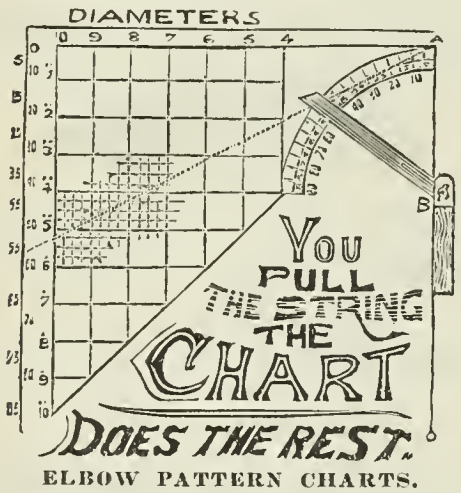
O. Nelson, 292 Pearl St., New York.

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds.



ELBOW PATTERN CHARTS.

Quick method. Easy to learn. Good to have. Over 1000 sold. 50c. by mail.

A. L. BURTIS, Lockport, N. Y.

— Sir Robert Rawlinson, who has just taken the chair of president of the British Institution of Civil Engineers, and who is now overwhelmed with honors and dignities of every kind, commenced life as a stonemason. Passing one day through Chorley street in London a short time ago with the Lord Chief Justice, he asked the latter, pointing to a step in front of a house, "How do you think that step is set?"

"How should I know?" exclaimed Lord Russell, laughingly.

"I do," was Sir Robert's reply, "for I set it myself."

— Professor: "What degree of cold can a man stand?"

Student: "I don't know, sir. I am not acquainted with any of the Boston girls yet."—*Detroit Free Press.*

—Country Minister: "There was a stranger in church this morning."

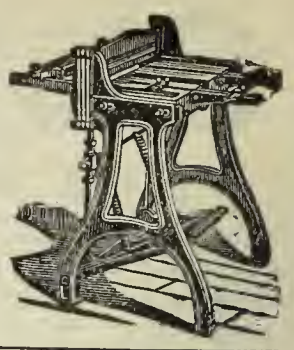
Wife: "What did he look like?"

Minister: "I did not see him."

Wife: "Then how do you know there was a stranger in the congregation?"

Minister: "I found a dollar bill in the collection."—*Truth.*

TINNERS' MACHINERY AND SUPPLY CO.,



SUCCESSORS TO

HIBBERD & SPINNER,

9 CLIFF STREET, - NEW YORK CITY.

Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery. Presses, Dies and Can Makers' Tools.

FULL LINE OF SUPPLIES.

PATENT AUTOMATIC CAN BODY

SEAMERS.

COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.

218 New St.,

W. J. GORDON, PHILADELPHIA, PA.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, - - EASTON, PA.

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC.

QUARRIES, BANGOR, PA.

NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE

Kitchen Sinks,
Laundry Tubs,
Washstand Tops,
Marbleized Shelves,
Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also **Mantels.**

FAIRHAVEN, VERMONT

SEND FOR CATALOGUE.

When Painting Roofs,

When Painting Stacks or Boiler Fronts,

use Dixon's Silica-Graphite Paint and you will never regret it. Roofs well painted have not required repainting in 10 to 15 years. Graphite paint is equally useful for wood or metal. Send for circulars.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

The English and American Mechanic:

AN EVERY-DAY HAND-BOOK FOR THE WORKSHOP AND THE FACTORY.

CONTAINING

Several Thousand Receipts, Rules and Tables Indispensable to the Mechanic, the Artisan and the Manufacturer.

By B. Frank Van Cleve.

A new, revised, enlarged and improved edition, edited by Emory Edwards, M.E.

ILLUSTRATED WITH EIGHTY-FIVE ENGRAVINGS.

In one volume, 500 pages, 12mo, closely printed, containing a vast body of information of value to all practical men. Elegantly bound in scarlet cloth, gilt. Price **$2.00.**

SENT POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS, Publisher and Bookseller. 96-102 Reade Street, New York.

Ferracute Machine Co.,

BRIDGETON, N. J., U. S. A.,

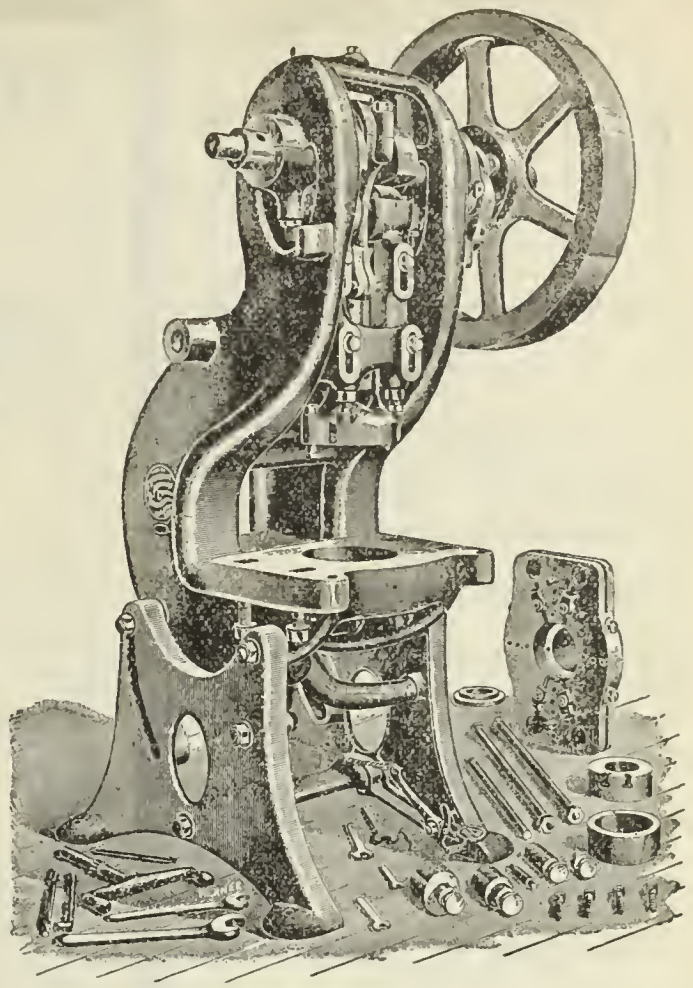
MANUFACTURERS OF

FOOT AND POWER

PRESSES, DIES

And other SHEET METAL TOOLS

OF ALL KINDS.



Please send for Illustrated Price-Lists describing **300 kinds** Presses, every kind of Dies, Tinners Tools, Solder Apparatus, &c., for the manufacture of **Cans, Tinware, Sheet Iron Goods, Lamps, Gas Fixtures and other Brass Goods, Silverware, Hardware and other Iron Goods of every kind.**

Six sizes of New "Style C" Inclinable Presses, Heavy, Handsome, Durable and Very Popular.

GOODWIN'S

Improved Book-keeping and Business Manual,

Revised and Enlarged Edition. BY J. H. GOODWIN. Forty-first Thousand.

The author of this book has sought among bookkeepers of all degrees of ability and business men in various kinds of business for points which would be likely to prove of value either to a bookkeeper or to a business man. In these interviews he has been permitted to inspect the books of some of the largest business houses of the country, and to learn the methods employed by them. The work therefore embodies not only the results of his own experience, but that of at least a hundred other bookkeepers of the highest standing in the profession, from whom there have been received and are here given *a great variety of valuable points.*

Printed in two colors, on an excellent quality of paper, and is substantially bound in dark, rich cloth. Sent, post-paid, on receipt of price ($3.00) by

DAVID WILLIAMS, PUBLISHER AND BOOKSELLER,

96-102 READE STREET, NEW YORK.

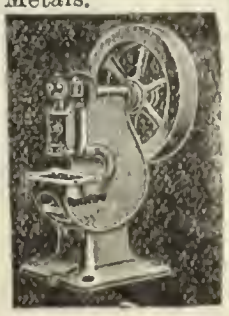
THE TOLEDO MACHINE & TOOL CO.,

MANUFACTURERS OF

Power Punching Presses, Drop Presses, Trimming Presses, Stamping Presses Riveting Presses, Embossing Presses, Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.



Send for Catalogue now being printed.



The Toledo Mach. and Tool Co.

Superior and Oak Sts.. Toledo, O.



THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstrat on is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

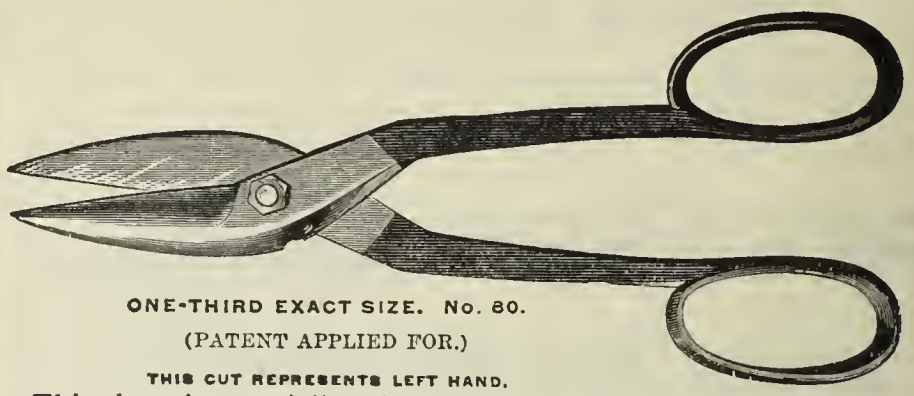
ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade Street, New York.

The "Lyon" Shear.



ONE-THIRD EXACT SIZE. No. 80.

(PATENT APPLIED FOR.)

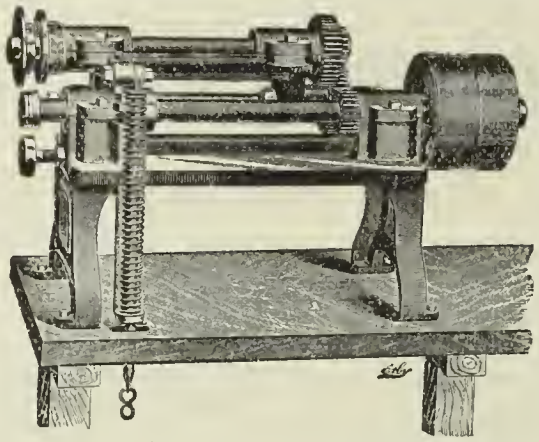
THIS CUT REPRESENTS LEFT HAND.

This shear is especially adapted to **Cornice and Tin Work,** being so constructed that **Scrolls, Circles,** &c., can be **perfectly** and **accurately** cut, which **cannot** be done with the ordinary shear.

LYON, CONKLIN & CO., BALTIMORE.

For Sale by

Fitz, Dana & Co.
Brown & Wales, } Boston, Mass.
Austin & Doten,
Meurer Bros. Co., Brooklyn, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.
The McIntosh-Huntington Co., Cleveland, O.
The F. H. Lawson Co., Cincinnati, O.
Sargent, Greenleaf & Brooks, Chicago, Ill.
W. S. Phelps & Son, Dayton, O.
O'Dell Hardware Co., Greensboro, N. C.
Stratton & Terstegge, Louisville, Ky.
Fones Bros. Hdw. Co., Little Rock, Ark.
Peden & Co., Houston, Texas.
Tanner & Sullivan, Indianapolis, Ind.
Manogue-Pidgeon Iron Co., Memphis, Tenn.
Phillips-Buttorff Mfg. Co., Nashville, Tenn.
C. S. Mersick & Co., New Haven, Conn.
Demmler Bros. } Pittsburg, Pa.
McClure & Co., }
G & A. Bargamin, Richmond, Va.
Excelsior Mfg. Co., } St. Louis, Mo.
A. Geisel Mfg. Co., }
Townley Stove Co., Terre Haute, Ind.
W. A. List & Co., Wheeling, W. Va.
Ed. Strauss, Waco, Texas.
C. A. Conklin Mfg. Co., Atlanta, Ga.



—OUR—

POWER TRIMMING MACHINE

is designed to trim the edges of **Sheet Metal Boxes, Rim Covers, Blacking Boxes, Lard Pail Covers, Ladle Bowls, Dipper Bowls and Similar Work. Will Trim Covers up to 1½ inches in depth and 15 in. diameter.**

—MANUFACTURED BY—

C. A. CROSBY & CO.,

176 & 178 So. Clinton St., Chicago, Ill., U.S.A.,

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears, and Special Machinery for Can, Soap and Boiler Makers, and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Wire Goods, Brass Goods and all Hardware Novelties.**

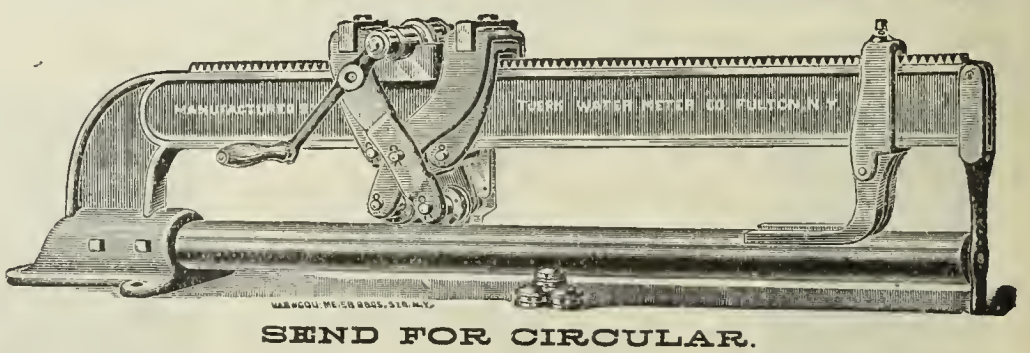
Special Attention to Dies of Every Description.

WORK GUARANTEED THE BEST.

Write for Prices and Our New 200-Page Catalogue.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.

TUERK WATER METER CO.'S GROOVER.



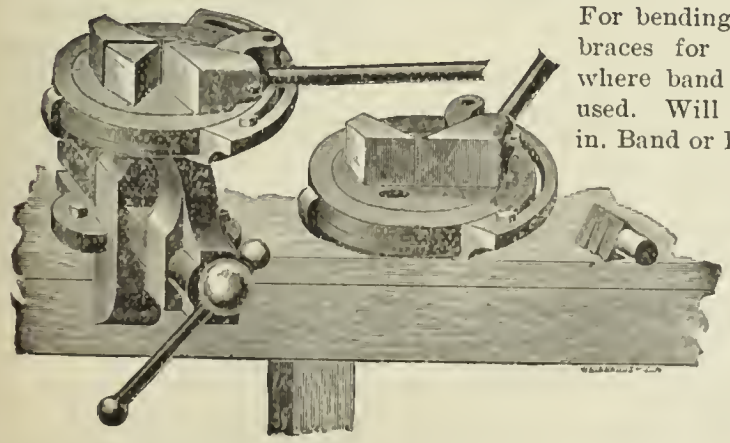
SEND FOR CIRCULAR.

Manufactured by TUERK WATER METER CO., Fulton, N. Y.

ALPHABETICAL LIST OF ADVERTISERS.

Acme Roofing Co..... 86
Ætna Standard Iron & Steel Co..... 81
Allen's Corrugating Wks... 85
American Radiator Co..... 1
American Roofing Co..... 86
American Sheet Iron Co..... 79
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 75
Auld & Conger..... 73
Aurora Vapor Stove Co..... 13
Bailey-Farrell Mfg. Co..... 74
Bangor Excelsior Slate Co.. 88
Barstow Stove Co..... 96
Bascom, H. Clay 69
Belden, F. E. Mica Mining Co..... 28
Belding Mfg. Co .....24&25
Bellaire Stamping Co..... 65
Berger Bros..... 77
Berger, L. D..... 89
Bibb, B C. Stove Co . 18
Black Diamond Tin Plate Works..... 79
Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 28
Bowen Mfg. Co..... 28
Bowers, Galpin & Co..... 78
Brauer, A. G..... 69
Brombacher's Sons, Jacob.. 95
Bronson Supply Co..... 67
Bruce & Cook.....83&96
Buffalo Register Works..... 62
Bnrgess Soldering Furnace Co..... 73
Burtis, A. L..... 88
Burton, W. J. & Co..... 84
Calely, Ed. L..... 69
Calvert, P. B. & Co 81
Cambridge Iron & Steel Co.. 80
Canfield, H. O..... 76
Canton Steel Roofing Co..... 87
Carton Furnace Co..... 3
Central Oilgas Stove Co..... 27
Central Pattern Works..... 69
Central Stamping Co 66
Chamberlain, J. W. Co..... 77
Cheney, S. & Son 70
Chicago & Erie Stove Co..15&22
Cincinnati Corrugating Co.. 85
Cincinnati Stamping Co..... 86
Clad, V. & Sons..... 17
Clark, G. M. & Co..... 12
Clark Novelty Co..... 74
Clark, Quien & Morse ... 78
Clayton & Lambert Mfg. Co. 72
Clough, R. M 91
Columbia Roofing Co..... 87
Colwell Lead Co..... 78
Cooney, Selner & Co..... 74
Cope, Geo. W..... 69
Corning Mfg. Co. 18
Correspondence School of Mechanics 61
Cortright Metal Roofing Co. 87
Covert Mfg. Co..... 77
Craig-Reynolds Fdy. Co..... 22
Crosby, G. A. & Co..... 90
Curtis & Curtis..... 74
Dalton-Ingersoll Co..... 71
Day Mfg. Co..... 75
Daytou Mfg. Co..... 11
De Haven & Co..... 14
Deming Co..... 74
Dixon, Jos., Crucible Co..... 88
Dixon-Woods Co..... 11
Douglas, W. & R..... 74
Dover Machine Works..... 91
Dunlap, John Co..... 81
Eckstein, Chas. G. & Co..... 95
Eddy Electric Mfg. Co..... 70
Electric Boiler Co..... 18
Eller, J. H. & Co..... 85
Emack, John D..... 88
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co 88
Ferracute Machine Co..... 89
Ferrosteel Co..... 16
Fostoria Steel Roofing Co... 87
Frink, I. P.. 96
Friedenwald Bros..... 71
Friedley & Voshardt..... 86
Froelich, A., Estate of..... 68
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 88
Garry Iron & Steel Roofing Co 87
Geuder & Paeschke Mfg. Co. 64
Giblin & Co..... 19
Globe Iron Roofing & Corrugating Co..... 87
Globe Ventilator Co..... 69
Gobeille Pattern Co..... 69
Gordon, W. J..... 88
Gorton & Lidgerwood Co..... 1
Graff & Co..... 22
Greene, W. F 63
Griswold Mfg. Co..... 63
Gummey, Spering & Co..... 79
Gurney Heater Mfg. Co..... 19
Gurney Refrigerator Co..... 28
Halliday, M..... 87
Hanson & Van Winkle Co... 70
Harrington & King Perf. Co. 29
Hart & Crouse..... 17
Hartford Hollow Ware Co.. 65
Hartman, E. C..... 69
Henrie Mfg. Co..... 73
Hess, Snyder & Co 17
Highland Foundry Co..... 1
Highton, Wm. & Sons..... 62
Holton Iron Roofing Co..... 87
Howard Furnace Co..... 30
Howard Thermostat Co..... 29
Howson & Howson..... 61
Hull, M. L..... 72
Illinois Zinc Co..... 83
Iwan Bros..... 70
Jackson's Sons, W..... 15
Jenkins Bros..... 1
Jersey City Galvanizing Co. 74
Johnson, E. J. & Co 88
Kanneberg Roofing Co..... 76
Kansas City Metal Roofing & Corrugating Co..... 80
Keen & Hagerty..... 66
Keene, Geo. C. & Co 91
Kelly, Thos. & Bro..... 71
Kemp, C M Mfg. Co..... 75
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 61
Kewanee Boiler Co..... 29
Kieckhefer Bros. & Co..... 66
Kieley, T. 1
Kilbourne & Jacobs Mfg. Co. 72
Lawrence-Letts Elbow Co... 78
Lightning Dasher Egg Beater Co..... 63
Lindemann, A. J. & Hoversou Co..... 10
Littleford Bros..... 82
Lyon, Conklin & Co.... 90
McDaniel & Harvey Co..... 83
McLain, J. H. Co..... 16
McLaughlin, J. K..... 69
Mahony, M..... 23
Marcy Stove Repair Co..... 68
Marlin & Co..... 78
Marston, I. G. & Co..... 78
Mason Regulator Co..... 1
Merchant & Co., Inc..... 84
Merry, Geo. E..... 79
Meurer Bros. Co. 82
Meyers, Fred. J. Mfg. Co.... 67
Mica Mfg. Co..... 29
Michigan Stove Co.....20&21
Michigan Vapor Stove Co... 11
Millar, Chas. & Son..... 96
Miller, Jas. A. & Bro.....76,86&87
Miner & Peck Mfg. Co..... 95
Monarch Stove Co..... 8
Montross Metal Shingle Co.. 84
Mt. Penn Stove Works..... 14
Mowry, W. C..... 18
Mullins, W. H..... 85
Mnnsell, E. & Co... ..... 29&61
Myers, F. E. & Bro..... 74
National Wringer Co..... 64
Newark Regulator Co..... 73
New Castle Steel & Tin Plate Co..... 79
New Haven Heating & Plumbing Co..... 19
New York Central Iron Wks. 26
New York Elbow Co..... 65
New York Iron Roofing & Corrugating Co..... 86
New York Nickel Plating & Mfg. Co..... 68
Niles Mfg. Co..... 77
Obdyke, W. A. & Co..... 76
Obermayer, S. Co..... 68
Ohl, Geo. A. & Co 94
Osborn, J. M. & L. A..... 79
Ostrander, W. R. & Co..... 68
Packard Enameling Co..... 63
Page Boiler Co., Wm. H..... 23
Palermo Mica Co .. 28
Pancoast, Henry B. & Co.... 75
Paxson, J. W. & Co 68
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co . 75
Peck-Williamson Heating & Ventilating Co..... 4
Penn Iron Roofing & Corrugating Co. 84
Phelps, Dodge & Co 80
Phillips Tin Plate Co..... 82
Pontyminster Old Style Ternes..... 80
Poorman Mfg. Co..... 95
Portsmouth Stove & Range Co..... 26
Presbrey Stove Lining Co... 69
Proudman Bros..... 76
Puffer, W. E..... 63
Putnam Foundry & Machine Co 23
Rathbone, Sard & Co..... 9
Republic Iron Works..... 82
Rlugen Stove Co..... 2
Robinson, J. M. & Co 95
Rochester Stamping Wks.... 65
Rome Mfg. Co..... 67
Root, A. L..... 88
Rutland Fire Clay Co..... 69
St. Louis Corrugating Co.... 82
St. Lonis Stamping Co..... 67
S S. S. Conductor Co..... 78
Salem Nail Co..... 88
Sanborn, John..... 87
Sandwich Novelty Co..... 70
Saunders' D. Sons..... 73
Savill, Walls & Co..... 75
Sayre Stamping Co..... 63
Schaffer, J. P..... 29
Schneider & Trenkamp Co.. 7
Sheppard, Isaac A. & Co..... 1
Sims Mfg. Co. 77
Smith & Winchester Co..... 23
Smith Co., H. B 26
Smith, J. D. Foundry Supply Co 69
Souther, E. E. Iron Co..... 80
Special Notices..... 61
Sperry, D. R. & Co..... 65
Stamford Foundry Co..... 15
Standard Lighting Co..... 6
Star Coupler Co 17
Star Mfg. Co..... 65
Stebbins, E. Mfg. Co..... 76
Steel Clad Bath Co.. 71
Stellwagen & Kynoch..... 62
Stiles & Parker Press Co 94
Stocking, E. B 61
Stuart & Peterson Co..... 65
Sykes Iron & Steel Roofing Co 87
Taplin, Rice & Co..... 15
Tarbox Mfg. Co..... 68
Taylor Co., N. & G..... 96
Tinners' Machinery & Supply Co. 88
Tinplate Decorating Co..... 80
Toledo Machine & Tool Co.. 89
Trimont Mfg. Co 75
Troy Nickel Works..... 29
Tuerk Water Meter Co..... 90
Tuttle & Bailey Mfg. Co..... 62
United States Heater Co.... 26
Valentine, M. D. & Bro. Co... 69
Van Noorden, E. & Co.. 84
Vedder Pattern Works... 69
Vogel William & Bros..... 64
Walther & Christman..... 78
Washburne, E. G. & Co..... 69
Weathered's, Thos. W. Sons 16
Western Stove & Mfg. Co.. 10
Wheeling Corrugating Co... 85
Wisconsin Refrigerator Co.. 28
Wister, L. & R & Co..... 86
Wolff, L. Mfg. Co. 72
Wood, Alan Co. .. 80
Wood Co., W. Dewees. ... 96
Yates & Co 61
Zero Valve Co..... 74
Zucker, Levett & Loeb Co... 70

A New Bending and Forming Tool



For bending and forming stays and braces for cornice or other work where band iron or steel are to be used. Will bend any shape ¼ x 2 in. Band or Bar.

THE KEENE BRAKE,

AND SHEET METAL WORKING MACHINERY A SPECIALTY.

GEORGE C. KEENE & CO., - Cincinnati, O.

PRESSES, DIES AND TOOLS

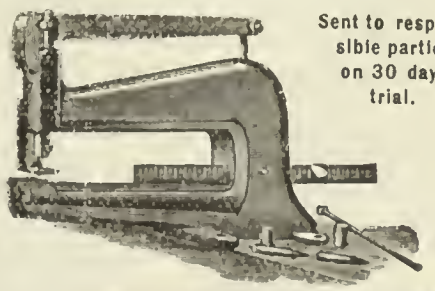
For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS, Dover, Del.



Sent to responsible parties on 30 days' trial.

CLOUGH'S IMPROVED FOOT PRESS,

For Sheet Metal Work. Punches to center of 36 in. sheet or 5 in. pipe 30 in. long. Handiest Press made. Dies and Punches furnished with every Press. Weight about 175 lbs. For Descriptive Circular and Price, address

R. M. CLOUGH, Tolland, Conn.

CLASSIFIED LIST OF ADVERTISERS.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield H. O., Bridgeport, Conn,

Bathtubs.
Day Mfg. Co., Detroit, Mich.
Peck Bros., & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers Tools and Machines.
Bliss E. W. Co., Brooklyn, N. Y.
Crosby G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N.J
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y

Castings.
Cheney, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Friedenwald Bros., Baltimore, Md.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Conductor Pipe and Elbows.
Acme Roofing Co., Canton, O.
Allen's Corrugating Works Chicago, Ill.
Berger Bros., Philadelphia, Pa.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A., & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Ferracute Machine Co., Bridgeton, N.J
Keene, Geo. O. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Corrugating Works, Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro. Chicago, Ill.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cuspidores.
Rochester Stamping Works, Rochester, N. Y.

Cut-Offs, Rain-Water.
Cooney, Selner & Co. Indianapolis,
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
E. W. Bliss Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct

Eave Troughs.
Berger. L. D., Philadelphia, Pa.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Mfg. Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Clark, Quien & Morse, Peoria, Ill
Prondman Bros., Meriden, Conn.
Walther & Christman, Cleveland, O.

Egg Beaters.
Lightning Dasher Egg Beater Co., Toledo, Ohio.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand St., New York.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets:
Troy Nickel Works, Troy, N. Y.

Flour Bins and Sifters.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Flour Sifters.
Meyers, Fred J. Mfg. Co., Covington Ky.

Foundry Facings, Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, E. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Craig-Reynold Foundry Co., Dayton Ohio.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Conn

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Henrie Mfg. Co., Xenia, O.
Hull, M. L., Cleveland, O.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Groovers.
Tuerk Water Meter Co., Fulton, N. Y.

Handles and Knobs.
Packard Enameling Co., Warren, O.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y
Poorman Mfg. Co., Canton, Ohio.

Heater Regulators.
Buffer. W. E., 8 Peck Slip, N. Y.

Heaters, Steam and Hot-Water.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
McLain, J. H. Co., Canton, Ohio.
Mabony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New Haven Heating & Plumbing Co., New Haven, Conn,
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Putnam Foundry & Machine Co., Putnam Conn.
Smith Co., H. B. 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass
United States Heater Co., Detroit, Mich
Weathered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Stuart & Peterson Co., Philadelphia, Pa.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co. Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Lacquers and Japans
Hanson & Van Winkle Co., Newark, N. J.

Lamp Stoves and Heaters.
Central Oilgas Stove Co., Boston, Mass

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 89 Fulton St., N. Y.

Molding Sand.
Obermayer, S. Co., Cincinnati, Ohio.
Smith, J. D., Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating and Mfg. Co., 227 and 229 West 29th St., N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand Street, New York.

Oil Cans.
Central Oilgas Stove Co., Boston, Mass
Star Mfg. Co., Cantou, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Pattern Charts,
Burtis, A. L., Lockport, N. Y.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, Jno. K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Perforated Sheet Metal.
Harrington & King Perforating Co., Chicago, Ill.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Henrie Mfg. Co., Xenia, O.
Hull, M. L., Cleveland, O.
Kelly, Thos. & Bros., Chicago Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
Star Coupler Co., St. Louis, Mo.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Wolff. L. Mfg. Co., Chicago, Ill.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher
Vogel, Wm. & Bros., 37 to 47 S. Brooklyn.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover. Del.
Ferracute Machine Co., Bridgeton, N. J.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Peck, Stow & Wilcox Co., 27 Chambers St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 45 Vesey St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water
American Radiator Co., Chicago, Ill.
Exeter Mch. Works, Boston, Mass.
Gurney Heater Mfg. Co. Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl Street, N. Y.

Refrigerators.
Belding Mfg. Co., Belding, Mich.
Bower Mfg. Co., Fond du Lac, Wis.
Gurney Refrigerator Co., Foud du Lac, Wis.
Wisconsin Refrigerator Co., Eau Claire Wis.

Registers.
Buffalo Register Works Buffalo, N. Y.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St. N. Y

Rool Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel Corrugated and Plain.
Acme Roofing Co., Canton, O.
American Roofing Co., Cincinnati, O.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinna l Corrugating Co., Piqua, O.
Columbia Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, Ohio.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing and Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
Souther, E. E. Iron Co., St, Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Lyon, Conklin & Co., Baltimore, Md.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Emack, J. D., Philadelphia, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

SEE ALPHABETICAL INDEX, PAGE 91.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics' Scranton, Pa.

Sheet Metal Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover, Del.
Ferracute Machine Co. Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co. Toledo, O.
Tuerk Water Meter Co., Fulton, N. Y.

Shingles and Tiles, Metallic.
Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co. Cincinnati, O
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Wolff, L. Mfg. Co., Chicago, Ill.

Skate Sharpeners.
Sandwich Novelty Co., Sandwich, Ill.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.

Slater's Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presby Stove Lining Co., Tannton, Mass.
Rutland Fire Clay Co., Rutland, Vt
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Patterns.
Bascom, H. Clay, Troy, N. Y.
Caiely, Edw. L., Philadelphia, Pa
Central Pattern Works, Dayton, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son., Manlius, N. Y.

Stove Repairs.
Braner, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., City.
Troy Nickel Works Troy, N. Y.

Stove Trucks.
Stellwagen & Kynoch, St. Ignace, Mich.

Stoves and Ranges.
Bibb, B. C., Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
Clad, V. & Sons, Philadelphia, Pa.
DeHaven & Co., Pittsburgh, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co, Boston, Mass
Michigan Stove Co., Chicago Ill.
Mt. Penn Stove Works, Reading, Pa.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Stamford Foundry Co., Stamford, Conn.
Taplin, Rice & Co., Akron, O.

Stoves and Ranges, Gas.
Central Oligas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Dixon-Woods Co., Pittsburgh, Pa.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.
Aurora Vapor Stove Co., Cleveland, O.
Barstow Stove Co., Providence, R. I.
Central Oligas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill.
Dayton Mfg. Co., Dayton, Ohio.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Mich. Vapor Stove Co., Grand Rapids, Mich.
Monarch Stove Co., Mansfield, Ohio.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Western Stove and Mfg. Co., Milwaukee, Wis.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Black Diamond Tin Plate Wks., Phila. Pa.
Bruce & Cook, 186 to 190 Water St. N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Dunlap, John Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps Dodge & Co, 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila., Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., N. Y.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Keen & Hagerty, Baltimore, Md.
Kleckheter Bros. & Co., Milwaukee Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders, D. Sons, Yonkers, N. Y.
Trimont Mfg. Co., Roxbury, Mass.

Tools, Machines and Supplies Tinners'.
Berger, L. D., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N. Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, Ohl, George A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., Cliff St., N. Y.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Calvert, P. B. & Co., Philadelphia.
Globe Ventilator Co., Troy.
Iwan Bros., Streator, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wire Goods.
Meyers, F. J. Mfg. Co., Covington, Ky.

Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - -	$1.00	SIX MONTHS, - - - - - -	$22.10
ONE MONTH, (5 Times.) - - - -	5.00	ONE YEAR, - - - - - -	40.80
THREE MONTHS, - - - - -	12.35		

RATES FOR LARGER SPACES QUOTED ON APPLICATION.

DAVID WILLIAMS, Publisher,

96, 98, 100 and 102 Reade Street, NEW YORK. **59 Dearborn Street, CHICAGO.**

New York (Main Office), - - -	96-102 Reade Street. - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509, Hamilton Building, - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - -	HENRY SMITH, Manager.
St. Louis, - - - - - - -	Bank of Commerce Building, - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon St., London,

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe; or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A., The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

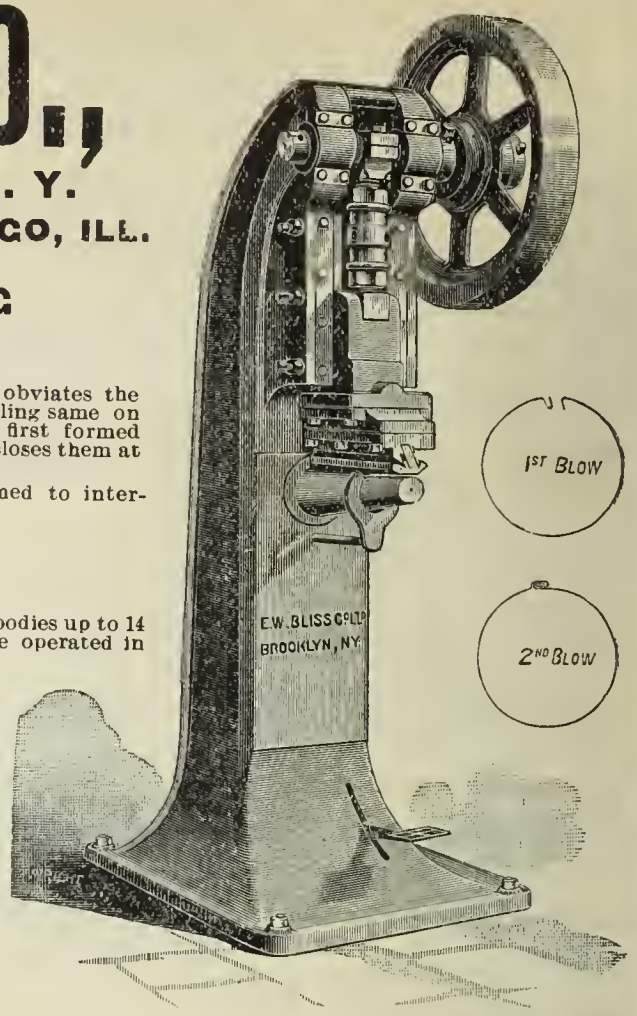
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.



PRESSES, PUNCHES, SHEARS,

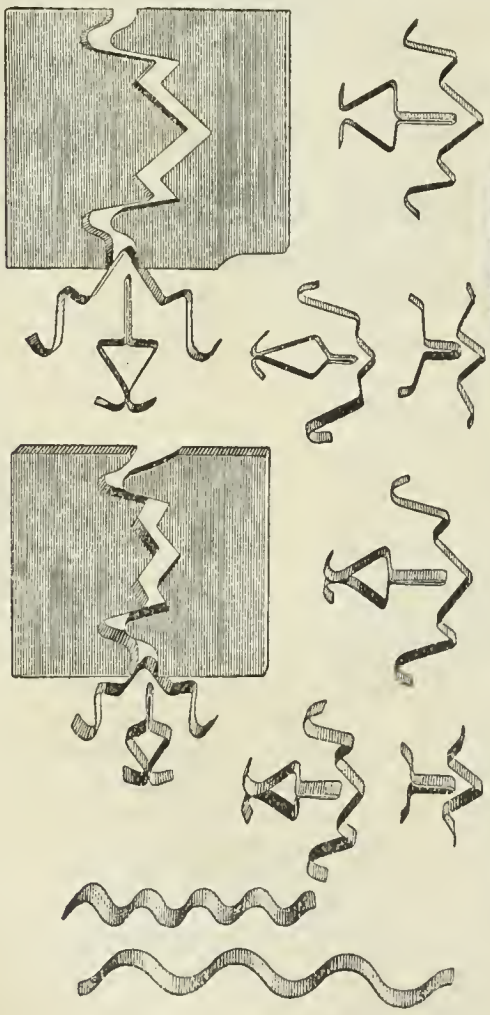
DROP HAMMERS,

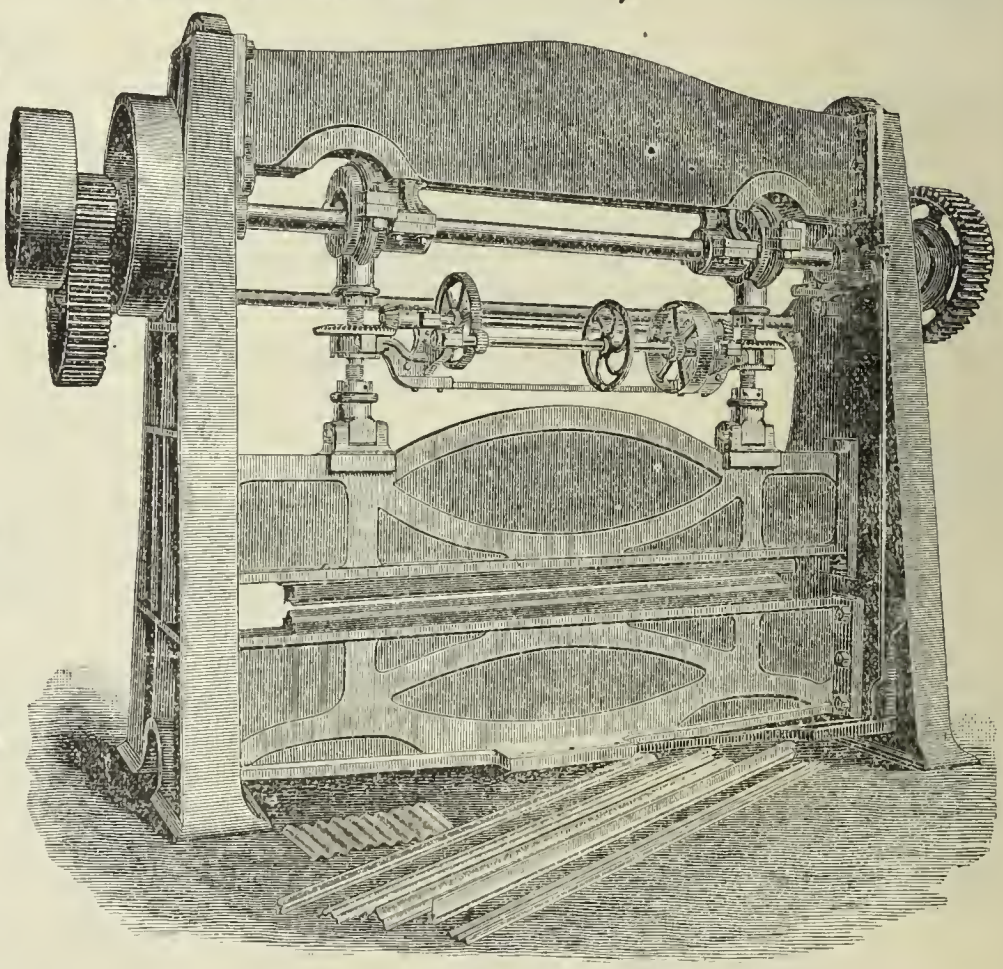
DIES, SPECIAL MACHINERY, &c.

THE STILES & PARKER PRESS CO.

GEO. A. OHL & CO., 157, 159, 161 Oraton Street, NEWARK, N. J.

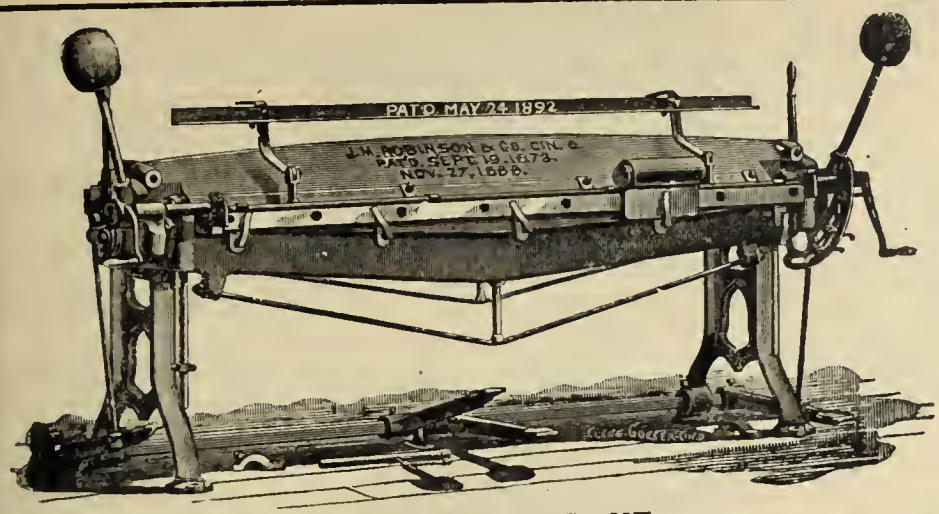
SOME SAMPLES OF WORK PRODUCED ON THESE MACHINES.





Improved Sheet Metal Power Press.

The above cut represents a ten foot power press weighing 20,000 pounds. This machine will make a skylight bar seven (7) bends at once of No. 24 iron, corrugate as heavy as No. 14 iron, also will press out mouldings of any shape that can be pressed between two dies. It is provided with a special mechanism for raising and lowering the hammer, with the die holder and die, to suit the different heights of the latter.

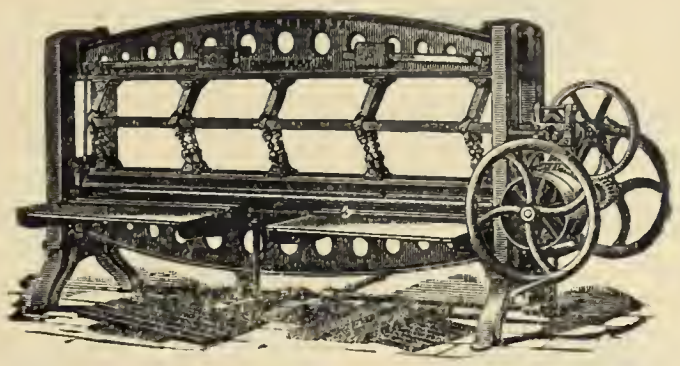


THE "GLOBE" CORNICE BRAKE.

With which to form Sheet Metal into Cornice Mouldings, Ridge Caps, Skylight Bars; and with Beader and Gutter Former attached to Brake (price of which is extra), Bead and Form Gutters. Cornice manufacturers' Steel Straight Edges, 30 inch to 10 foot lengths.

ROOFING MACHINE.

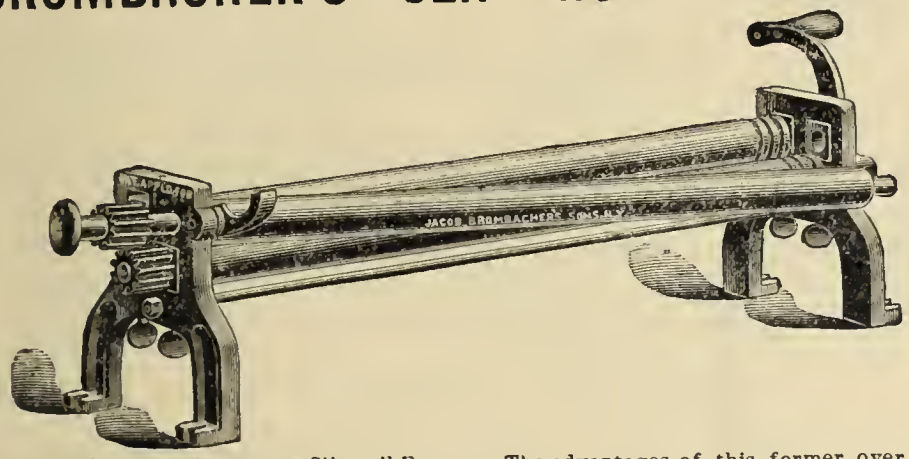
With Dies suitable, will form Sheet Metal Roofing, Siding, Ceiling, Weather-Boarding, Skylight Bars, Metal Lathing, Gutters, Ridge Caps, Escalloped Steel Sheets and Cattle Troughs.



J. M. Robinson & Co., Mfrs.,

225-229 W. Second St., Cincinnati, Ohio, U. S. A.

BROMBACHER'S SLIP ROLL FORMER.



Above cut represents our new Slip-roll Former. The advantages of this former over ordinary formers are

First, that the rollers are made of cold rolled steel rolls.

Second, it has cut gears with consequent smoothness of operation.

Third, the thumb screws are inserted from underneath, consequently the box carrying the rollers rests on the screws instead of the screws carrying the boxes and rollers; this obviates the possibility of breaking thumb screws.

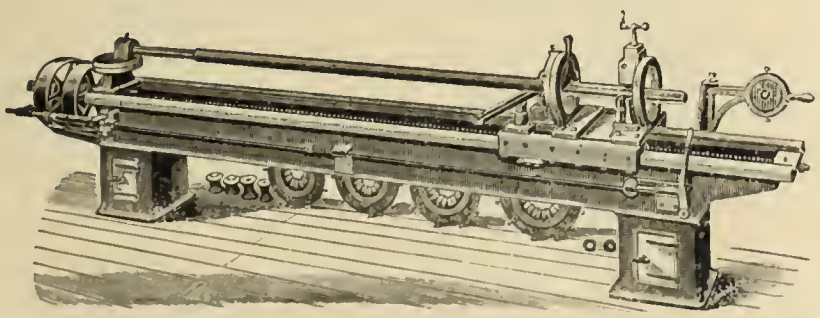
Fourth, we do not have to split one frame in order to obtain the slip-roll mechanism, and we therefore have all the rigidity of ordinary formers with all the convenience of slip-roll formers.

Above design makes the smoothest and quickest operating and stiffest Former on the market and they are sold at the price of ordinary Stove Pipe Formers.

JACOB BROMBACHER'S SONS - - No. 30 Cliff St., N. Y. City.

Established 1833 Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

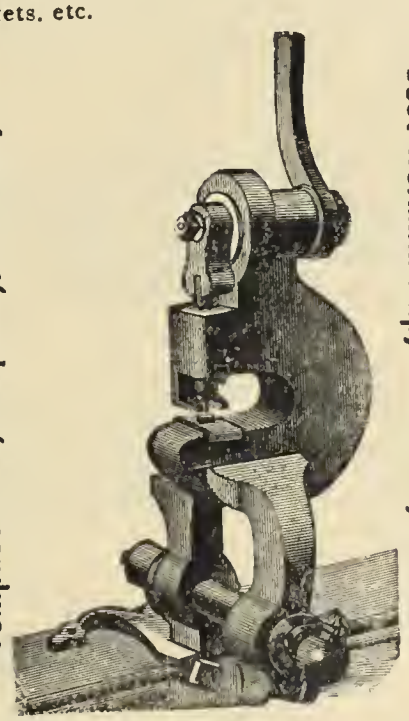
WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

CHAS. G. ECKSTEIN & CO.,

45 Vesey St., New York.

Punches and Shears, Wrought Iron Ornaments, Mouldings, Rosettes, Fence Pickets, etc.



Compact Form, Simplicity, Durability. Best Workmanship, Few Parts, Low Price.

SEND FOR CIRCULAR.



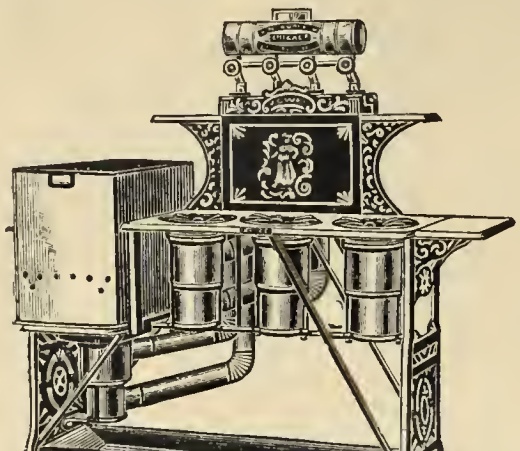
— She: "These horrid photographs don't do me justice at all."

He: "My love, it's not justice you stand in need of—it's mercy."—*New York Ledger.*

— "Well, your are the first man I ever heard accuse Timmins of being full of energy."

"But he must be. He has been storing it up for years"—*Indianapolis Journal.*

Gasoline Stoves! Gasoline Stoves!



Do you want the "Dangler" Vapor Stove?
" " "Jewel" "
" " "Bay State" "

Would you like to know about Gasoline Stoves?

Then write us, for

WE ARE THE PEOPLE

that would like to sell you

But! *Now is the time to secure the Agency,* SO

Do Not Delay.

BARSTOW STOVE COMPANY,

Manufacturers of

"Bay State" Furnaces. Ranges. **"Bay State"** Stoves. Gas Ranges.

BOSTON. PROVIDENCE, R. I. NEW YORK.

Why not keep before you special circulars and prices of our goods?

Tinplate

—FOR—

Sugar Buckets and Kindred Uses.

12 X 12	28 X 20
12 X 24	14 X 21
10 X 20	14 X 22
14 X 20	15 X 21
16 X 20	16 X 22
11 X 22	20 X 20

IC and IX, PRIMES and WASTERS.

N. & G. TAYLOR CO.,

Manufacturers,

PHILADELPHIA.

THE GREAT CHURCH LIGHT REFLECTORS FOR OIL, GAS OR ELECTRIC LIGHT
I. P. FRINK. 551 PEARL. ST. N.Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

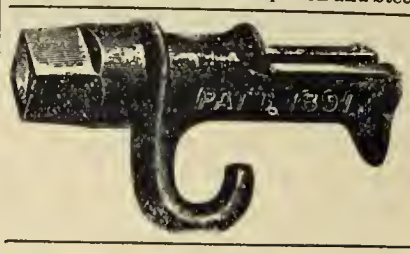
Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COO

TINNERS' TOOLS and MACHINE

TINNERS' SUPPLIE

186, 188 & 190 Water Street,
248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT

MADE IN ONE PIECE WITH HO

By far the best Spout made. Greatly proved this season. More used every year all others combined. Sold by leading job everywhere, and to them by

CHARLES MILLAR & SON, Utica,

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPAN

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRO

PATENTED:

Decemher 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. A WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh Pa.

The Metal Worker Essays on House Heatir by Steam, Hot Water and Hot Air.

WITH INTRODUCTION AND TABULAR COMPARISONS.

Second edition, revised. To which has been added a selection fr the Letters of Criticism on the Essays as originally published in T METAL WORKER and a chapter on Proportioning Radiating Surfaces.

How to Effectively and Economically Heat a Given Building

is a problem of the highest importance to the Architect, Builder and Owner. Shall stea water or air be employed as a medium? What are the relative merits of the differ systems? By what means can a comparison be instituted that will show their respect advantages?

The essays comprised in this volume are some of the results of a prize contest conduc by *The Metal Worker* some time since. They include the prize essays and selections fr the best of the others. The foundation of all the essays is a house, the floor plans a elevations of which were the result of previous competitions conducted by *Carpentry a Building*. The elevations and the plans of this house were carefully printed on separ sheets adapted to receive at the contestants' hands lines indicating the position of heat runs of pipes, location of radiators, etc., thus insuring a uniformity in presentation, a also holding the competitors to exactly the same conditions. The result, therefore, t hook in which are shown: First, different means of heating the same house, among wh may be instituted various comparisons, and, second, several different interpretations each of the several methods, among which also instructive comparisons may be institute

The work is not a mere theoretical consideration of principles and a statement of fa gained by inquiry in the trade; but, instead, a collection of essays by practical men, ea showing how one man would go about heating the building in question, using the mea with which he is best acquainted in practice. Features of the book which are not the le important among its numerous merits are the *lists of items and statement of cost* companying the different essays. Never before in the history of the heating trades has th been offered such a collection of information directly from the practice of those who a actively engaged in the heating business as is contained in this volume.

"The whole forms a valuable and instructive exposition of current practice house heating."—*American Machinist.*

"Covers the ground very completely."—*Scientific American.*

"It will be found as complete a compendium as possible of existing informati on this subject, amply illustrated by drawings."—*The Sanitary Era.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we only had the information contain in this volume in earlier life, we could now have dollars where we only ha buttons."

407 pages, 7 x 9½ inches. Handsomely bound in clot One volume. Price, $3.00.

SENT, POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS, Publisher, 96-102 Reade St., New Yo

Index to Reading Matter, Page 67.

Index to Advertisements, Pages 91 · 93.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. XLIII. NUMBER 3.

NEW YORK AND CHICAGO, JANUARY 19, 1895.

ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



NATIONAL.

AMERICAN RADIATORS BEST ON EARTH.

(TRADE-MARK.)

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

111 and 113 Lake Street, CHICAGO, ILL.

New York. 45 Centre St. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F & W Co.

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.

FULLER & WARREN CO. TROY, N.Y.

PARAGON HOT AIR FURNACES

SIX POINTS — 1·FEWEST JOINTS 2·EQUALIZED DRAFT 3·LARGEST RADIATING SURFACE 4·ABSOLUTELY SELF CLEANING 5·BALL BEARING GRATE 6·PERFECT ADAPTABILITY TO ANY KIND OF COAL

ISAAC A. SHEPPARD & CO. MANUFACTURERS

PHILADELPHIA, PA. & BALTIMORE, MD.

Write for our FURNACE BOOK "HINTS ABOUT HEATING"
It will interest you IT MAY HELP YOU
EXCLUSIVE RIGHTS GIVEN TO ENTERPRISING DEALERS

The Apollo

on is flat and soft enough to bear usual bending. lot sometimes; not generally; it is so nearly all ike that we warrant it all alike.

To warrant it so does not make it so. If a sheet uckles or breaks we can take it back and send you nother that don't; or any number of sheets. This is hat we mean by guaranteeing Apollo Galvanized ron.

Apollo Best Bloom is the trade mark.

APOLLO IRON AND STEEL COMPANY

Pittsburgh Pennsylvania

WORKS AT APOLLO

rite for new telegraphic code.

HIGHLAND RANGES, HEATERS and STOVES

HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.

"Kitchen Boiler Connections."

A Selection of Practical Letters and Articles

—RELATING TO—

Water Backs and Range Boilers.

Compiled from *The Metal Worker*.
71 Illustrations.

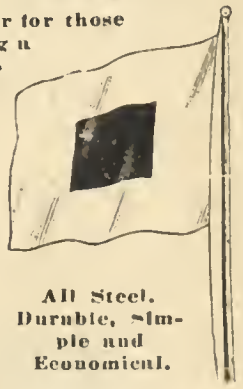
A Practical Helper. Price, $1.00.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG

Has no terror for those using a

FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis Mo.

BOILERS. EXETER RADIATORS.

EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO.,
Boston, Mass.

The Jenkins Automatic Air Valve has proved to be all we claimed for it—i. e., a Positive and Reliable Air Valve. The expansible plug is a special compound, and manufactured expressly for use in the Jenkins Automatic Air Valve. It does not deteriorate or lose its flexibility under the action of heat or steam. With the Jenkins Automatic Air Valve, you should connect with a drip pipe, thus insuring a positive circulation. We guarantee them to be as represented. Our Trade Mark is on every valve.



JENKINS BROS., NEW YORK, BOSTON, CHICAGO, PHILADELPHIA

STEAM SPECIALTIES.

Pump Governors.
Steam Traps.
Steam & Water Reducing Valves.
Noiseless Back Pressure Valves.
Damper Regulators and Oil Separators.
Send for Circulars.



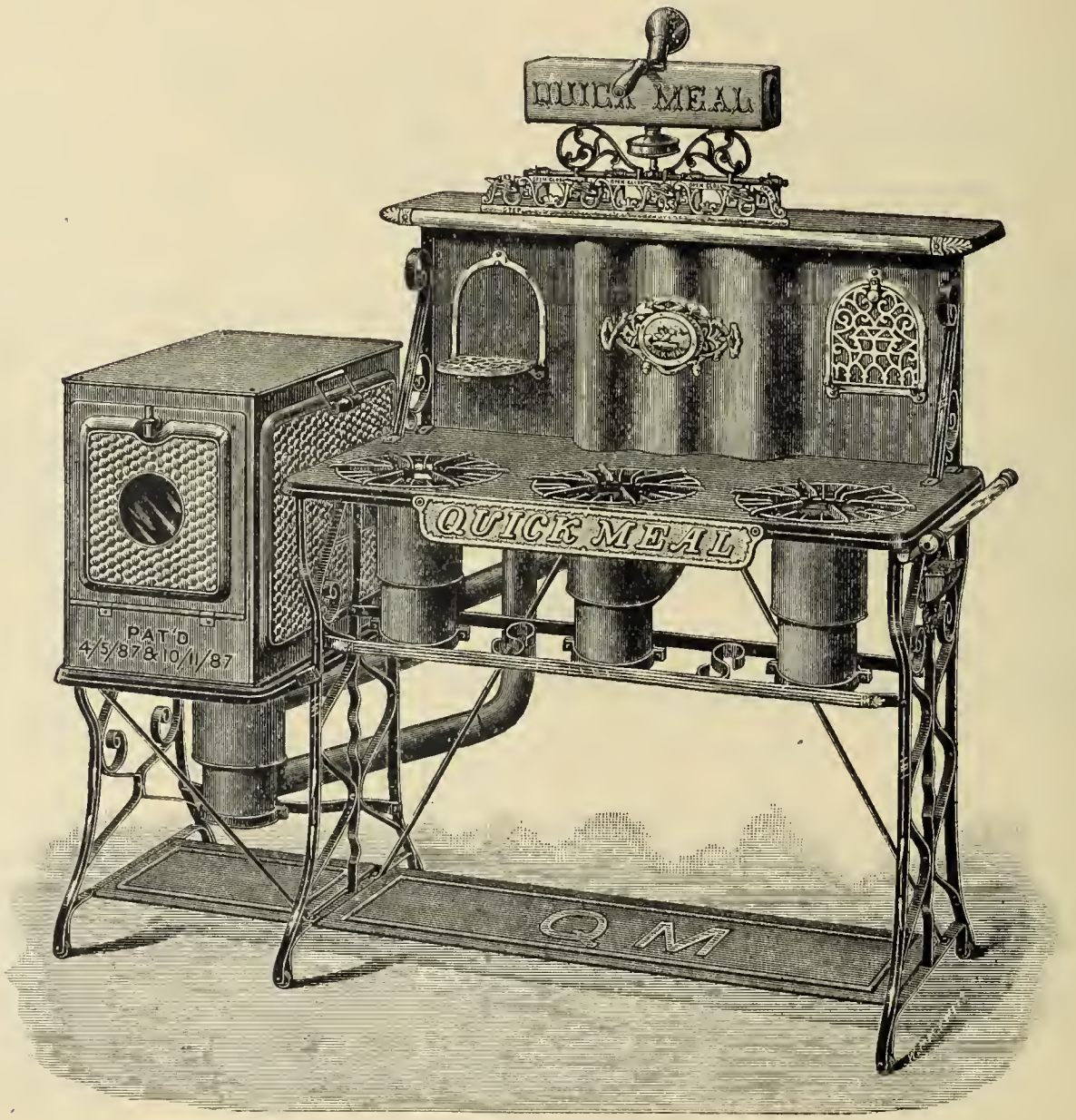
T. KIELEY, 7 to 11 W. 18th St., NEW YORK. Pressure Regulating Valve.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

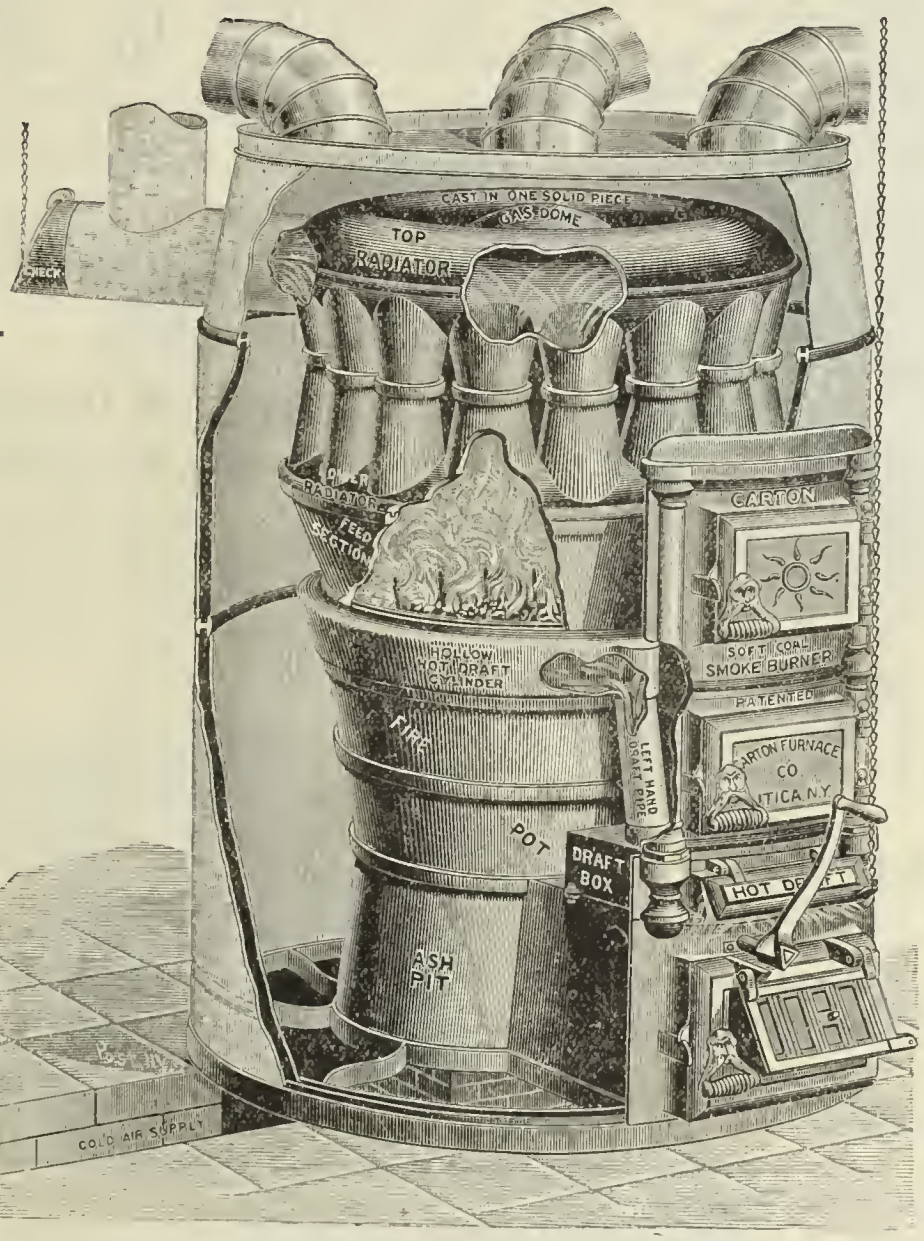
ST. LOUIS.

Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

Hot Water & Steam Boilers & Furnaces.

Our Soft Coal Smoke Consumer.



No Smoke.

No Soot.

Vertical Combustion Flues. Draft EQUALLY divided.
NO CENTRE Draft, but ALL SIDE Draft.
No accumulations in Radiators. No Clean-out Doors.
NO Bolts Used. Most Durable Furnace.

OUR CATALOGUE AND PRICES WILL INTEREST YOU.

MANUFACTURED BY

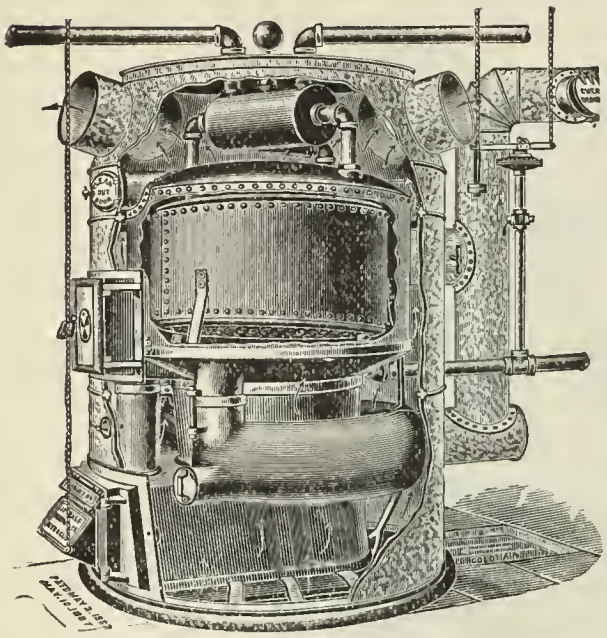
Carton Furnace Co.,

UTICA, N. Y.,

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY
HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

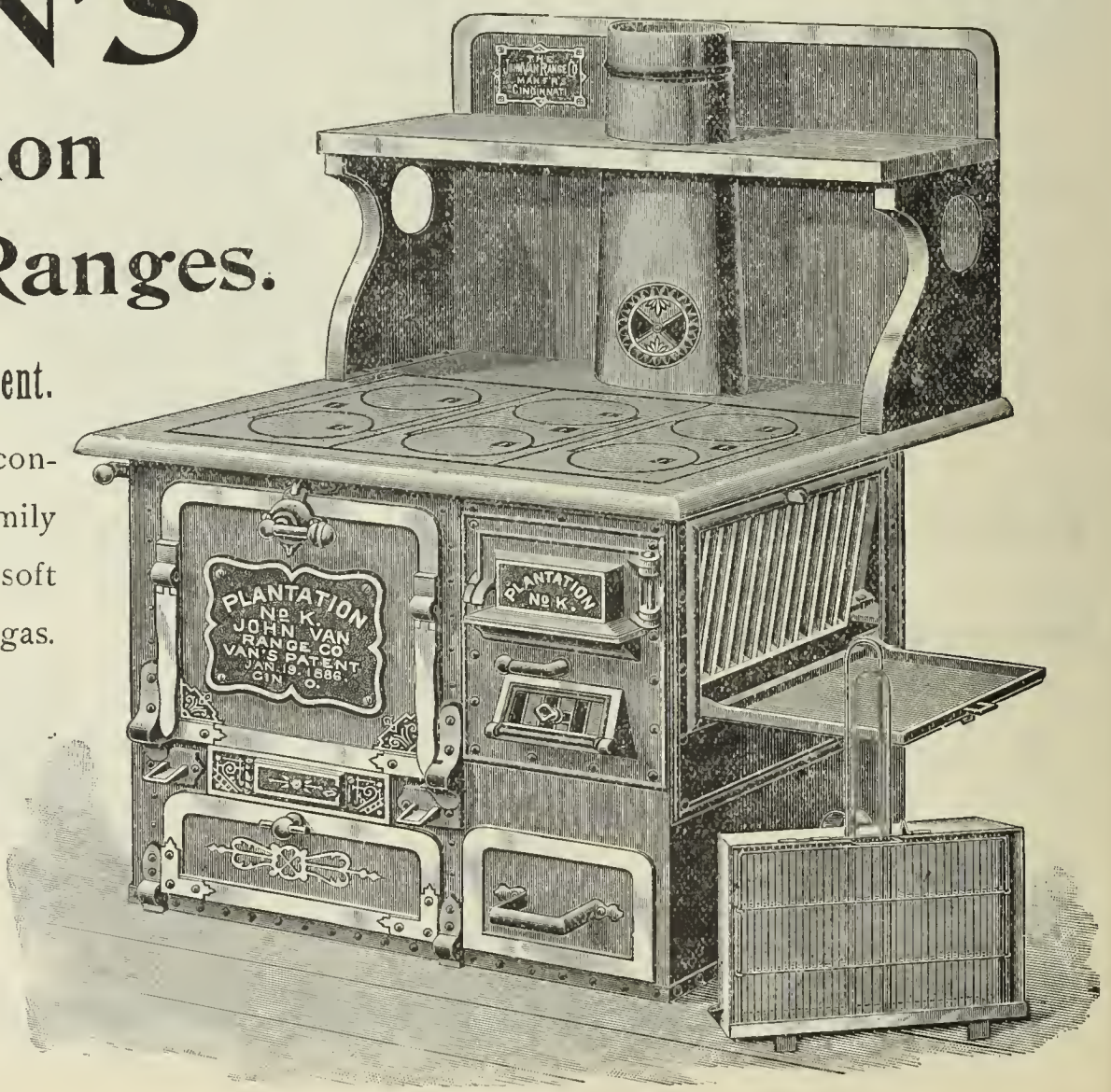
Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

VAN'S
Plantation Ranges.

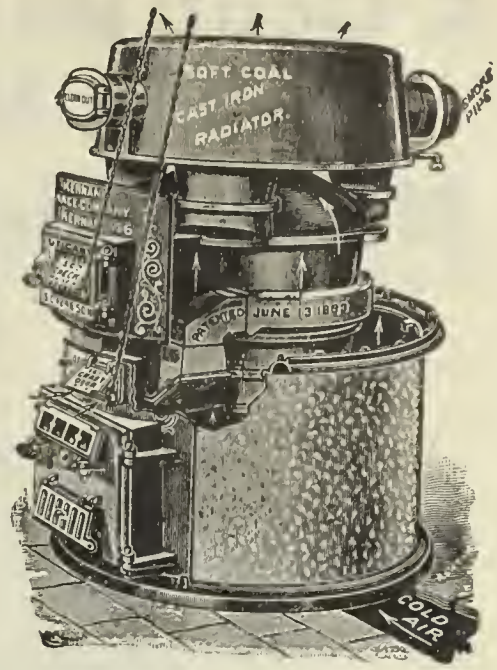
With Broiler Attachment.

The finest, most convenient and best family range ever offered for soft coal, wood or natural gas. Write for our prices before buying elsewhere. It will pay you.

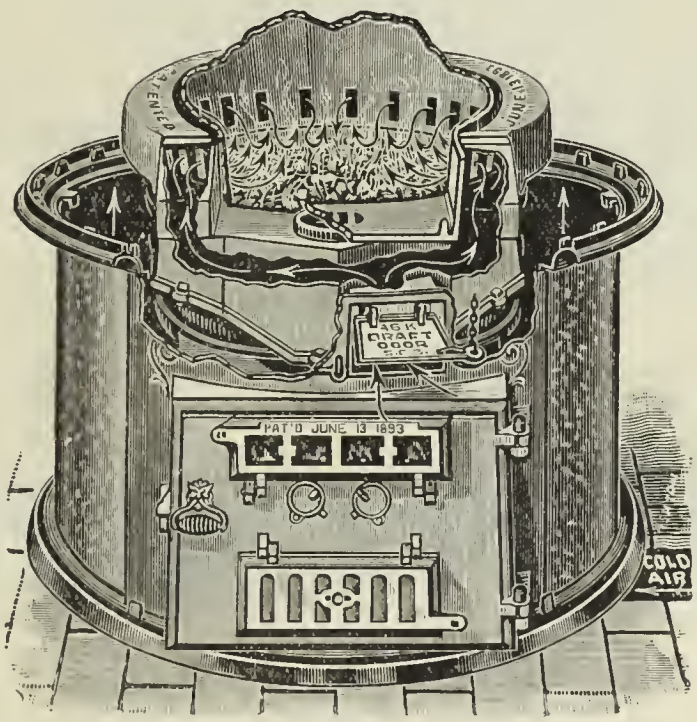


THE
JOHN VAN RANGE CO.,
Mfrs. of Wrought Steel
Ranges, all sizes,
and styles,
Cincinnati, Ohio.

KERNAN Smoke Consumers Lead



In all the sections of the country where soft coal is used.



SECTIONAL VIEW,

showing the principle in the Kernan Smoke Consumer Furnace of a heated current of air entering the fire-pot, igniting with and consuming the smoke from soft coal.

Now is the time to secure the agency and thereby control the furnace trade of your locality. Do not waste time and money experimenting on new and untried constructions. The

Kernan Smoke Consumers

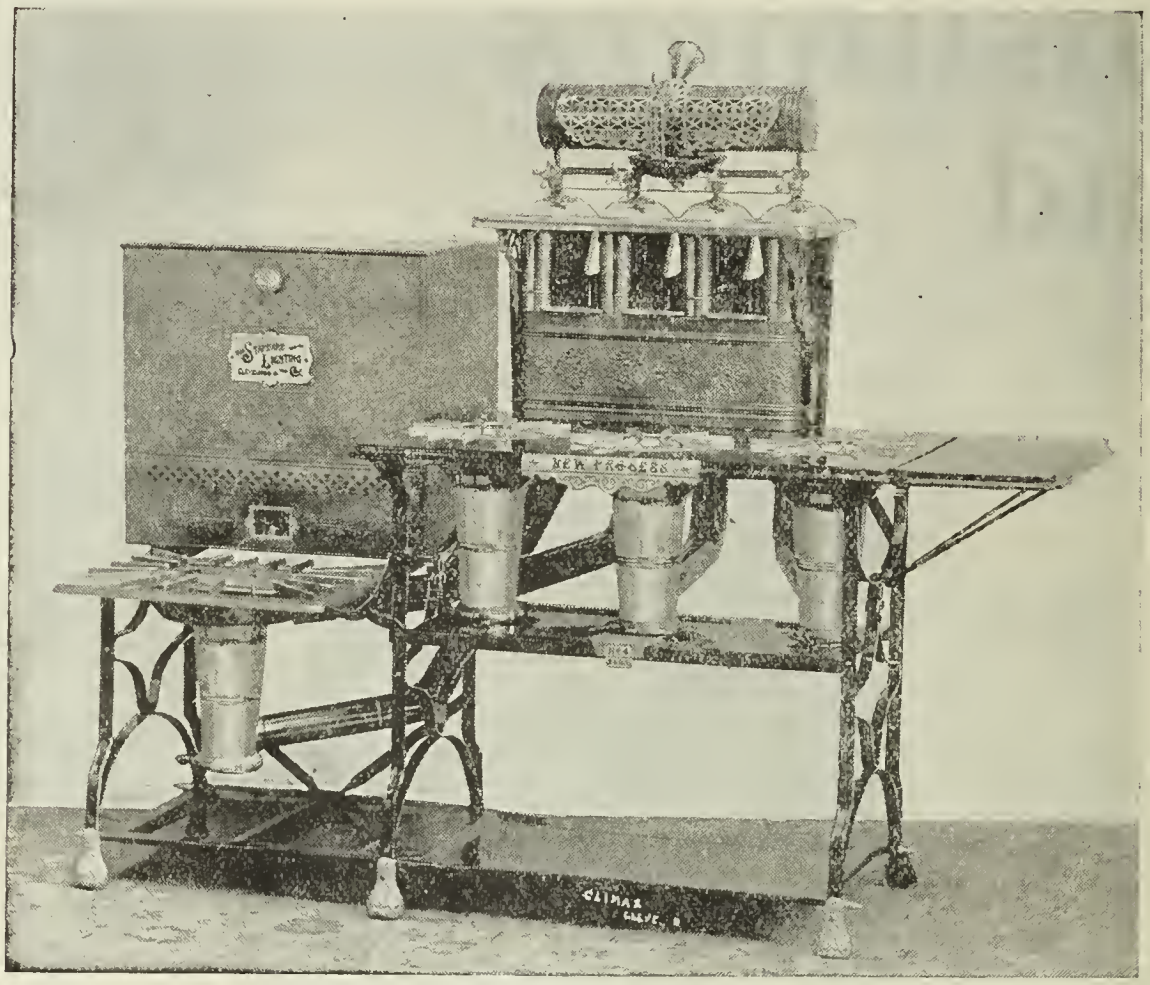
have been used for several years in all parts of the country and with every variety of soft coal and are now conceded by the trade and public to be the only warm air furnace in which soft coal can be cleanly and economically used.

Send for Reference Catalogue of Soft Coal Furnaces.

Kernan Furnace Company,

71 W. Washington St., CHICAGO, ILL. UTICA, N. Y.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

——MADE ONLY BY——

THE STANDARD LIGHTING CO.,
CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La.
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
Milton Rogers & Sons, Omaha, Neb.

DEALERS!

All Weak Points About Vapor Stoves

are not called to your attention by unscrupulous manufacturers or their salesmen. They often palm off imperfect and faulty stoves as perfect, and jolly you into the belief that you have struck a bargain.

But when summer comes and truth comes to light, as it invariably does in the vapor stove business, vexation and disappointment come with it. Vexation, because you have been duped, disappointment, on account of the loss of a season's profit.

Better handle a *good line* at a fair profit than a *poor* line at a *bargain* profit. There is no such thing as a "bargain," especially in the vapor stove business. *Proof*—Review the past???

Better buy from a responsible manufacturer or his legitimate jobber, especially of one whose integrity is unquestioned, and one whose knowledge of the vapor stove business secures you an honest deal and prevents the imposition of fakes or shoddy goods. *There are a few of us left.*

Better buy a good line to be successful. A *bad* stove is a very poor purchase at *any* price.

Better look for Protection.

Protection in order to be of service to you must begin at home. See that this point is not overlooked when casting about for a line for 1895.

Better think this over.

The old adage reads, "Make Haste *Slowly*." This is a weighty proverb. The more so when you consider that the best versed manufacturers in the vapor stove industry are not offering any new inventions or innovations for the coming season.

Yours respectfully,

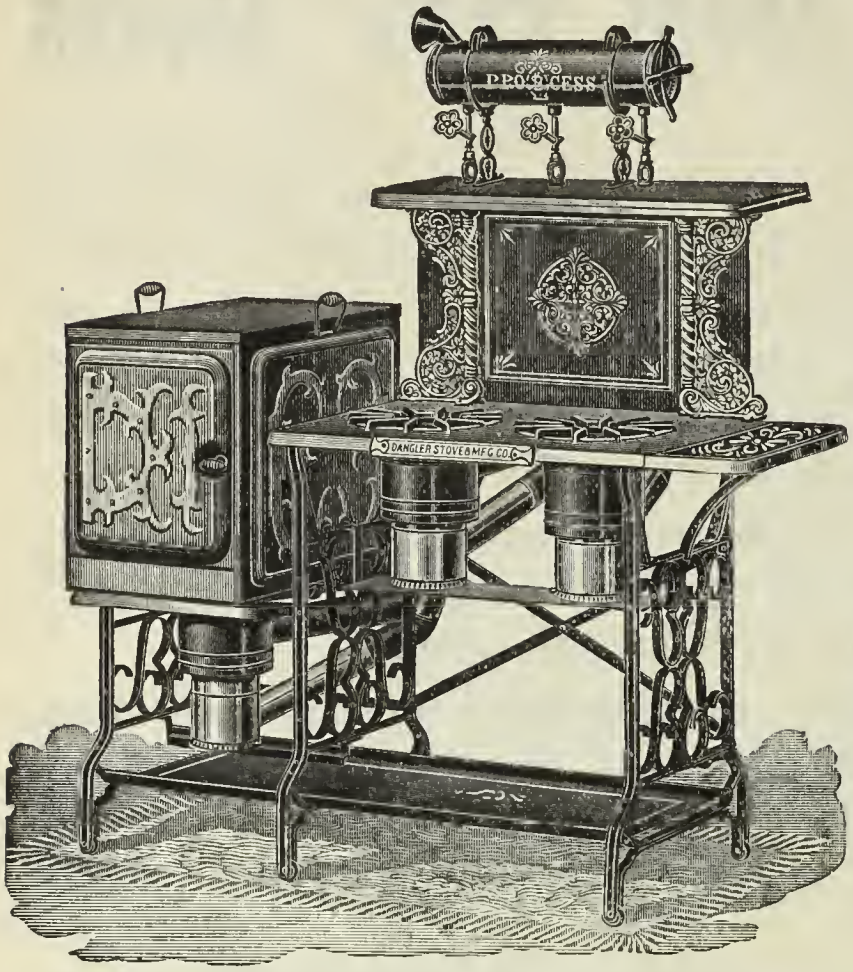
THE SCHNEIDER & TRENKAMP CO.,

479-501 Case Ave., Cleveland, O. 67-69 Lake St., Chicago, Ill.

Jobbers Who Will Handle the Reliable for 1895.

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas and Oklahoma Territory.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERROTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F. FOX, Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N. CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.

Facts of Interest to the Public.



Our "PROCESS" for 1895, we can say unqualifiedly, is the

MOST PERFECT WORKING

PROCESS STOVE EVER PLACED ON THE MARKET, and HAS NO EQUAL.

In calling attention to our

NEW GEM STOVE,

We offer the trade a STOVE FOR THE PEOPLE and FOR THE TIMES.

THE GEM STOVE is CONVENIENT

in SIZE, with the same sized flame as the PROCESS doing the same amount of work with **less fuel,** and at an original cost of only about ONE-HALF that of the regular high Stoves. This Stove is ABSOLUTELY our own, and CAN BE MADE ONLY BY US, and as pioneers in this business, the public naturally look to us for progress, while some of our competitors, who can only make the old line, call such improvements, "an innovation." Our GEM and PROCESS, together with our DELIGHT, celebrated JUNIORS, Individual and Single Generator Burner Stoves, &c., will give our trade a decided advantage over their competitors,

Write for Catalogue, 1895.

—THE—

Dangler Stove & Mfg. Co,

CLEVELAND, O.



WHOLESALE AGENTS:

E. H. Huenefeld, Cincinnati, O.
Standart Bros., Detroit, Mich.
Mt. Penn Stove Works, No. 111 N. 2d St., Philadelphia.
Mt. Penn Stove Works, Reading, Pa.
Barstow Stove Co., No. 228 Water St., New York.
Barstow Stove Co., No. 56 Union St., Boston.
Home Stove Co., Indianapolis, Ind.
Denver Stove & Hdw. Co, Denver, Colo.
J. P. Lindeman & Sons, Milwaukee, Wis.
R. Robinson & Sons, Chicago, Ill.
Richards-Conover Hdw. Co., Kansas City, Mo.

The Stollberg-Clapp Co., Toledo, O.
Weber & Gebhart, Dayton, O.
Bradley & Munk, Columbus, O.
Foster-Stevens Co., Grand Rapids, Mich.
The Schaab-Puff Stove Co., St, Louis, Mo.
Dunlay & Geisler, Houston, Texas.
The Wooldridge Stove Co., Memphis, Tenn.
A. Baldwin & Co., Ltd., New Orleans, La.
M. F. Tallmage, Buffalo, N. Y.
W. E. Galbreath, S. E. cor. Lombard and Light Streets, Baltimore, Md.

TROPIC

VAPOR STOVES

TWELFTH SEASON

OVER 100,000 MANUFACTURED

NINETEEN DIFFERENT SIZES AND STYLES,

INCLUDING A FULL LINE OF

Evaporating Sheet Steel Vapor Stoves.

Evaporating Cast Frame Cabinet Ranges.

Hot Generating Full Size Stoves.

Hot Generating High Junior Stoves.

Hot Generating Low Junior Stoves.

DON'T BUY A VAPOR STOVE Until you have seen our New Patterns for 1895.

SAMPLES NOW READY AND CATALOGUES FURNISHED ON APPLICATION.

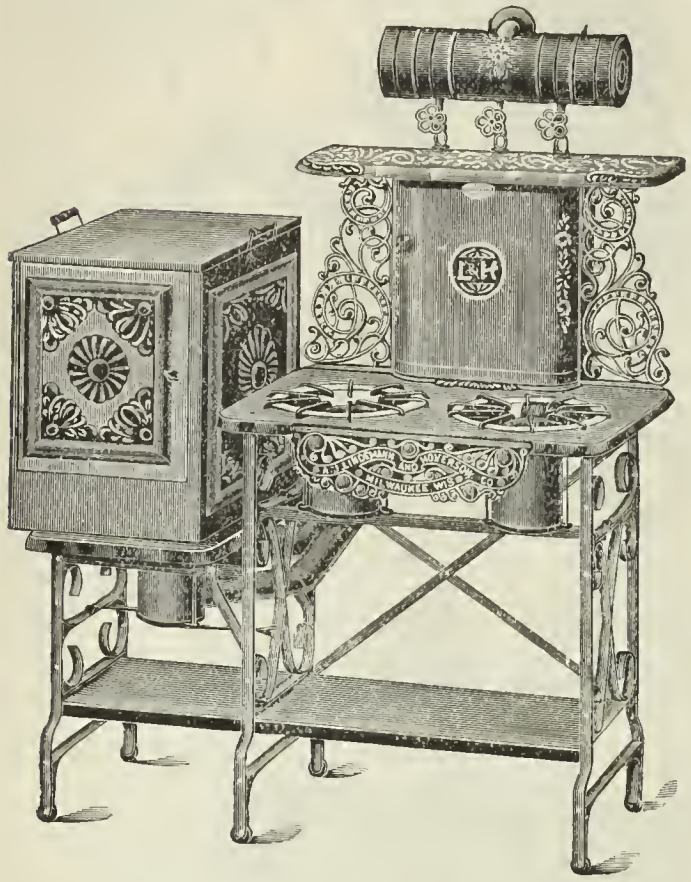
RATHBONE, SARD & CO.,

ALBANY, N.Y. CHICAGO, ILL. AURORA, ILL. DETROIT, MICH.

L. & H. STOVES

FOR

GASOLINE, GAS and OIL. (Kerosene.)



The most Complete Line, Latest Designs, Best Workmanship, Finest Appearance.

Our assortment includes Juniors, Individual Burners, Single Generators, Evaporating Process, Gas Ranges, Hot Plates, Lamp Stoves and Oil Cooking Stoves.

Write for Catalogue and Secure Agencies.

A. J. LINDEMANN & HOVERSON CO., Milwaukee, Wis.

"GOVERNOR" GASOLINE STOVES "PRINCESS"

We are pleased with the prospects of the coming Gasoline season.

Since the Dealers have seen our Stoves and convinced themselves that we manufacture and carry

The Most Complete Line, the Finest Appearing and Best Working Gasoline Stoves,

Inquiries and orders are pouring in on us. This is very gratifying and at the same time nothing unusual, as the intelligent buyer will at all times avail himself of an opportunity to get the best at the same price.

And we certainly insist that our Gasoline Stove is the best in the Market.

Our Illustrated Catalogue is ready and will be sent on application.

Send for Discount and Secure Territory.



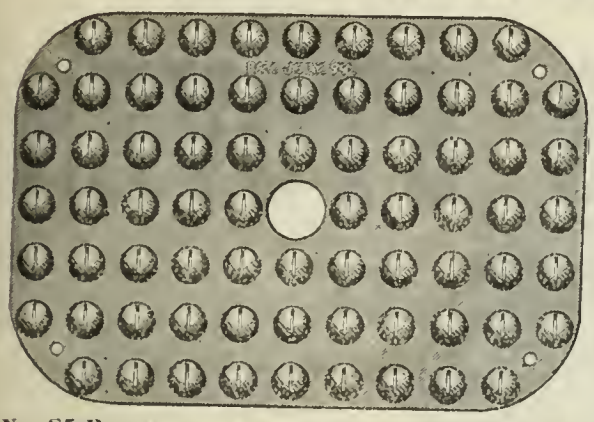
Western Stove & Mfg. Co.

MILWAUKEE, WIS.

CHICAGO OFFICE: Room 73, 88 & 90 Washington Street, T. J. DUFFY, Jr., Sales Agent.

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.



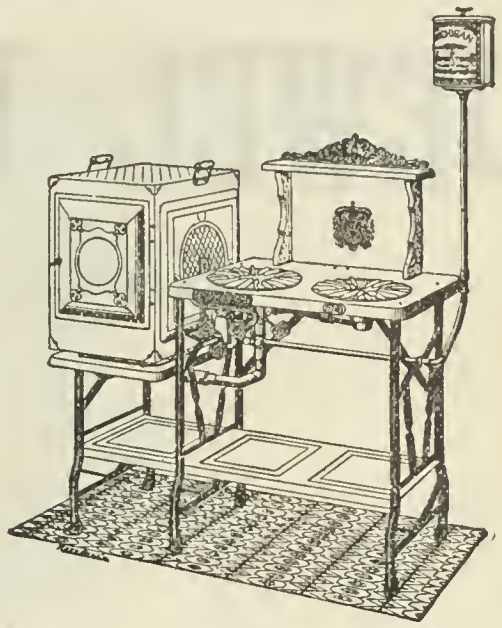
No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*

OUR JET CONE BURNERS

distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

and

SPECIAL JUNIORS.

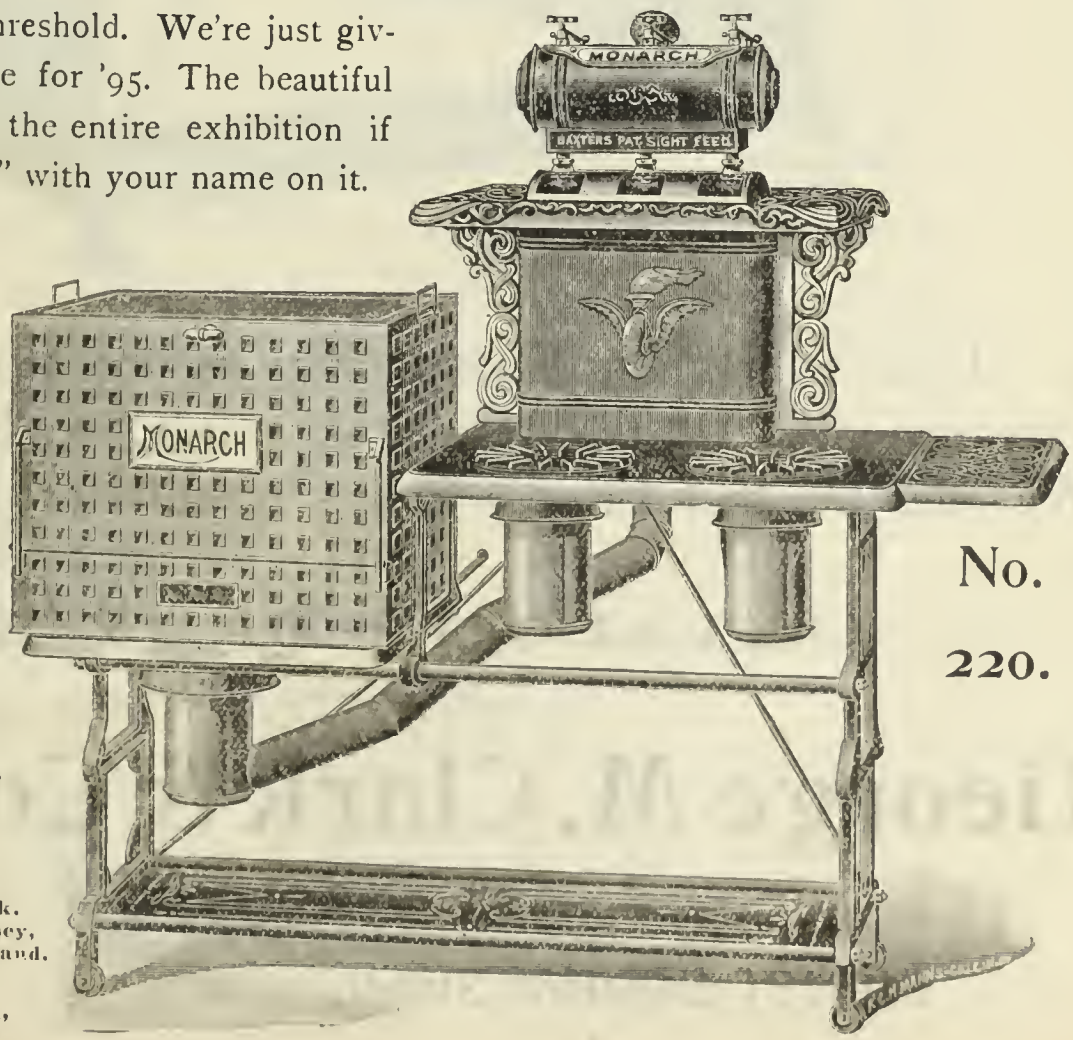
Another Corker.

And yet this is only on the threshold. We're just giving you a peep at the new line for '95. The beautiful new catalogue will show you the entire exhibition if you "drop a card in the slot" with your name on it.

THE

Monarch Stove Co.,

Mansfield, Ohio.



No. 220.

AGENTS:

E. H. HUENEFELD, Cincinnati, O. — Ky., Tenn., So. Ohio. So. Ind.

COOK RANGE & STOVE CO., Chicago, Ill., — Wis., No. Ill.

DANVILLE STOVE CO., Danville, Pa., and 284-286 Pearl St., N. Y. — Penna. New York. New Jersey, New England.

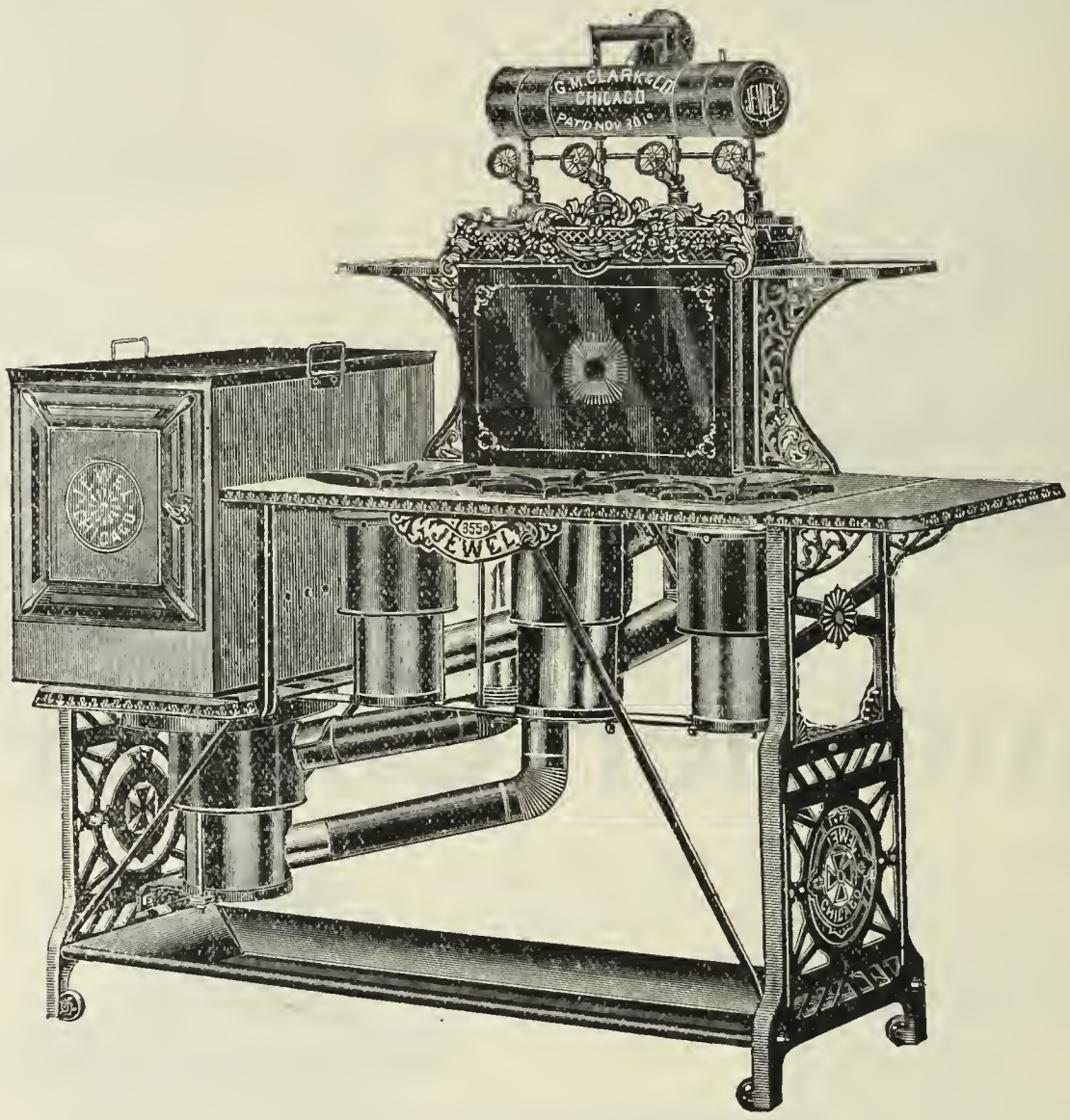
THE ZAHNER & BATTELL MFG. CO., Kansas City. — Missouri, Kansas.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

CATALOG READY SOON.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

WALKER & PRATT MFG. CO.,

MANUFACTURERS:

31-35 UNION ST., BOSTON.



One thing is certain, the "Culinet" is new. It's different from anything you ever saw. It fairly bristles with points, and they are not the same old points that have been talked for years. They are new points, because the "Culinet" is a new stove.

The "Culinet" is the most sensible cook-stove in the world. And the most convenient. The reasons cannot be told here, but they are good reasons. People are talking about the "Culinet" more than any stove for ten years. That kind of a stove will sell; it has sold already; and people who use it praise it.

This year's leader is

WALKER'S

Culinet

IMPORTANT ANNOUNCEMENT.

To Our Patrons and the Trade Generally:

Our new Catalogue for 1895 will be ready for distribution within a few weeks. We take this means of announcing in advance of its publication that we have very carefully studied the requirements of the trade in every particular, and that our lines will be complete. We will place on the market specialties in entirely new goods that will commend themselves both by reason of popular prices and their many attractive and desirable features. In addition to our very popular Oilgas Cook Stoves, containing our improved 1895 Burners that are giving such perfect satisfaction, we have something entirely new in the line of special Lamp Stoves at special prices; also Sheet Steel Circular Burner Oil Cook Stoves. Write for further information and prices.

CENTRAL OILGAS STOVE COMPANY,

—Manufacturers of—

Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes.

BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.

"What signifies you Patience, if you can't find it when you want it?"—Franklin.

What signifies that

Ferrosteel produces smooth castings.

Ferrosteel has great strength.

Ferrosteel is not liable to warp.

Ferrosteel has no equal for stove construction.

Ferrosteel Ranges are made of **Ferrosteel.**

Ferrosteel has unusual heat-receiving properties.

Ferrosteel has great powers of expansion and contraction.

Ferrosteel will stand the strain of extra hot fires without giving out.

If you never see a range made of **Ferrosteel?**

Additional Sizes for 1895.

Please write for particulars to

THE FERROSTEEL COMPANY,
Wade Building,
106 & 108 Superior Street,
CLEVELAND, OHIO.

Model Works at
CHAGRIN FALLS, OHIO.
(10 Miles from Cleveland.)



Simplest, Safest, Best.

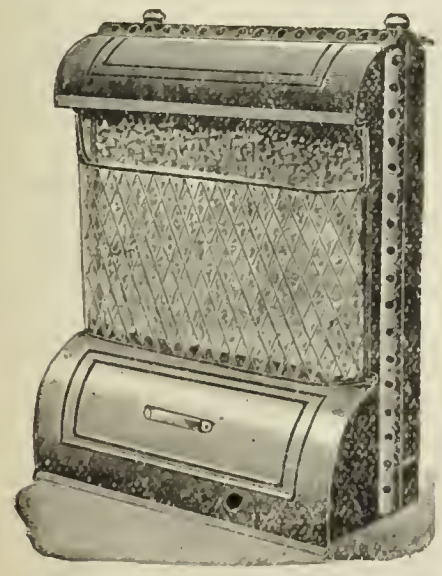
Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



HOW TO REDUCE NATURAL GAS BILLS.
THE "PITTSBURG" GAS STOVE DOES IT.

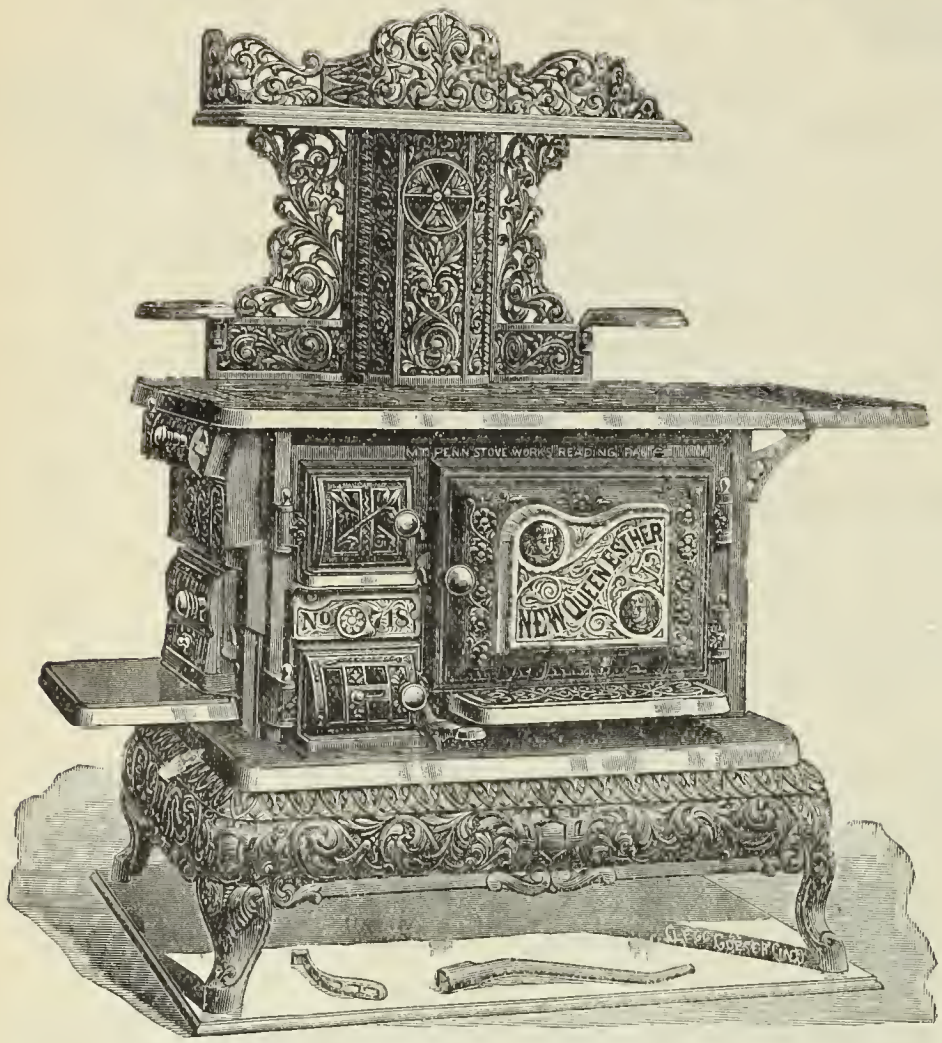
Pronounced by Experts and Users to be the Cheapest, Best and Most Economical Gas Stove in the market. The secret of its success is not only in burning the gas perfectly, but in preventing any of the poisonous gases (the waste product of combustion) from escaping into the room, and yet extracting all the heat from the gas. **No waste heat passes into the chimney, but only the waste product of combustion.**

By making slight changes in burner this stove can be used for Artificial Gas also. If wanted for such purpose, please order "for Artificial Gas."

Full information cheerfully furnished. Manufactured exclusively and **for jobbing trade only,** by

DIXON-WOODS COMPANY, - Pittsburg, Pa.

OUR NEW QUEEN ESTHER

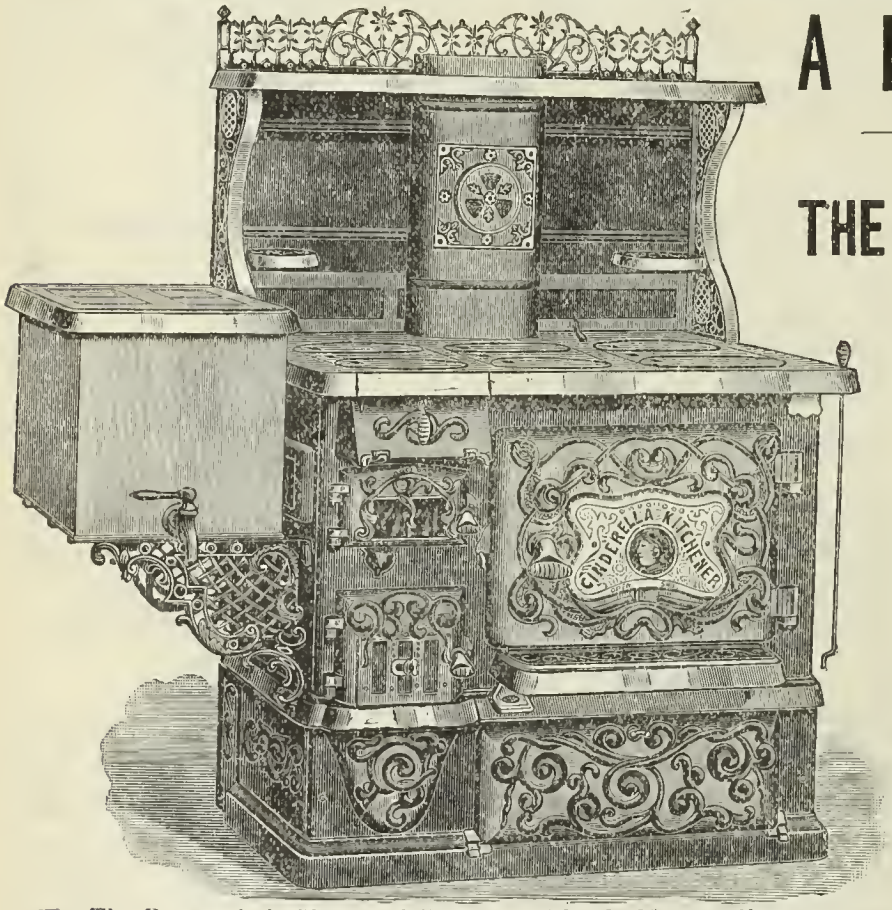


A Range embodying so many points of excellence as to carry its own recommendation to the thrifty housekeeper. Here are some of them:

Tin lined oven doors.
Patent pedal oven door opener.
Large broiling or feeder door.
Convenient flue clean-out.
Extra large flues.
Automatic or duplex grate.
Hot air attachment for auxiliary heating.
Provision for fire-box extension when burning wood.
Adaptability to coal or wood fuel.

The others we will mention on receipt of your postal.

Mt. Penn Stove Works, Reading, Pa.



The Reservoir is Planished Copper, and holds fifteen gallons.

A FEW WORDS
TO THE PROGRESSIVE DEALER.

THE CINDERELLA KITCHENERS

Are an entirely new series of

ALL CAST IRON RANGES,

Adapted for burning

HARD OR SOFT COAL OR WOOD.

They have embodied in their construction many new and desirable features that are thoroughly practical and will meet the approval of the "up to date" dealers. The Cinderella Kitcheners are also made with feet and skirting in lieu of the Low Closet. A full complement of High Shelves and High Closets accompany the same. Every appointment is the latest, and for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No 716,	Oven 16 x 16,	10½ inches high.
718,	18 x 18,	11½ "
818,	18 x 18,	11½ "
719,	18 x 20,	12½ "
819,	18 x 20,	12½ "
821,	20 x 22,	13½ "
921,	20 x 22,	13½ "

IF YOU ARE INTERESTED WRITE FOR PRICES.

We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

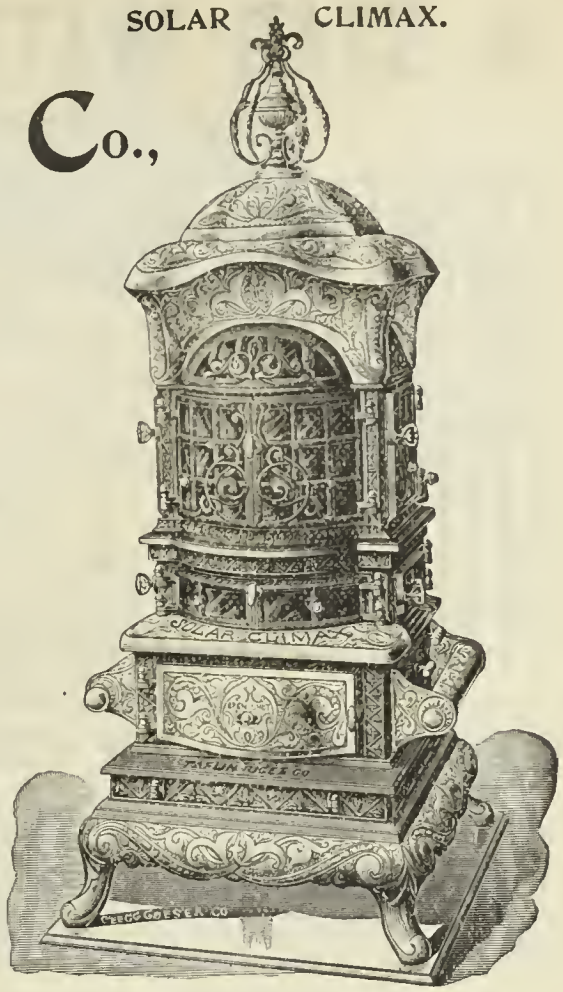
We Would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited - - Pittsburgh, Pa.

ROUND CLIMAX.



SOLAR CLIMAX.



Taplin, Rice & Co.,

AKRON, OHIO,

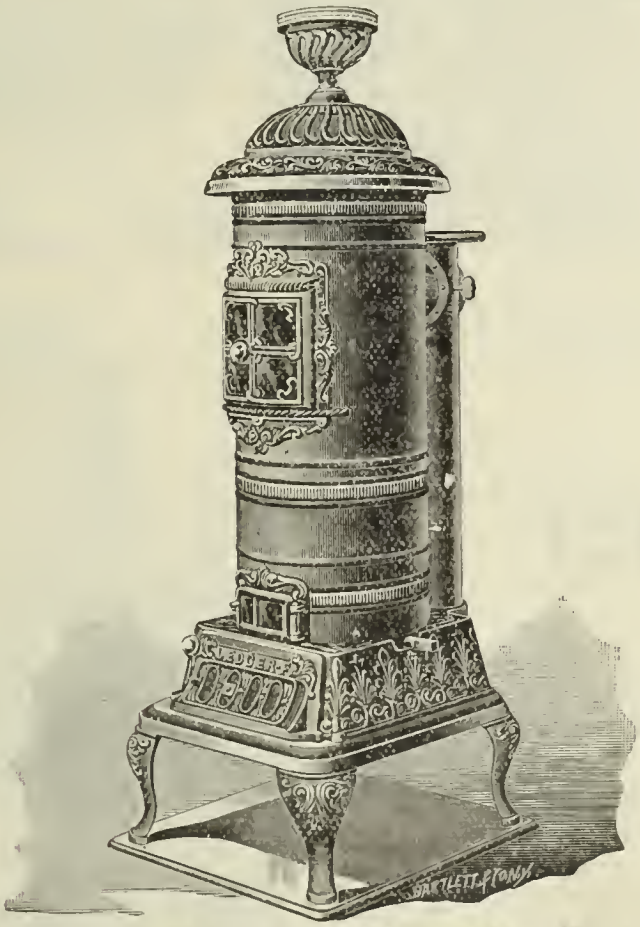
MANUFACTURE established leaders in the line of

COOK and HEATING STOVES

and hereby respectfully solicit inquiries and orders for their specialties.

For Soft Coal and Wood.
Three Sizes: Nos. 14, 16, 18.
Single or Double Sectional Fire Pot.

For Hard Coal.
Three Sizes: Nos. 114, 115, 116.



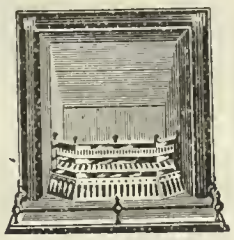
LEDGER F CYLINDER.

WITH REVERTIBLE FLUE. No. 9, No. 10, No. 12, No. 14.

Well made, attractive in appearance and attractive in price. Made both as a plain cylinder and with revertible flue as above. Circulars and prices are worth seeing. Send for them.

THE STAMFORD FOUNDRY COMPANY,

STAMFORD, CONN



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

A Good Army Story.

One of the best army stories I have heard for a long time was told by a Johnstown veteran of the Forty fifth Regiment. The hero of the story is a Jew. The veteran announced one day that he was going to the sutler's quarters, some two miles away, to make some purchases. The Jew, Conn, lying in his tent, heard this, and calling the veteran in, said:

"I give you 50 cents, you buy me tobacco."

The 50 cents was handed over. The veteran made his trip to the sutler's quarters, but could get no tobacco. Instead, he bought 50 cents' worth of cigars, all of which except two he gave away to the boys, and one of those left he smoked himself. The remaining one he carefully wrapped up in half a dozen papers and handed into the tent to Conn. The Jew spent some time in getting all the wrappers off, and was almost paralyzed when he found it contained a single cheap cigar.

"What you do mit mine 50 cents?" said the Jew.

His friend told him the sutler had no tobacco, so he bought cigars. Conn gazed long and earnestly at the small return he had got for his half dollar, and then, looking up at his friend, said:

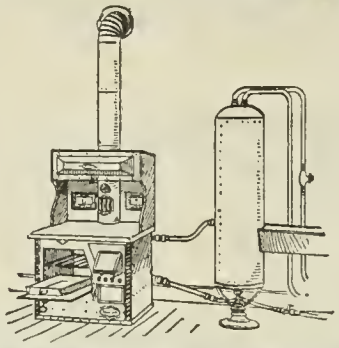
"Vell, de next time I sends a d—n fool for tobacco I goes myself."—*W. J. Press.*

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie. Pa.

★ STAR WATER BACK AND BOILER ★
COUPLERS.

DONT WIPE YOUR JOINTS — SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

NO SOLDER NO BURST — ANY MECHANIC CAN DO IT

WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.
Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada.

LARGEST ASSORTMENT OF STYLES AND SIZES IN THE MARKET.
CORRESPONDENCE SOLICITED. CATALOGUES GIVE FULL DESCRIPTION.

SOLD ON THEIR MERITS NOT ON THEIR ANTIQUITY.

Royal HEATERS. COMBINATION.

HOT WATER. STEAM. HOT AIR.

MANUFACTURED BY HART & CROUSE. UTICA, N.Y.

NEW YORK 211 WATER ST. CHICAGO 79 LAKE ST.

THATCHER

The Celebrated

"Thatcher"

FURNACE and RANGES.

GAS-TIGHT.
DURABLE.
ECONOMICAL.

Also Manufacturers of the

"CHAMPION"

Steam and Hot-Water Heaters.

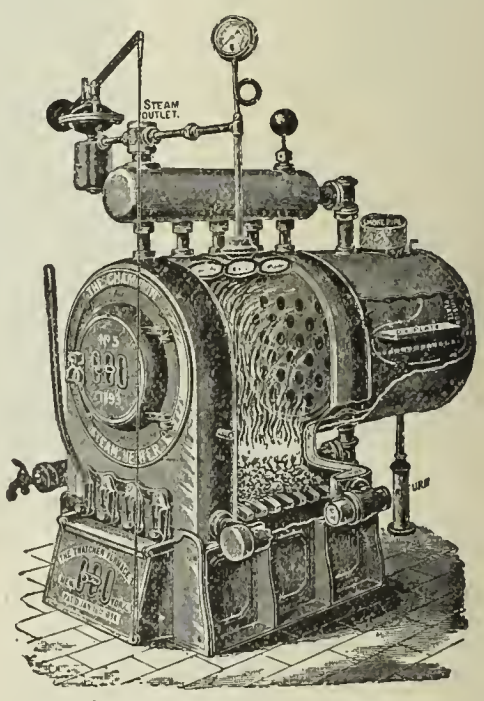
Sold by the trade extensively throughout the country.

Specified by Leading Architects.

Illustrated Catalogue Sent Free.

The Thatcher Furnace Co.,

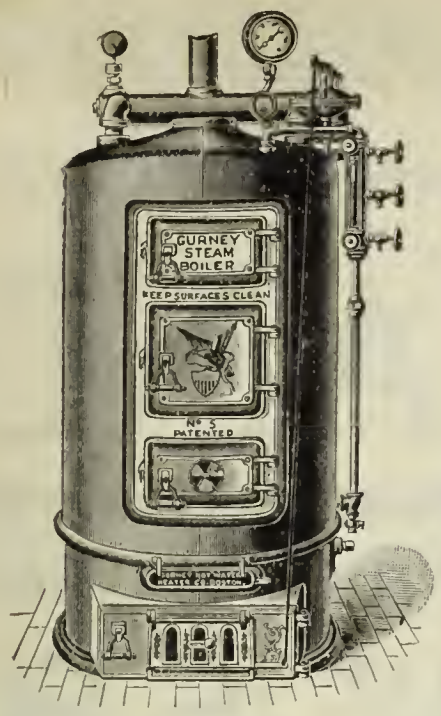
240 WATER ST., NEW YORK.



Champion Steam Heater.

Has advantages over any other Heater.

Send for Circular.



Gurney Steam Boiler.

RESULTS ARE CONVINCING EVIDENCE.

THE GREAT SUCCESS WHICH

Gurney

HOT WATER HEATERS, STEAM BOILERS, RADIATORS,

Have attained is due to the **FACT** that they embody

BEST

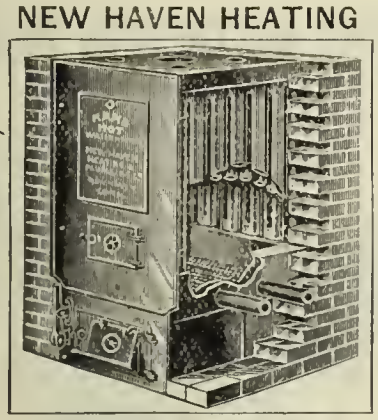
WORKMANSHIP,
CONSTRUCTION,
MATERIALS,
ADAPTABILITY,
IDEAS.

ALWAYS EQUAL TO THE OCCASION.

Send for Catalogues
Sold only to the Trade. **GURNEY HEATER MFG. CO.,** 163 Franklin St. Cor. Congress, Boston, Mass

Selling Agents, A. A. Griffing Iron Co., 34 Dearborn St., Chicago, Western States.

NEW HAVEN HEATING



NEW HAVEN, CONN.

AND PLUMBING CO.

Rapid Hot Water Heater,

Selling rapidly to the Trade only.

MONEY IN IT FOR YOU.

Send for Catalogue, Price-List and Discount.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET, - - - - - - NEW YORK

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**



DO YOU KNOW

That we are the Largest Manufacturers of Steam and Hot Water Heating Apparatus in the World?

WRITE FOR CATALOGUE AND PRICES.

American Boiler Company

94 Centre St., New York **84 Lake St., Chicago.**

It has been said that in America TWO C

"GARLAND

At the very head and front of t

"MICHIGAN" STO

which are unquestionably the latest, hand

a

a

b

n

t

t

c

b

"

—

GARLAND STOVES AND RANGES

"The World's Best"

ASSES of Stoves and Ranges are sold, viz.:

S" AND OTHERS.

"Others" stands our new line of

ES AND RANGES,

omest and most artistically designed stoves
l ranges to be found upon the market, at
ything like the price at which they are sold.

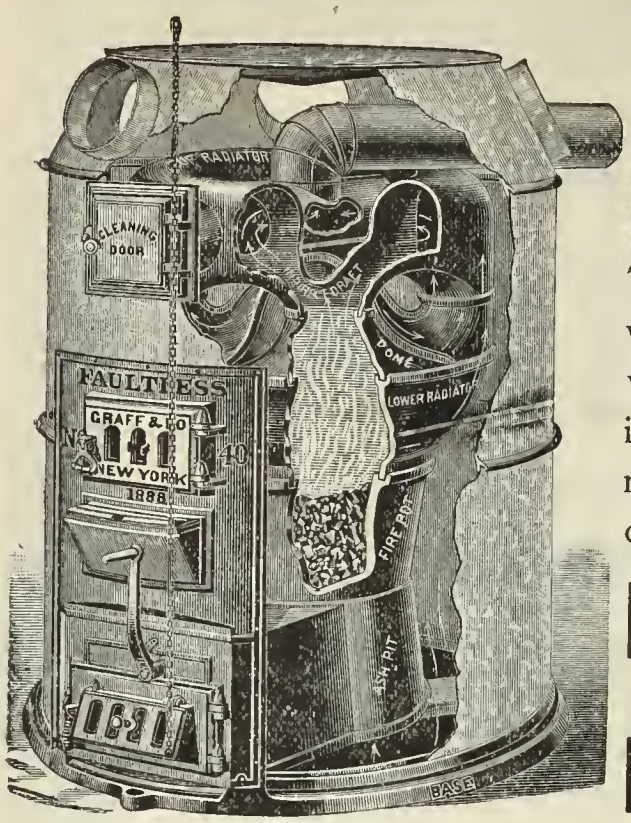
They are made under our own supervision,
the same workmen and out of the same
terial from which "Garlands" are made, and
s fact of itself should be sufficient to cause
em to be preferred by discriminating mer=
ants and consumers, as against all other
ands, excepting the invincible line of
arlands."

The Michigan Stove Company,

Largest Makers of Stoves and Ranges in the World.

ROIT, CHICAGO, BUFFALO, NEW YORK CITY.

FAULTLESS.

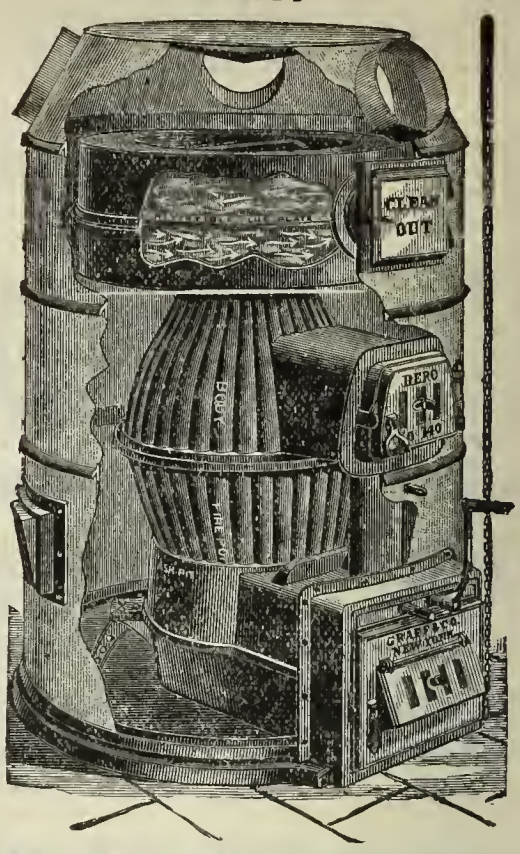


YOU WANT THE BEST FURNACE

That you can buy, and we have got it. You will not be disappointed in any selection you may make from our assortment of

FURNACES OR RANGES.

HERO.



SMITH & BRIGHT,
175-177 Lake St., Chicago, Ill.

GRAFF & COMPANY, Manufacturers,
208 Water Street, New York.

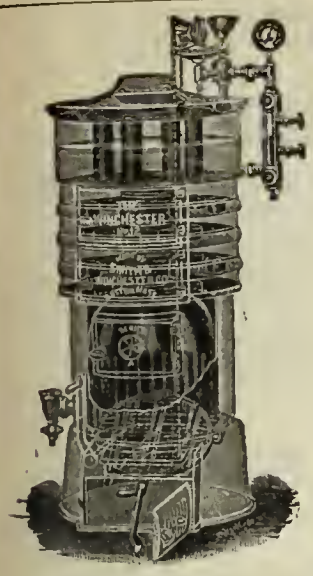
FURNACES

The TRIUMPH Series.
"There are none better."

Mfd. by
The Craig-Reynolds Fdy. Co.,
DAYTON, O.

GEO. D. HOFFMAN,
Mgr. Western Branch,
82 LAKE STREET, CHICAGO,

Patent *STEEL* Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



The Winchester



Has more ***COMMENDABLE***

And less ***OBJECTIONABLE FEATURES***

Than any Heater on the Market.

——MADE BY——

SMITH & WINCHESTER CO., Boston Mass.

Our prices on these Heaters will please you. Send for them.

KEEP IN MIND



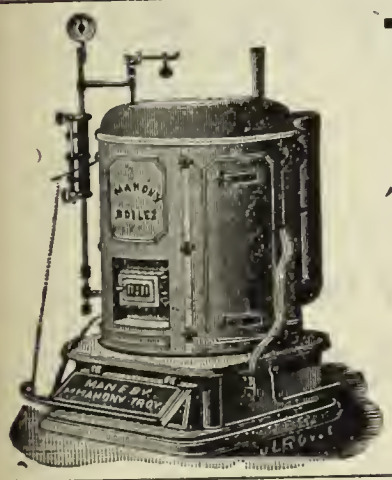
The Plummer
Steam Heater
AND
The Leader
Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,

PUTNAM, CONN.

THE MAHONY BOILERS.



For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.

THE VOLUNTEER

STEAM



For hot water or steam has no superior, and is the only hot water boiler that is **SELF REGULATING.**

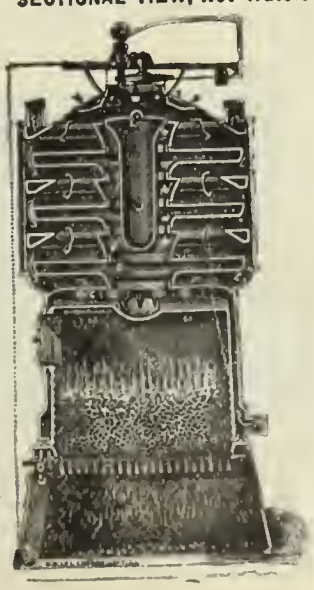
Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Street.

SECTIONAL VIEW, Hot Water.



Blacking for Iron.

For coloring iron and steel a dead black of superior appearance and permanency the right article has long been sought, and to meet this want M. Mazure now proposes a fluid, of which, according to the New York *Sun*, the following is the formula: One part bismuth chloride, 2 parts mercury bichloride, 1 part copper chloride, 6 parts hydrochloric acid, 5 parts alcohol and 50 parts water, these being, of course, well mixed. To use this preparation successfully—the article to be blacked or bronzed being first made clean and free from grease—it is applied with a swab or brush, or, better still, the object may be dipped into it; the liquid is allowed to dry on the metal and the latter is then placed in boiling water, the temperature being maintained for half an hour. If, after this, the color is not so dark as is desired for the purpose, the operation is simply to be repeated, and the result is in the highest degree satisfactory. After obtaining the desired degree of color the latter is fixed, as well as much improved generally, by placing for a few minutes in a bath of boiling oil, or by coating the surface with oil and heating the object until the oil is completely driven off. The intense black attained by this easy method is said to be admirable.

— ON THE ROAD TO DALLAS.—They were talking about Texas.

"Oh, yes, I have been down there," said the traveler, "and I remember it very well. I ought to remember it. I was invited to 'git into' a little game of poker, and when I got up from the table I hadn't a dollar in my pockets, not a cent."

"Of course," said some one who was a believer in hospitality, "they entertained you and then gave you a ticket to your home."

"Oh, no," answered the traveler, thoughtfully. "The man who owned the house in which we were playing left the room when I announced that I was broke. Presently he returned with a lantern and beckoned to me to follow him. I stepped out of the room, going carefully so as not to disturb the players. My host led me out the front door to the road. Placing the lantern in my hand, he pointed into the blackness of the night.

"'Here is a lantern,' he said, 'and this is the road to Dallas.'

"Dallas, my friends, was 160 miles away."—*New York Tribune.*

— "ALAS!" exclaimed Fogg, striking his empty pocketbook. "Would that man were like pie crust; then the shorter he is the richer he would be."—*Boston Transcript.*

Mistakes of Novelists.

All novelists and writers make slips or blunders in greater or less abundance, says a writer in *Pearson's Weekly*, but it is among the lady novelists that the most frequent and amusing blunders must be looked for, and in "Ouida's" works they abound with greater frequency than in the works of any other living novelist. In one of them will be found a horse winning the Derby three years in succession; guardsman sitting up all night drinking hard, smoking perfumed cigarettes, gambling for fabulous sums, and starting forth in the morning, after a breakfast of ortolans and green chartreuse, fresh as a daisy, and prepared to do deeds of prowess in the hunting fields or at the covert side—and that great feat, too, performed by a man with a "tawny mustache and flanks like a greyhound," who, while snipe shooting, espies an eagle, "a dim speck in the ethereal vault." What cares he that his cartridges only contain tiny snipe shot? Not he! He bangs away with unerring aim, and "slowly the king of birds, with his glorious pinions outstretched, sinks at his feet a corpse." In another of her books a gentleman performs a similar feat, but this time, for the sake of variety, with a rifle bullet. Walter Besant, in his novel "St. Catherine by the Tower," speaking of the riverside inhabitants, says: "They go to church but three times in their lives—when they are baptized, when they are married, and when they are buried." It is only people in novels who go to be buried during their lives. Rider Haggard, in his "King Solomon's Mines," made an eclipse of the moon take place at the new moon instead of at the full, when the earth is between the sun and the moon.

— THE CZAR'S RUSSIAN DOCTOR.—Dr. Zacharin, who treated the Czar, is known as one of the most impolite men—to use no stronger expression—in his profession. He is a fierce democrat and has respect for no one. Like Professor Schweninger, the physician of Bismarck, he insists upon the literal execution of his orders, it matters not who the patient may be, and will brook no interference. He is a man of middle age and began life as a butcher boy. He has become one of the richest men in Russia by his practice.

When the malady of the Czar began to look serious the Emperor at once asked that Zacharin be sent for. A telegram was dispatched to the Governor of Moscow, says one of the imperial attendants in the Copenhagen "Politiken," ordering him to send Zacharin to St. Petersburg. The Adjutant of the Governor found the Professor in his clinic, and asked him to make as rapid preparations as possible, as the fast train would leave the city for the capital in a few hours.

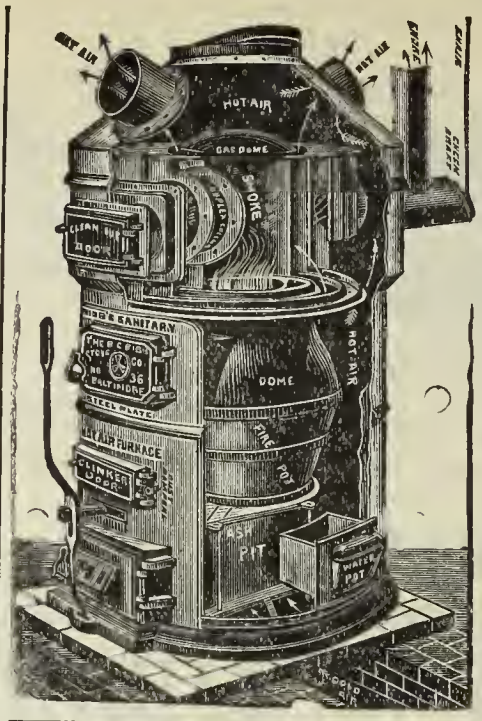
"The fast train? What?" was the Professor's answer. "The Emperor of Russia is sick, and you talk of the fast train! Will you kindly order me an 'extra,' which must be ready in half an hour."

At the time appointed he started for St. Petersburg, and, arriving there, hurried with an adjutant to the castle.

"His Majesty awaits you, Professor," said a chamberlain who received him at the entrance. "Your rooms are at the head of the stairway, and you will find everything in readiness to make your toilet after the journey."

"Toilet!" answered the physician. "His Majesty is sick and wants my advice, not to see me in 'toilet.' Take me to him at once."

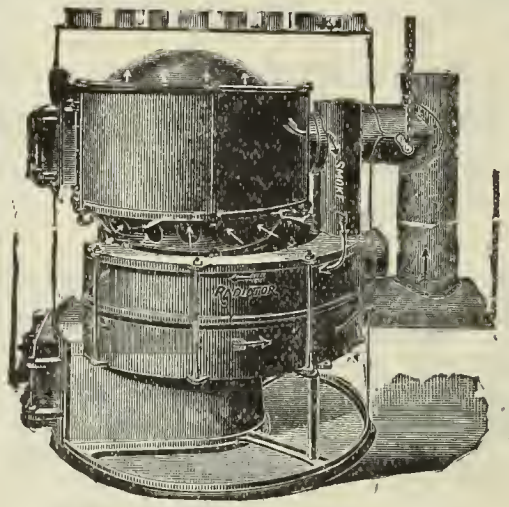
The Emperor was lying in bed in a dark room. All the windows were closed and the curtains were down. The Empress sat in a rocking chair next to the bed. Three body physicians stood about the



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of
THE BIBB SANITARY
HOT AIR FURNACE.

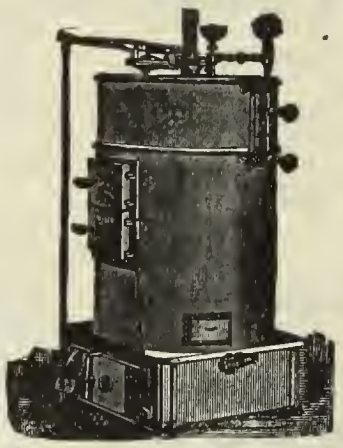
Portable, 5 Sizes; Brick Set, 2 Sizes.
The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also
BIBB'S ORIGINAL
Baltimore Fire Place Heaters,
And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.
Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.
It Is a Base Burner.
It Is a Great Economizer of Fuel.
It Does Not Heat the Cellar
It Is a Low Furnace.
The "Perfect" Ventilator
The "Crown" or "Stasch" Folding Bake Pan.
Agents Wanted. Address—
The CORNING MANUFACTURING CO.,
CORNING, N. Y.

"JUST A LITTLE"



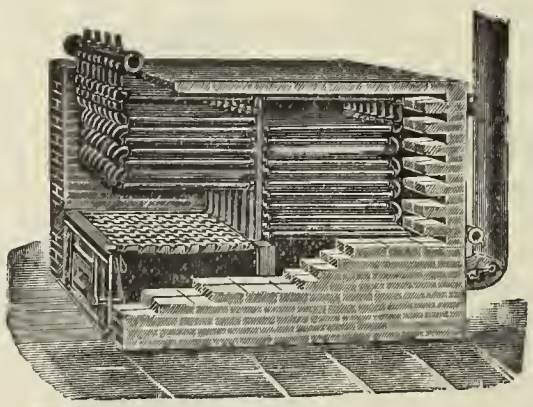
FUEL, TIME, CARE } TO { RUN IT. SET IT UP. MANAGE IT

That's all, and how it does heat!

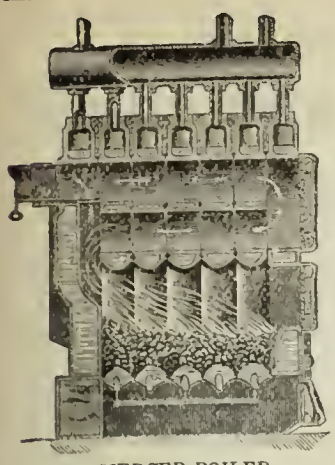
WHAT? Why, the "PAGE."

Further information will cost you the time of writing for our catalogue—it's worth it.

W. C. MOWRY, Lock Box 314, NORWICH, CONN.



The Electric Boiler
—FOR—
Steam and Hot Water Heating and for Steam Power.
MANUFACTURED IN
Over 300 Different Sizes.
SEND FOR CATALOGUE TO
The Electric Boiler Co.,
23 and 25 STILLSON ST.,
15, 17, 19 ACHILLES ST., ROCHESTER, N. Y.
New York Office, 44 Dey Street.



MERCER BOILER.

The H. B. Smith Co.,

MANUFACTURERS OF

Steam and Water HEATING APPARATUS,

For Public Buildings and Private Residences.

SPECIALITIES:

MERCER'S Patent Improved Sectional Boiler, for Hot Water and Steam Heating, adapted for hard or soft coal.
GOLD'S Improved Sectional Boilers.
MILL'S Improved Sectional Boilers.
THE UNION Hot-Water Radiators
REED'S Improved Cast-Iron Radiators.
GOLD'S Indirect Pin Radiators, with Nipple and Flanged Joints.
BRECKENRIDGE'S Patent Automatic Air-Valves.

Office & Warerooms, 137 Centre St., New York

FOUNDRY, WESTFIELD, MASS.

STEAM HOT WATER WARM AIR
FOR HEATING ALL CLASSES OF BUILDINGS

CAPITOL HEATERS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

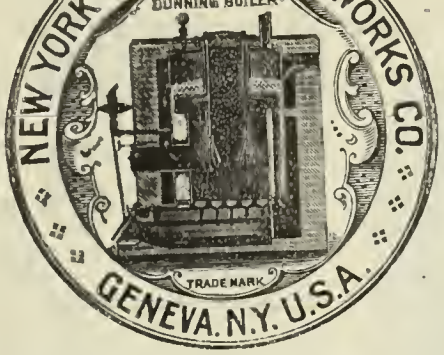
19,000 IN USE.

The Dunning Boilers

Are the Best
—FOR—
Steam or Hot Water Heating.

—o—

Send for Catalogue.



The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

Packed Joints.

The

Portsmouth Stove and Range Co.,

Portsmouth, O.,

beg to inform the trade that they have purchased all the soft coal Retort "DENMARK" Patterns of the Ransom Stove Works, Albany, New York, and all the "LION" Retort Patterns of the Favorite Stove & Range Co., Piqua, O.,

Makers of
The Celebrated
"Model"
Steel Ranges,

and now own all the patents covering these constructions, and will have some novel things in heaters ready for the trade next fall, based on this method of burning soft coal.

Repairs for both of these stoves can now be purchased from us.

room. Zacharin entered the room, made his obeisance to the imperial pair, but almost totally disregarded the presence of his colleagues.

"What an atmosphere! It is disease breeding. And in this atmosphere you allow Russia's sick emperor to lie? Quick! Put back the curtains and raise the windows." Such was his first order.

He then became silent, and began a thorough examination of his patient. Then, taking a chair, he rested his arm on his knee and began to think. Almost ten minutes passed without his uttering more than a half dozen words. As the other physicians, who apparently did not like his action, began to talk softly to one another he rapped with his pencil and told them to "be still."

The year before when the Emperor was suffering from influenza, Professor Zacharin was called also to the palace of the Czar. Upon his arrival, with his assistant, the doctor was asked to take a suite of rooms on the third story. Zacharin refused to be housed there. He had the habit, he said, of always sleeping on the ground floor, and did not wish to change his habits. It was bad for the health. He had his way and was led to chambers on the first floor.

The Czarina, wishing to show her friendly interest in the physician, invited him to take his meals with the family at the imperial table. To this Zacharin replied:

"I never eat with women, Your Majesty."

He insisted upon being served in his rooms, and the good natured Empress allowed him to have his way.

One day the Czarina, believing that the evil from which the Czar suffered was increasing, descended to the room of the doctor and begged him to examine the temperature of the patient and see if it were not higher.

"My assistant," replied the autocratic physician, "will go examine him."

A little later the assistant returned to the rooms with the announcement that there had been no change in the temperature of the sick ruler.

"You see, Your Majesty, that it is not worth while to disturb me."

The doctor was accustomed to go about the palace in the early mornings wearing a gown and the felt slippers of a peasant. But no one ever dared to call him to account.

The doctor gives away large sums of money yearly to the poor. Poor students he always treats free of charge. But when he finds a rich patient he makes him pay for all that he has lost.—*N. Y. Tribune.*

— THE REAL DANGER.—One of Detroit's budding hunters, a youth of 22 summers, went the other day to a veteran in that line to borrow his gun and dog for a day's outing.

"I'm sorry," said the veteran, with a very palpable note of doubt and fear in his voice, "but I can't let you have them."

"Why not?" asked the young hunter, bridling at the imputation on his skill.

"Because I'm afraid something might happen."

This made the young man real mad.

"You talk," said he, "as if you were afraid I might shoot myself."

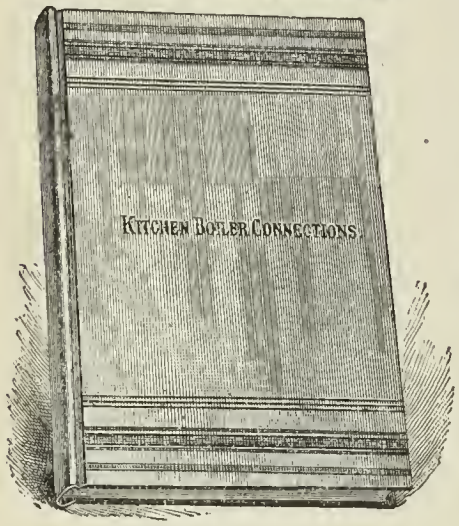
"No," protested the veteran earnestly, "it isn't that. What I'm afraid of is that you might shoot the dog," and the young hunter turned his back on the veteran in a towering rage.—*Detroit Free Press.*

— "PARKER uses a great deal of cologne, it seems to me. Awful bad form!" said Hawkins.

"It would be in you," said Hicks, "but it's family pride with Hawkins. He comes of old colognial stock."—*Harper's Bazar.*

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth, Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

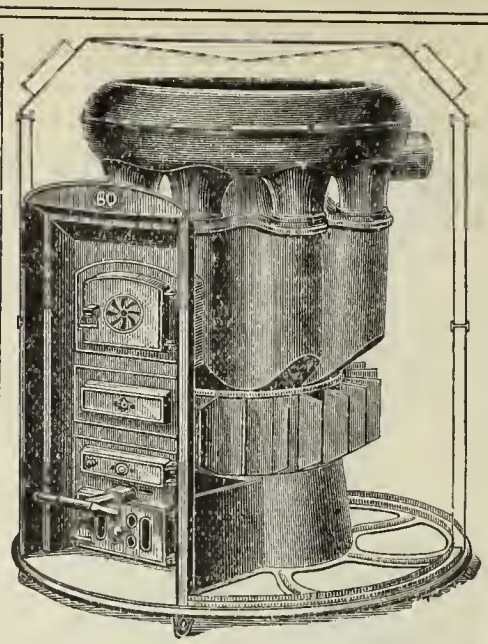
Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome.—*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK.



CORY'S

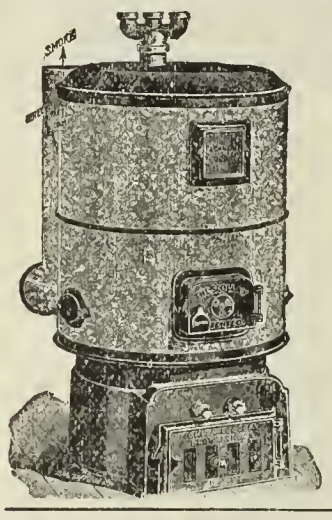
ALL CAST IRON GAS-TIGHT FURNACES.

The purchaser will never ask if this is the *best* quality made, as all dealers understand the "Cory Furnace" to be only of *cast iron*, without bolted joints; gas-tight and durable. Quality exactly the same in twenty sizes from $35 to $125.

UZAL CORY & CO.,

210 Water St., New York.

Estab'ished 1847.



THE

Scollay Hot Water Heater

For Warming Dwellings, Stores, Offices, Churches, Public Buildings, &c.

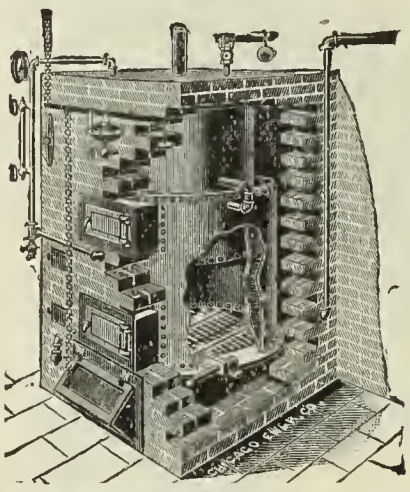
Also Boilers specially constructed for Greenhouses, Conservatories, Baths, Laundries, &c.

SEND FOR ILLUSTRATED CATALOGUE AND PRICE-LIST.

JOHN A. SCOLLAY,

89 and 91 Centre St., NEW YORK.

74 & 76 Myrtle Ave., BROOKLYN, N. Y.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use HARD or SOFT COAL.

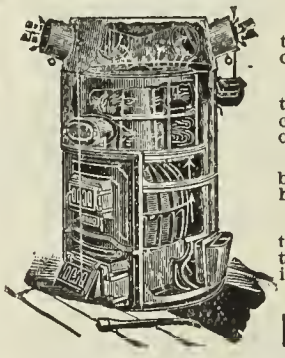
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



WHY IS IT

that the same dealers who sold the **Boomer Furnace** five years ago are still continuing its sale?

DID YOU EVER STOP TO THINK

that one or two years' experience with a poorly constructed light furnace always creates a demand for a furnace that has proven to be the best in the full sense of the word?

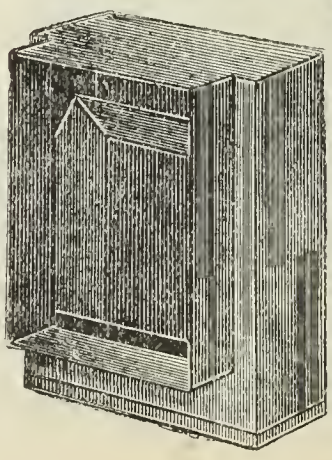
IF YOU WANT TO MAKE MONEY

buy the Improved Boomer Furnace, set it up right, please your customer, and you have the key to your future success.

REMEMBER

that a Boomer Fire Pot has never been known to crack or burn out. That it has the simplest and most effective Gas and Smoke Burner. Guaranteed the heaviest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS. Massillon, Ohio.



Novelty Ventilated Wall Pipe,

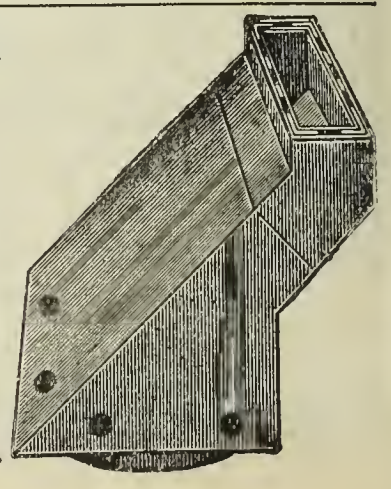
Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER,

18 Wood Street, Pittsburgh, Pa.



1895. SAM S. UTTER,

113 Beekman Street, New York,



Sam S. Utter's
50th year in the
STOVE BUSINESS
and
STILL CROWING.

Offers the best line of Lamp Stoves in three grades. Also the most **POPULAR** and best sellers in the market, such as the

GAME, in four sizes; 1, 2, 3 and 4 Burners, with Tank in one piece. Sam S. Utter's Patent Wick Tube of BRASS, in one piece. An extra first-class stove in every way.

SUMMER GIRL, in three sizes; 1, 2 and 3 Burners, with Tank in one piece and Chilled Iron wick tube. The next best to the **GAME,** but superior to any other.

SOLO.	DUET.	TRIO,	QUARTETTE,
1 Burner.	2 Burners.	3 Burners.	Two Duets and frame.

With Tin wick tubes. Cheaper and better than any other low priced Lamp Stove.

GAME GAS STOVES, with flat tops; two styles, in 1, 2 and 3 Burners.

NEW GAME OIL STOVE.
PARLOR GAME OIL HEATER.

A grand success. A prize **Parlor Heater.**

SAM S. UTTER'S Patent Tops and Bases for Lamp Stoves.

LARGE BUYERS and JOBBERS will find it to their advantage to send for prices and secure territory. Address

SAM S. UTTER,

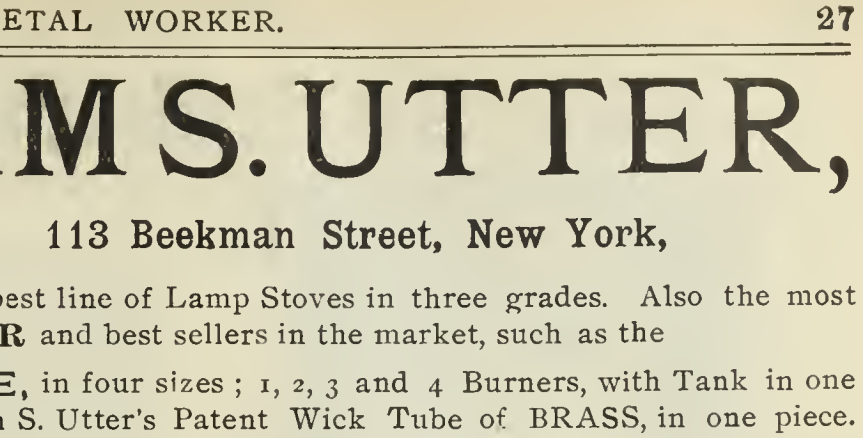
113 Beekman Street, - - NEW YORK.

Gem Stove Truck

Not only accommodates itself to a stove with four legs, but, as shown in illustration, is equally as complete with a stove of three legs, a feature no other truck possesses. The adjustment is so perfect that one man can mount any ordinary stove with ease. Price, $30.00 per dozen. 1-3 doz. in neat case.

DISCOUNT TO THE TRADE.

Address **CHAS. F. FOX, - DAYTON, O.**



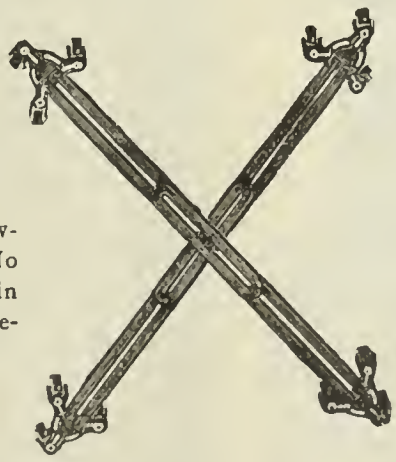
Simplicity, Adjustability, Neatness and Strength.



THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.



M I C A

MICA OF ALL GRADES
—FOR—
Stoves, Electrical and Mechanical Purposes.
PALERMO MICA CO.,
Miners and Importers and Wholesale Dealers,
S. T. PECKHAM, Sales Mgr. **27 Peck Slip, New York.**



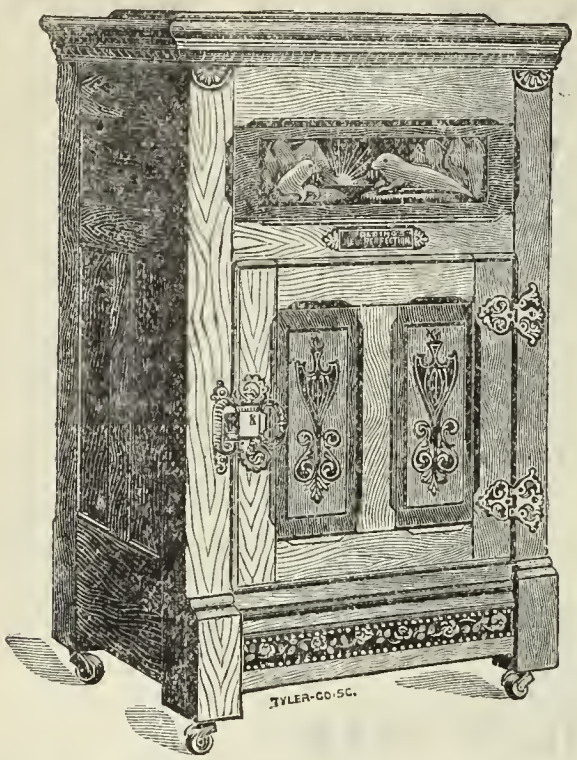
—Boggs (pathetically): "Good-bye, wife, I have to go on jury duty."

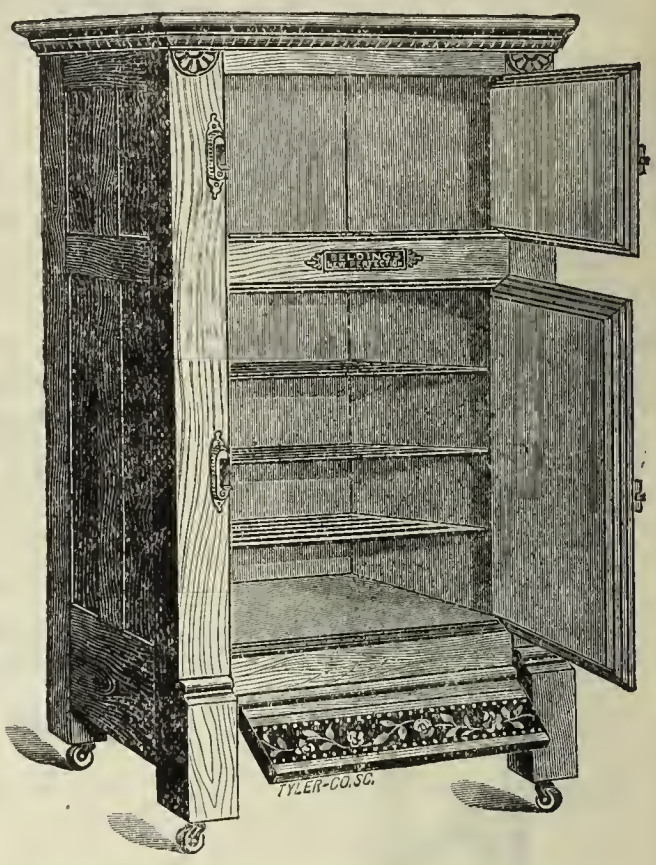
Mrs. Boggs (tearfully): "Now, be back as soon as you can." Don't belong to the 'obstinate eleven.'"—*New York Sun.*

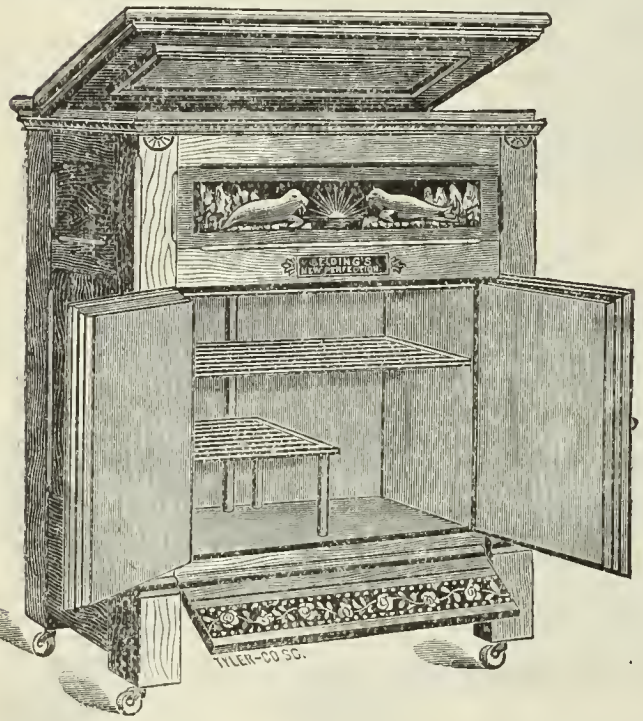
—"HAVE you an acquaintance with Blank?"

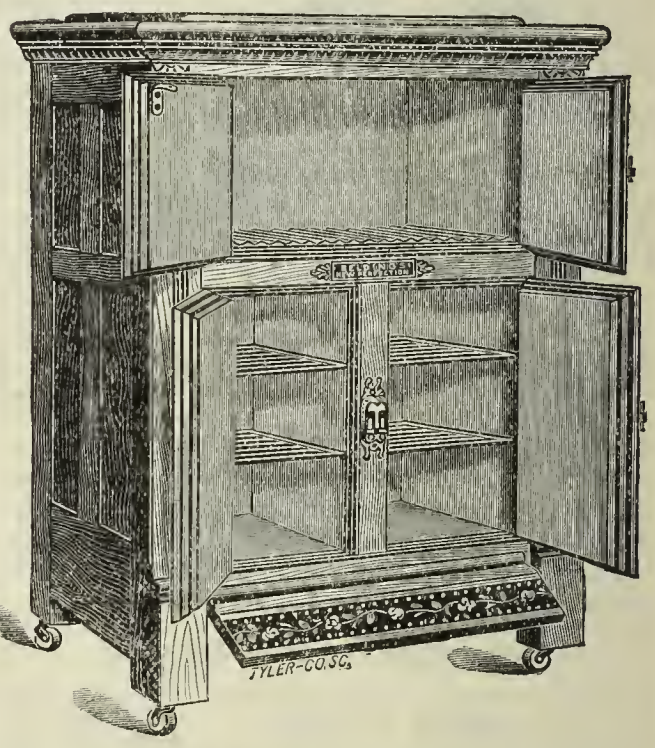
"Blank? Oh, yes. We come down in the same electric car every morning. In this way we are thrown together a great deal."—*Elmira Gazette.*

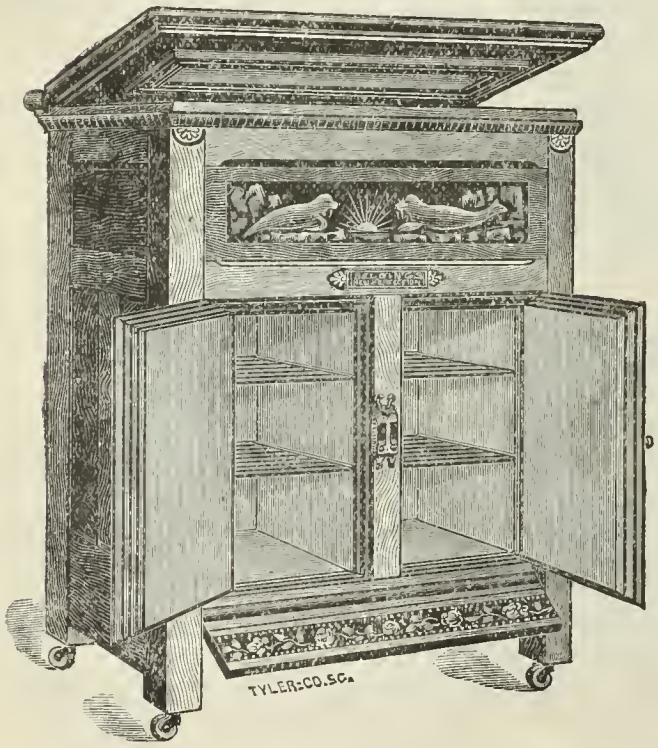
BELDING'S REFRIGERATORS.

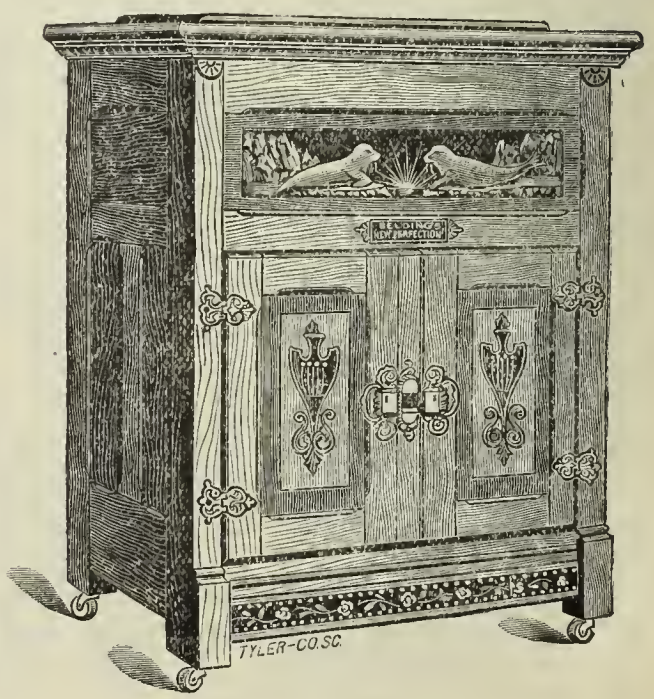




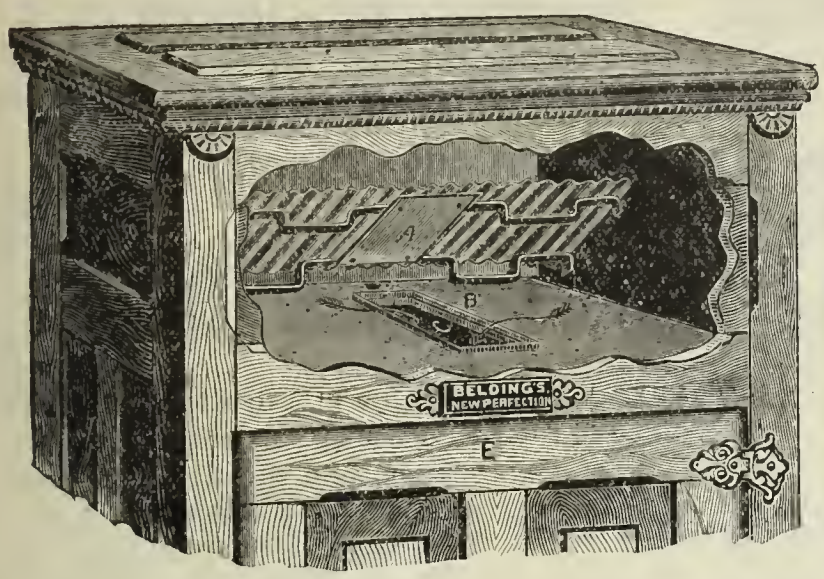




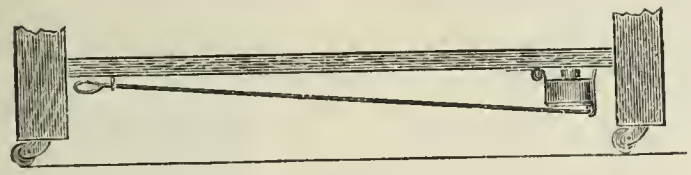


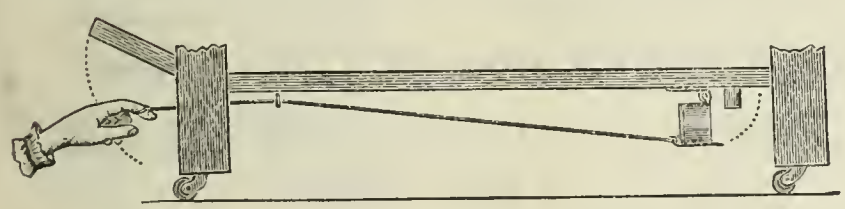


See Points of Excellence Over Others.



Patent Applied For.





OUR NEW AUTOMATIC COLD AIR DAMPER ATTACHMENTS.

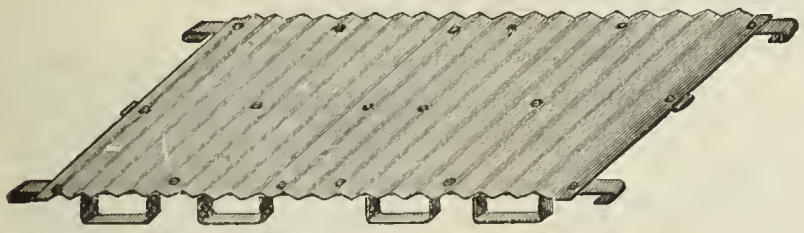
This cut shows a section of our Refrigerator with the New Automatic Cold Air Damper closed.

A—Represents Metal Ice Rack.
B—Bottom of Ice Compartment.
D—The **New Automatic Cold Air Damper.**
E—Door of Provision Chamber.

When the door of the Provision Chamber is opened the Cold Air Damper *immediately* closes the opening through which the cold air drops, thereby *instantly stopping the circulation* in the Refrigerator. Then, as the cold air in the Ice Compartment *cannot escape*, it is impossible for warm air to enter it through the flues in the sides of the Refrigerator; therefore, while the door of the Provision Chamber is open *no ice is wasted, no cold air escapes* and *no warm air enters* the Ice Compartment or *comes in contact with the ice.*

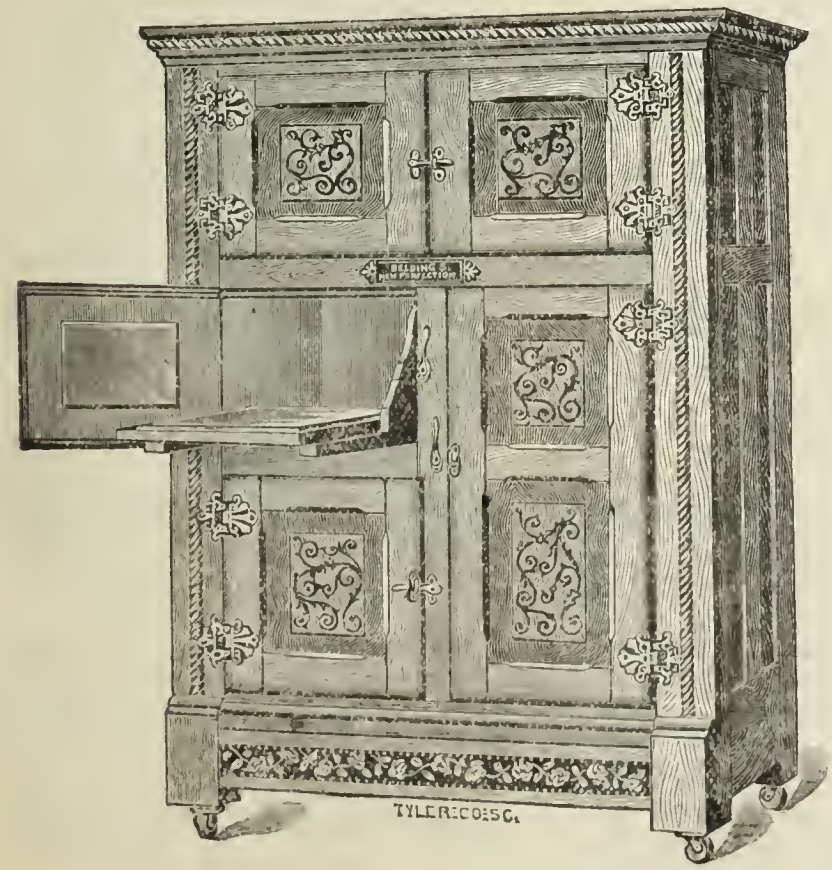
Thus it is clearly shown that this improvement is a *practical* one and makes our Refrigerators *consume less ice* than any that are now on the market.

OUR NEW DRIP CUP ATTACHMENT.



SOLID METAL ICE RACK.

No wood cleats to get water soaked and tainted.



All refrigerators **hardwood, antique finish.** We carry large stocks at all of the following places:

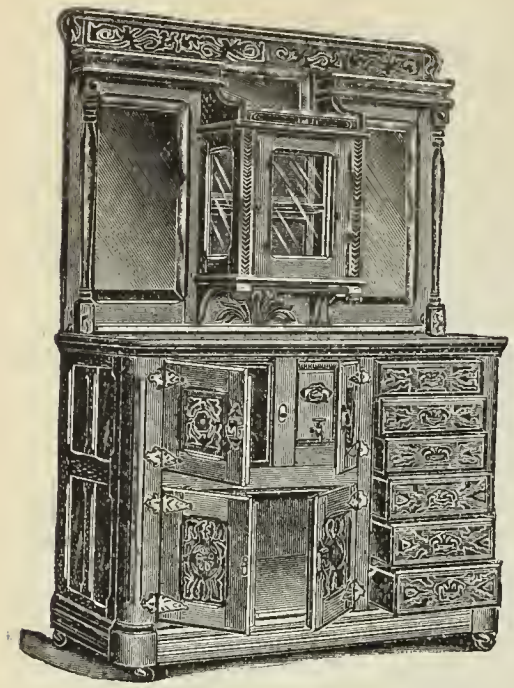
Belding Manufacturing Company.

Factories, Belding, Mich.

SALESROOMS AND WAREHOUSES.:

Chicago, 223 5th Avenue.
New York, 260 Canal Street.
Philadelphia, 249 So. 2nd Street.
Boston, 90 Canal Street.
Holbrook, Merrill & Stetson, San Francisco and Sacramento, Cal., Pacific Coast Agents.

SEND FOR ILLUSTRATED CATALOGUE.



GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co , Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.
Lee-Clarke-Andreesen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Wm. Miller Range & Furnace Co., Cincinnati, O.
Doggett Dry Goods Co., Kansas City, Mo.

BUY THE BEST.

—THE—

Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,

GRAND HAVEN, MICH., U. S. A.

Write for our large Illustrated Catalogue for 1895.

All our goods are made of thoroughly kiln dried ash, finished in antique with Shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups All Refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

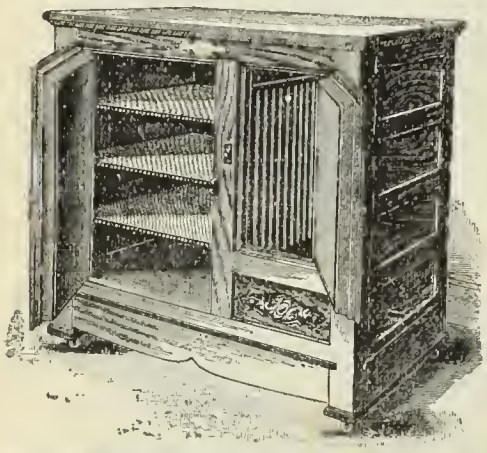
THE CHALLENGE ICEBERG,

THE ∴ HONEST ∴ RELIABLE ∴ REFRIGERATORS,

SELL THE BEST.

The Automatic Refrigerator

has more good points and does better work than any other and for that reason is a better seller. Our illustrated catalogue for 1895 te ls all about the line. Its advantages are:



Perfect circulation.
Large condensing and purifying capacity.
It has no flues to cause it to smell bad.
The trap is inside where it cannot be misplaced or lost.
The drip pipe may be cleaned without disturbing anything in either chamber, and is entirely out of the way
It has nine walls to protect the ice and to maintain a uniform temperature in the cooling chamber.
It has woven wire provision shelves that are superior.
It has superior hardware.
It is more capacious and convenient.
Flavors of foods will not mix.
Last but not least, it's different, and will bring new customers and new trade.

We want the leading dealers to sell our goods and but one dealer in a place.
The goods are made of ash, and well finished.
We have two factories. one in the East and one in the West, and are able to take better care of your trade than if we had but one.
For catalogue and discount address:

Illinois Refrigerator Co ,
909 Masonic Temple,
Chicago.
If West of Chicago.

Columbia Refrigerator Co.,
Northville,
Wayne Co., Mich.
If East of Chicago.



FROM DEALERS LOOKING FOR THE

Best Refrigerator Made

We solicit an opportunity of presenting the merits of our

"Wisconsin Peerless."

Mineral Wool Filling. Absolutely cleansable. More and better talking points than all other makes combined. Absolute guarantee. Seventh season.

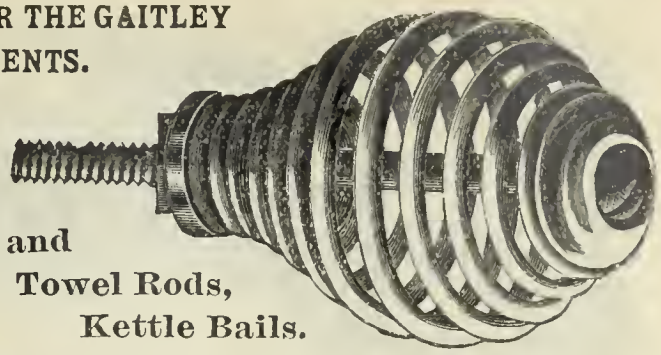
For Catalogue address

The Wisconsin Refrigerator Co.

EAU CLAIRE, WIS.
New England Office,
175 Hanover Street, BOSTON, MASS.



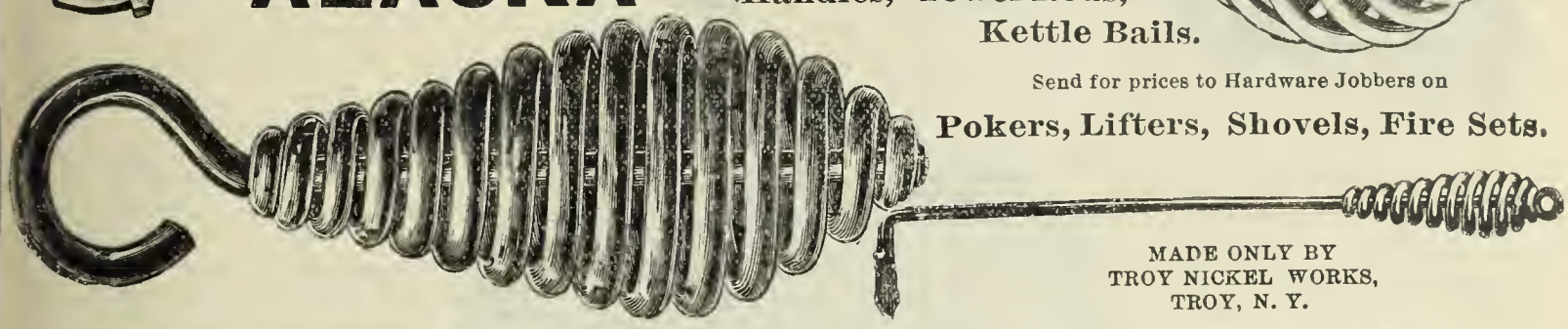
MADE UNDER THE GAITLEY PATENTS.



ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.

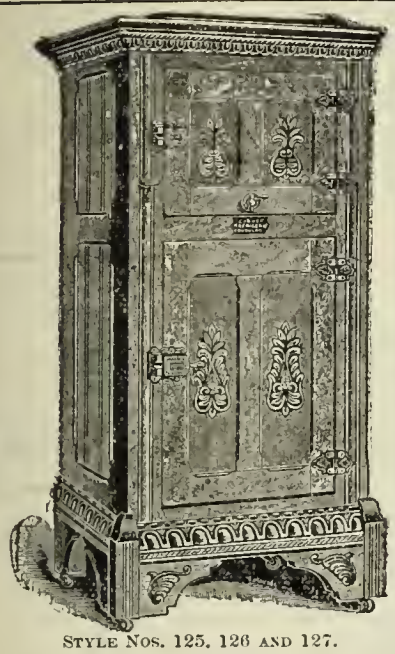
Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.



MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

"The Only Cleanable Refrigerator."



"Removable Galvanized Ice Compartment."

STYLE NOS. 125, 126 AND 127.

Gurney Patent REFRIGERATORS.

WE CLAIM FOR THE "GURNEY:"

"REMOVABLE GALVANIZED ICE COMPARTMENT."
"THE ONLY CLEANABLE REFRIGERATOR."
"CAN BE KEPT ABSOLUTELY PURE AND CLEAN FOR ALL TIME."
"THE LOWEST AVERAGE TEMPERATURE."
"THE GREATEST ECONOMY OF ICE."
"DRY AIR FREE CIRCULATION"
"PACKED WITH MINERAL WOOL (the best non-conductor.)"
"THE GREATEST SELLER."

The "Gurney" Proves what we Claim.

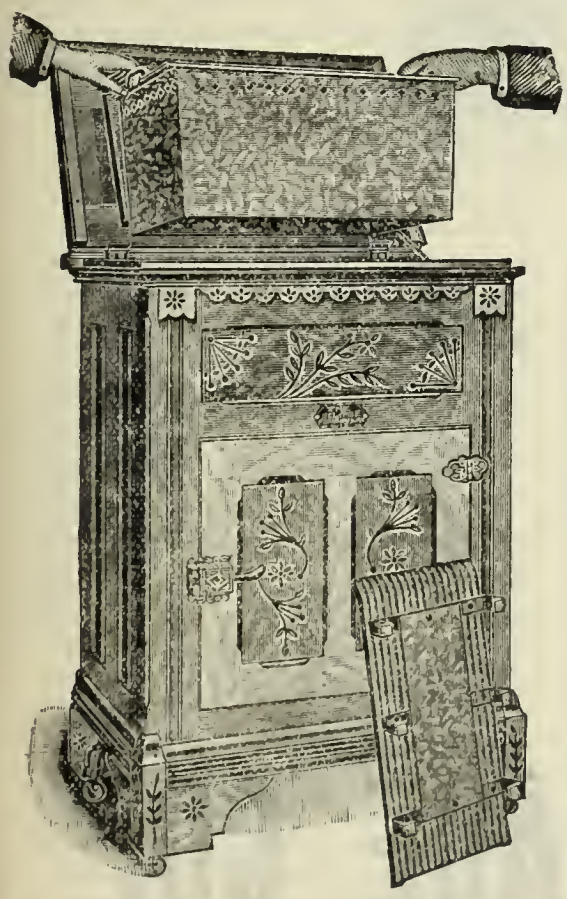
The following Jobbers will handle the Gurney for the Season of 1895:

The S. M. Howes Company, Boston, Mass.
A. W. Martin, Baltimore, Md.
Supplee Hardware Co., Philadelphia, Pa.
Bindley Hardware Co., Pittsburgh, Pa.
Frank Diel, Syracuse, N. Y.
McIntosh-Huntington Co., Cleveland, O.
Indianapolis Stove Co., Indianapolis, Ind.
Chicago Stove & Range Co., Chicago.
Freeman Delamater & Co., Detroit, Mich.
Robert Seeger, St. Paul, Minn.
A. J. Lindemann & Hoverson Co., Milwaukee, Wis.
King Hardware Co., Atlanta, Ga.
O. K. Stove & Range Co., Louisville, Ky.
Heckel Hardware Co., St. Louis, Mo.
Howard W. Peak, Fort Worth, Texas.
Richards & Conover Hardware Co., Kansas City, Mo.
Tolerton & Stetson Co., Sioux City, Iowa,
Rector & Wilhelmy Co., Omaha, Neb.

LLEWELLYN BONHAM, our New York representative,
Room 52 Pierce Building, N. W. corner Hudson and Franklin Streets.

We want a jobber in every distributing point in the United States, and a dealer in every town and city. Write for catalogue, terms and discounts, and secure the agency.

Gurney Refrigerator Co., Fond du Lac, Wis.



THE ECLIPSE HARDWOOD REFRIGERATORS.

Patented Separable and Removable Ice Compartment.

Can be kept perfectly clean with the least trouble.

It will pay you to write for Catalogue and secure the agency.

—THE—

Bowen Manufacturing Co.,

FOND DU LAC, WIS.,

SOLE MFRS.

MICA NORTH CAROLINA WYOMING, AMBER.

EUGENE MUNSELL & CO.,

218 Water Street, NEW YORK.

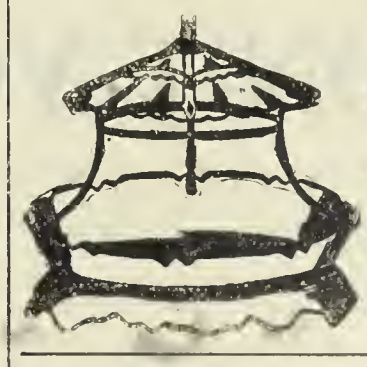
NEW HAMPSHIRE

MICA

IS THE BEST.

The F. E. BELDEN MICA MINING CO.,

12 Broad St., Boston, Mass.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Propr.,
89 Fulton St., N. Y.

— KITTIE: "I heard to-day that you married your husband to reform him."

Sarah: "I did."

Kittie: "Why, I didn't know he had any bad habits."

Sarah: "He had one—he was a bachelor."—*Exchange.*

— "WHAT do you think of bloomers?" asked the flirtatious woman.

"Er—I believe I prefer the buds," said the young man in answer, and it was not long before he found himself alone.—*Indianapolis Journal.*

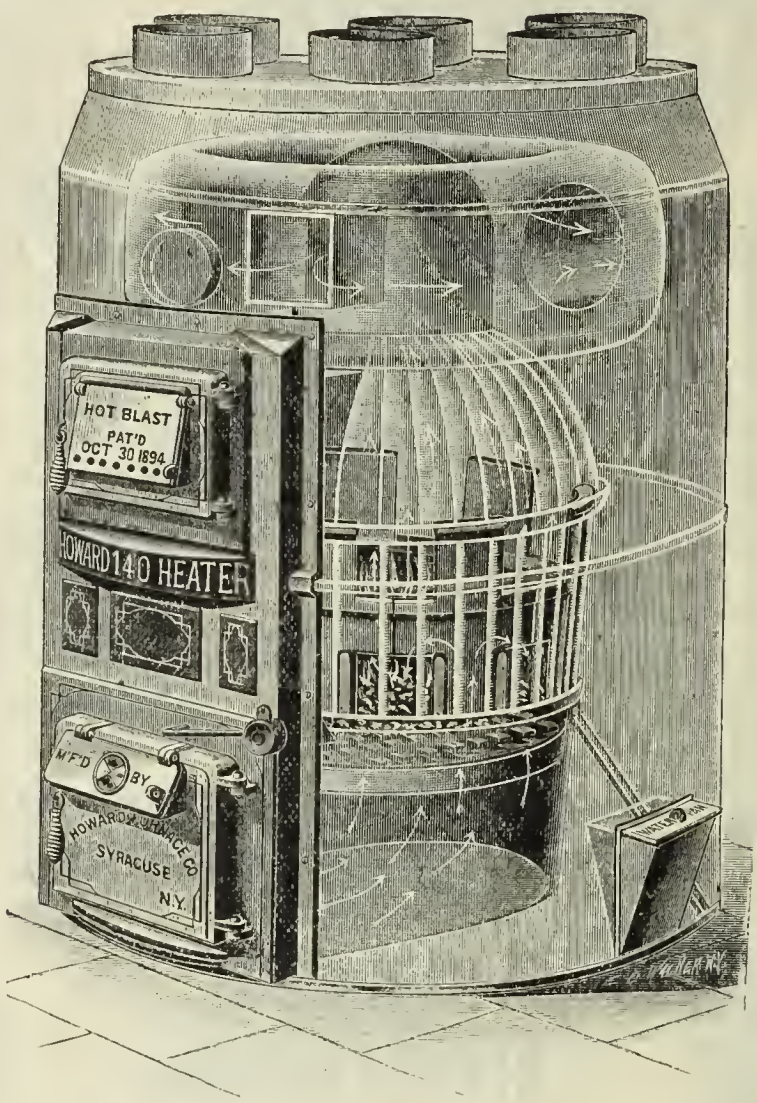
—"WHY, Johnny, how did the baby get that frightful bruise?"

"Oh, me' n' him's jes had a scrimmage fer his red'n' blue football."

And the next minute Johnny was tackled low.—*N. Y. Recorder.*

HOWARD FURNACES

Made to BURN **Soft Coal.**



Made to BURN **Soft Coal.**

DON'T YOU SEE

THINK THAT ANY ARTICLE HAVING MERIT IS WORTHY OF SOME NOTICE? WHY NOT THEN SEND FOR OUR CATALOGUE AND MAKE APPLICATION FOR AGENCY?

THE SIMPLICITY OF CONSTRUCTION. THE MANNER IN WHICH THE BLAST IS ARRANGED AND THE EASE OF ADJUSTMENT.

HOWARD FURNACE CO.

Main Office and Works,

Syracuse, N. Y.

NEW YORK, BOSTON, GRAND RAPIDS, TORONTO.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 19, 1895.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 3.
Index to Reading Matter.....Page 57.

Accuracy.

Above all other elements in a workman's ability stands accuracy, without which all his work may go for naught. And yet, to many men quantity seems to stand before quality, at least to the extent that *almost* right is good enough. It is seldom that accuracy and extreme celerity go hand in hand. As a rule the accurate man, he upon whom one can always rely, is relatively slow. Nevertheless, when one compares his output of work which is always accurate with the net useful result of a lightning workman the balance is likely to tip in favor of the slow but sure method of doing things. Surroundings have certainly much to do with a man's ability to habitually turn out accurate work. In some establishments the incessant nagging and rushing, by unnecessary interference so upsets a workman that he is continually blundering. But there are other shops where, notwithstanding the fact that there is always a steady pressure to get work out, a man nevertheless feels that it must be right at all hazards.

Haste and Waste.

When the head of an establishment fully absorbs the idea that haste inevitably makes waste it will be seen that there is a way to get work out on time, to have it correct and to keep the workman in the best frame of mind to give his constant and undivided attention to his work. Accuracy on the part of the individual can certainly be cultivated, but nevertheless some men seem to be naturally far better equipped in this way than others. Acquired accuracy is a virtue, so to speak, of slow growth. It must, in fact, become a habit to be accurate, and, like all other habits, it must therefore be the result of repeated action. As each new job comes to the workman his determination must be that this particular job shall be just a little better, a little nearer perfect, than the last. He must see to it that no move is made until he knows that it will bring the desired result, that no piece is cut until it has been measured and that it is not laid aside until its thorough completion is rendered evident by careful inspection.

A Pompeian Bathroom.

A very interesting discovery recently made near the old site of Pompeii is described in the European journals. A large building was unearthed on the property of a Signor de Prosco, containing several rooms, among them three bathrooms, furnished with large sculptured marble basins, heating apparatus, lead plumbing work, with bronze faucets, and tiled floors and walls. The three rooms correspond in their arrangements w ith the usual hot, tepid and cold baths usually found in the old dwellings of the wealthy classes. This is, however, said to be the most complete, richest and best bathing installation so far found. It has been so well preserved on account of the roof not having caved in during the great eruption of Vesuvius, which buried the city of Pompeii in the year 79. Most of the houses were entirely destroyed at that time, only a few vaulted structures resisting the immense pressure of the lava and ashes. This roof is nearly 45 feet in length.

Another Gasoline Field.

The intense heat that can be secured from gasoline has made it useful in specially constructed fire pots for plumbers. As the early apparatus has grown in popularity a large number of new devices, all of similar character, have come into the field. With the gasoline furnace no heavy fire pot and large bag of charcoal must be carried by the plumber's helper, and no bin for fuel storage is required at the shop. In operation there is no shower of sparks to burn the carpet or curtains in a dwelling, or to start a fire among the refuse in a new building. No time is lost in starting a fire, and no disagreeable smoke made. With the furnace filled at the shop and tightly closed no leakage can occur to make trouble. Some of these furnaces are so made that they can be used as a torch to melt off old fittings or to get up a heat, and without them a plumber would in many cases be at a loss for some convenient means of doing his work. It is safe to say that the cost of plumbing has been reduced by their introduction. In some of the large cities, however, this indispensable helper of the suburban plumber is not used, either through adherence to past custom and blindness to its excellence, or owing to the prejudices of the insurance companies. Their entrance to this field will come, as their convenience is too great to be ignored, and the fact that they are used exclusively in both old and new work throughout the country is a sufficient guarantee against the supposed danger.

News and Notes.

Contracts are reported to have been signed for the elevation of the New York Central Railroad tracks in Buffalo, at a cost of $3,000,000.

Referring to the threat of Germany to shut out American provisions, Phil. Armour quoted the export statistics the other day on the cattle and beef trade, which show that nearly all the American cattle and dressed beef go to England. What goes to the European Continent is, in comparison, a drop in the bucket. Mr. Armour expressed himself as undisturbed by any apprehension on account of German embargoes.

The annual report of the harbor master of the port of Montreal, Can., for 1894 shows that the tonnage of the seagoing vessels which arrived there during the year was 1,096,909 tons—a decrease of 54,868 tons as compared with 1893; and the tonnage of the inland vessels was 979,809 tons—a decrease of 73,791 tons. There was also a decrease of 12,977,909 bushels in the exportation of grain.

The United States Consul at the Straits Settlements calls attention to the fact that Russian petroleum is supplanting the American product in that region. He says the Russian facilities for handling it are superior.

Nova Scotia's coal output in 1894 was 2,055,114 tons, an increase of 86,500 tons over 1893. Exports to the United States exceeded 120,000, an increase of 100,000 tons as compared with the previous year, due to the lowering of the tariff.

The Wyoming Petroleum Company have been incorporated at Cheyenne, Wyo., with a capital of $1,000,000, for the purpose of acquiring and developing oil lands in that State.

The Harland & Wolff Shipbuilding Company, of Belfast, Ireland, are reported to be in negotiation with a Liverpool company for the construction of two Atlantic liners, each to be 1000 feet long.

It is understood that the decision of the trustees of the Boston Franklin legacy to apply the same to the purposes of a trade school, pure and simple, will be adhered to. The trustees are said to be at present negotiating for the purchase of a suitable site for the school and considering plans for the buildings.

THE LETTER BOX.

Squaring the Circle.

From READER, *New York City.*—Please describe through the Letter Box of *The Metal Worker* the method of squaring the circle.

Answer.—A good many hard questions are asked of *The Metal Worker* and we try to answer them to the best of our ability. This, however, so far as we remember, is the first actually unanswerable question that has ever been propounded. To square the circle is to do what the mathematicians have been striving to accomplish for at least 20 centuries, and for how much longer we do not know. Squaring the circle, as technically understood, is finding the exact area of a circle. We can find it approximately, and so near in fact that the error is an infinitesimal quantity; but this is not mathematical accuracy. The difficulty heretofore encountered is that the relation between the diameter and circumference of a circle is an indeterminable quantity. The area of a circle is exactly equal to one-quarter the product of the circumference and the diameter. But the trouble is we cannot determine the length of the circumference from the diameter with absolute accuracy. The relationship is usually expressed by 3.1416, but that decimal can be extended without ever coming out even; in fact it has been worked out to over 100 decimal places. We trust our correspondent will, therefore excuse us for not answering his question. If any reader of *The Metal Worker* thinks he has solved this vexatious problem we shall be glad to hear from him.

Pattern for Fluted Cone.

From J. M. R., *Reading, Pa.*—Please inform me through *The Metal Worker* how to obtain a pattern for an article of which I send you a sketch. The idea is to start with a given diameter at the bottom and to die away to nothing at the top. Each piece to be cut to shape and raised.

Note.—The sketch given in our correspondent's letter shows a tapering helix in the form of a fluted cone. The work depends entirely upon raising the metal and the pattern cutting problem is not diffiult. The fluted pieces which are twisted in the form of a helix and are tapered at the same time are merely long strips of metal of triangular shape—that is, they start from a point at the top of the helix, and are of the width of the base of the flutes at the other end. If we have misunderstood our correspondent's inquiry we shall be glad to give it further attention.

Weight of Air.

From H. T. G.—Please inform me what is the weight of a cubic foot of dry air at 5°, 10°, 15°, 20°, 25°, 30°, 35° and 40° below zero?

Answer.—As a result of experiments made by Biot and Arago, it was determined that 100 cubic inches of dry air, with the barometer at 30 inches, and the thermometer at 60° F., weigh 31.074 grains. Then 1 cubic inch of air would weigh 0.31074 grain. As there are 1728 cubic inches in a cubic foot, $0.31074 \times 1728 = 536.958+$, or nearly 537 grains of dry air in 1 cubic foot, according to the above conditions. Thus 1 cubic foot of air under ordinary circumstances weighs about 1¼ ounces. As a rise of temperature of 1° F. causes air to expand one-four hundred and eightieth of its bulk, 1 cubic foot of air would be one-four hundred and eightieth part lighter for each degree of rise in temperature. Accordingly we can consider that 1 cubic foot of air would be one-four hundred and eightieth heavier for each degree the temperature was lowered, being under the same conditions. By dividing 536.958 grains, the weight of 1 cubic foot of air, by 480, the quotient, 1.118+ grains, is the increase in weight for each degree the temperature is lowered. As we wish first to obtain the weight at zero, we multiply 1.118 by 60, and add the result, 67.08, to the weight 536.958; the sum of the two is 604.038 grains. As 1.118 grains is the increase in weight for each degree the temperature is lowered, $1.118 \times 5 = 5\ 59$, the additional weight for each 5°. As a matter of convenience we may consider the weight of 1 cubic foot of air at zero to be 604.04 grains, and that 5.6 grains are to be added for each 5° the temperature is lowered. According to the above calculations the weight of 1 cubic foot of air at the temperatures given would be as follows:

604.04 grains at zero.
609 64 grains at 5° below zero.
615.24 grains at 10° below zero.
620 84 grains at 15° below zero.
626.44 grains at 20° below zero.
632.04 grains at 25° below zero.
637.64 grains at 30° below zero.
643.24 grains at 35° below zero.
648.84 grains at 40° below zero.

As the above are supposed to be Troy grains, and as there are 7000 Troy grains in 1 pound avoirdupois, $7000 \div 16 = 437.5$ grains per ounce avoirdupois. Then at 40° below zero the weight of a cubic foot of air, under the conditions above named, would be 648.84 divided by 437.5 grains, or 1.483 ounces.

Condensation Under Iron Roof.

From J. D. S., *Fredericton, N. B.*—As I have always been benefited by the information contained in the Letter Box, I now ask *The Metal Worker* to assist me in my present difficulty. Last fall we put a galvanized iron roof on a building 40 x 100 feet, having a pitch of about ¼ inch to the foot. The roof was laid with tongued and grooved boards, and covered with tarred paper before we put on the galvanized iron, which was No. 26, and put on over a wooden roll, the seam being on top. The cross seams were well grooved and soldered. We did not have any trouble from leaks during the heavy fall rains, nor until cold weather set in, when we had a spell of soft weather. There was about ½ inch of snow on the roof when it began to drip in several places. The building is of brick, four stories high, and the upper stories are used for storage and are not finished. Would the building, being just finished and consequently not thoroughly dry, cause the dampness? We have laid several roofs like the above mentioned and have had no trouble from them, but the buildings are all finished inside, being lathed and plastered under the roofs. What is best to do to stop the "leaks," which to my mind are caused by condensation?

Answer.—As there was no drip or leak from the roof during heavy rains, it would indicate that the seams did not leak. Such being the case, it would appear that our correspondent was right in supposing the drip was caused by condensation. However, as it is possible that the subsequent cold weather may have caused the roof iron to contract sufficiently to crack the seams, it might be well to give the roof a thorough inspection. When a building is provided with a metallic roof which is so arranged as not to prevent moisture from coming in contact with its under surface, and when the weather is sufficiently cold, the moisture evaporating from the building coming in contact with the surface of the roof covering is sometimes condensed in such quantities as to run along the roof boards until an opening is found, and drips upon the floor below. The obvious method of stopping this condensation is to prevent the moist air from coming in contact with the roof. This might be accomplished by covering the underside of the joist with building paper or lath and plaster. If this cannot be done, it might be well to place ventilators in the roof so the evaporation from the building can be carried off. This latter plan has often been followed with success. We would be glad to have suggestions from our readers.

Flux for Soldering Zinc.

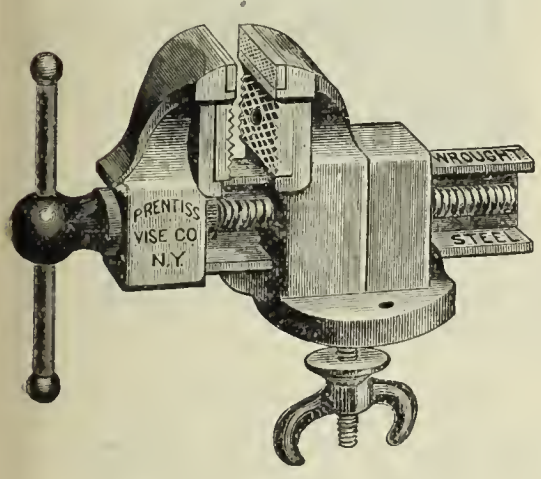
From J. S. Z., *Richmond, Ind.*—Is there any other flux besides acid diluted with zinc which can be used successfully for soldering zinc, thus doing away with the discoloration of work after it is finished? If any of your readers know of a substitute which will not have this effect on finished zinc work I will be pleased to have them tell me what it is through the Letter Box.

Wanted, Show Window Suggestions.

From W. S. L., *New York.*—I am a young tinner who is looking for something to work at during the long winter evenings. I have already made a couple of models which have been used successfully for window display, and I am now looking for some other notion to work on. I would be very glad if the readers of *The Metal Worker* could help me with suggestions in this line.

Prentiss Improved Pipe Vise.

Prentiss Vise Company, 44 Barclay street, New York, have brought out an improved combination pipe vise, as



Combination Pipe Vise.

here illustrated. The main feature is the sliding bar, made of wrought steel, which is a decided gain in tensile strength compared with the cast iron part which is superseded by it. This detail, it is claimed, adds much to the life of the vise. The steel plate pipe jaws or grip plates used with this vise are, it is stated, made of the best steel, carefully tempered. They are deeply serrated at right angles, forming innumerable points. The plates are reversible and interchangeable and full width of the vise, thus giving greater holding contact, with, it is pointed out, much less pressure on the pipe than with the old style concave jaws.

In a recent communication to the Mining Society of Nova Scotia, C. E. Willis states that the district near the eastern coast of Port-au-Port Bay, Newfoundland, is seamed in many places with asbestos. He says that the metamorphous rocks and serpentines of Quebec dip under the Gulf of St. Lawrence to reappear on the western coast of Newfoundland, and extend probably across the island. Only surface work has been done so far, but the asbestos fiber is claimed to be of good quality, up to 2½ inches long, and practically identical with the well-known Canadian product.

The Odorless Steel Sanitary Dump Cart.

The cuts shown herewith represent a steel dump cart, offered by the United States Sanitary Company, 618 Pennsylvania avenue, Washington, D. C. The cart is described as having a body made of the best flange steel, thoroughly riveted, and provided with a built up axle, which enables that portion of the axle that passes through the body to be incased in a steel boiler tube, expanded at the ends, and as having all joints air and water tight. There are two lids or doors, one at the back and one at the front, for greater convenience in loading, these being made with deep flanges, to close as tightly as possible. It is explained that the lid at the rear is operated by a spring handle on the side of the body, which works easily, the lid being locked in any of three positions—shut, half open for loading, or open all the way for dumping. The distance from the ground to the top of the tank or body, when the tank is level, is 4 feet 4 inches, and, if desired, for easy loading the body can be adjusted at an angle which will bring it 2 feet lower. The lids covering almost the entire top makes it possible to load the cart at either end, thus filling the body full. It is stated that the dumping gear is so arranged that when the cart is fully loaded it can be dumped completely by a boy; and that when it is desired to clean the cart after emptying, by opening the lids and adjusting the body to the desired angle it is possible to reach and thoroughly wash the interior in every part. In construction either the Archibald iron hub, the plain wood hub, the Warner or Sarven wheel is used, as may be desired. It is stated that the axles are entirely of steel, and are all to standard size; that the castings are of gray iron, steel and malleable iron, and that the axle nuts, boxes, arms, spindles and drops are interchangeable, so that they may be renewed at small expense and with little labor. It is remarked that the carts are painted in attractive colors, lettered if desired, and that they are varnished with good, heavy coach varnish, presenting an attractive appearance because of their superior finish. The point is made, that by using a high wheel and having the body low on an even balance, one horse can readily handle the large cart when loaded with garbage to its full capacity. Two sizes of carts are made, the only practical difference being in the size of the body.

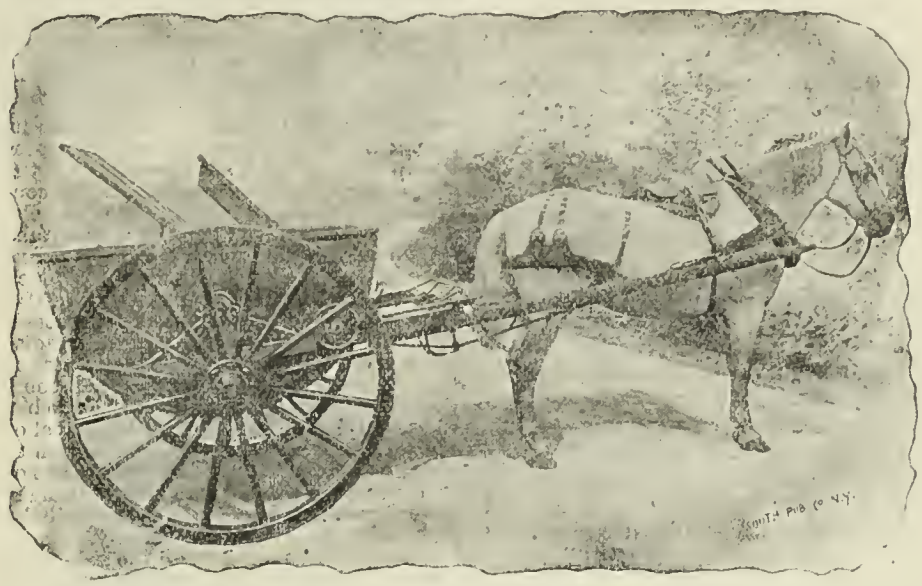


Fig. 1.—The Odorless Steel Sanitary Dump Cart.



Fig. 2.—Cart in Dumping Position.

The large cart has a capacity of 54 cubic feet and weighs, empty, about 1500 pounds. The small one has a capacity of 37 cubic feet and weighs, empty, 1300 pounds. The company remark that their aim is to produce, at a reasonable price, a vehicle of the highest grade, that will do its work in the easiest and most efficient manner. The carts are designed for handling garbage, night soil, material from sewer inlets, street sweepings, lime, mixed mortar, &c. The company advise us that they will be pleased to correspond with cities, towns, corporations or firms desiring to put the carts in service, and that they will gladly quote prices or give any desired information.

PLUMBING and GAS FITTING.

Newark, N. J., Plumbers.

The first annual concert and ball of the Master Plumbers' Association of Newark, N. J., was held in the Krueger Auditorium on January 15. The Auditorium has a fine dancing floor, a handsome stage, where the Voss orchestra discoursed a select musical programme, and along each side are balconies with the space below inclosed by a railing for spectators. The Committee of Arrangements—Wm. Jacob, F. J. Sturn and Jacob Rau—had a pretty propramme of the dances distributed during the grand march, which was led by Nathan Steiner and Miss Schaeffer.

The gathering wss notable for the number of handsomely costumed ladies who gave grace and beauty to the occasion and were quite the feature of it.

H. V. Ammermann, W. Zeliff and Charles Geissle were the Floor Committee, and the dances were liberally patronized. The Reception Committee were Elias Berla, Charles E. Bond, E. J. Leonard, Jos. A. Smith, C. Sullivan, Walter P. Dunn, Franklin B. Sandford, James C. McGuire, R. J. O'Crowley, Francis Lang, Chas. B. Zimmerman and Ira Budd. Among the guests were State Vice-President John Hickman, Levi McBride, J. T. McNabb and Jas. Kearney of Paterson, L. J. Parks, Geo. W. Plastow, National Executive Clerk W. E. Crosby, Alexander Don, C. P. Vanderveer, G. F. Hickmot, J. Conover, R. Doremus, Wilbur Doremus, T. H. Hoover and a host of other friends of the members with their ladies. During the evening an intermission was called when all marched to the banquet hall, where an elaborate *menu* was served in excellent style. At the close of the banquet President Berla made some happy remarks, among which was the statement that plumbers were better men on account of having better halves, and added that the evening of the entertainment was honored in being the anniversary of the birth of Mrs. Wm. Jacobi, to whom he had the pleasure of presenting a basket of beautiful flowers in behalf of the association. On leaving the banquet hall dancing again became the pleasure of the hour until the gathering dispersed with happy recollections and kindly wishes for the Newark plumbers.

Master Plumbers and Knights of Tabasco.

We have received the following letter from James F. Davlin, president of the Somerville Association of Master Plumbers, on the action of the National Executive Committee *vs.* Knights of Tabasco:

I write to express my approval of the article in your recent issue from our honored national president, John Mitchell, wherein he very politely, yet forcibly, advises the Knights of Tabasco to refrain from attending the national conventions of the master plumbers in the future:

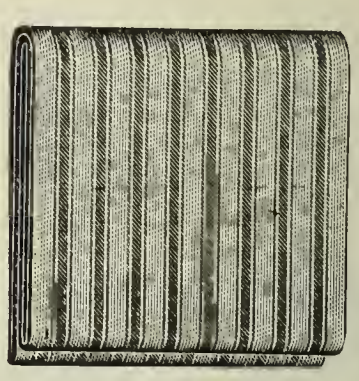
I admire the gentlemanly manner in which President Mitchell voices the sentiments of the National Executive Committee and many members of the last convention in Detroit, myself among the number, and while I do not care to add anything to what Mr. Mitchell has written, I believe it would be much better if the delegates to the national gatherings were left wholly to the local society with such provisions as are usually made by the national body while attending the convention for such pleasures as may be practicable after the labors of the convention are ended, but while the convention is in session I hold that the delegates who attend to their duty and take such interest in the proceedings as is necessary for an intelligent discharge of such duty, will be benefited far more by a restful evening between sessions and better fitted, physically and mentally, to consider, discuss and dispose of the many questions of great interest to the craft which will come before them for action. My experience has taught me that from the time the gavel of the presiding officer calls the convention to order until it falls to announce the close of the proceedings, every moment is fraught with interest and responsibility to the delegates, individually and collectively. Therefore, I say that it requires all the mentality of all the delegates in all its strength and vigor to properly perform their duties. While I recognize the good intentions and genial motives of those generally good fellows—the Knights of Tabasco—I agree fully with President Mitchell and the members of the Executive Committee in the advice given to the knights *anent* our national conventions, and I hope to hear from every quarter of the country where master plumbers are organized a hearty approval of the wisdom of our national officers. I am not going to say one word about the (in my opinion) hasty and injudicious communication of the "Old Pepper," other than to remark that he has got himself in a pickle.

Modern Plumbing Regulations

The old plumbing regulations of New York City do not cover the advance made in plumbing practice and material, and in the Department of Buildings this is recognized. Superintendent Thomas J. Brady has had prepared new regulations for lighting, ventilation and plumbing, and they are now under consideration. This step has been necessary to meet the rapid progress that has been made in these trades. Wrought iron or steel pipe has come largely into use in the recent past, and in some cases lighter pipe than is desirable has been employed. The different weights and grades have been investigated and only a heavy pipe of the best quality will be recommended by the department. Brass pipe also is more largely used in plumbing work than heretofore, and pipe of the caliber known as iron pipe sizes is the only kind that will come up to the standard of the department. It is known that some of the brass thimbles, solder nipples, &c., formerly used, have been of very low grade metal and very light, so that it was difficult to tin them and wipe a proper joint, and in calking a joint with one of these ferrules, to make a soil pipe connection, they frequently caved in or assumed an irregular form, making a tight and perfect union almost impossible. The investigations of material have been exhaustive, and in consideration of the best interests of all from a sanitary standpoint the recommendations are for a high standard. The same character of investigations and recommendations have been made in reference to lighting and ventilation. These steps are in the right direction, and the matter is now receiving consideration as to its final disposition.

Columbia Wiping Cloth.

The illustration of the wiping cloth presented herewith shows a cloth that is being sold by the J. W. Chamberlain Company, Bangor, Me. The cloth, the makers advise us, is made under the personal supervision of a plumber of more than 30 years' experience, and its particular features of merit are alluded to. The cloths are made of special



Columbia Wiping Cloth.

ticking and have, we understand, been used with the most satisfactory results by plumbers.

Wisconsin Plumbers.

Last week 75 plumbers from all parts of the State met at the St. Charles Hotel, Milwaukee, Wis., and formed the Master Plumbers' Association of Wisconsin. L. H. Plum, president of the Milwaukee Master Plumbers' Association, opened the meeting and made an address of welcome. State Vice-President W. H. Halsey of the National Association of Master Plumbers received the new organization into membership. Forty-eight firms from the State at large were represented. They were as follows: Joseph Callahan, Green Bay; George Kraft, Madison; Anton Metz, Madison; O. K. Patterson, Stevens Point; J. P. Wray, West Superior; Louis Sontag, Sheboygan; William Hardeker, P. J. Dullanty, Ashland; H. L. Larsen, Manitowic; R. C. German, Janesville; Behrens & Reeke, Sheboygan; Charles Heeskelar, Eau Claire; William Lekland, Sheboygan; W. Goddard, Oshkosh; Murphy & Fredel, Fond du Lac; O A. Jones, Oshkosh; G. L. Krause, William Brechtel, Sheboygan; Thomas F. Delany, John F. Lee, Wausau; Thomas & Anheiser, Nelson Skog, Green Bay; Anton Breheme, Fort Howard; A. B. Taylor, Fond du Lac; John Wahler, Duncan McTavish, Harry Morris, H. Raymond, Coffee & Williams, Racine; J. P. Fox, Eau Claire; David Ahron & Son, Fond du Lac; Stack Bros., Burnett & Son, West Superior; C. S. Gregory, Beloit; W. S. Patterson, Appleton; A. F. Shoenoff, Menomonee; Neil & Co., West Superior; A. V. Fetter, La Crosse; P. H. Ryan, Appelton;

George B. McCall, Chippewa Falls; Charles Hewlett, Racine; James A. Trane, William Wenzel, Appelton; J. H. Case & Co, Green Bay; Jackson & Longthorn, Kenosha.

After appointing committees on Constitution and By-laws and Resolutions the following officers were elected:

President, P. H. Ryan, Appleton.

Vice-president, George B. McCall, Chippewa Falls.

Secretary, W. S. Patterson, Appleton.

Treasurer, Charles Hewlett, Racine.

Sergeant-at-arms, John D. Jackson, Rhinelander.

The following committees were appointed:

Constitution and By-laws: J. P. Fox, C. S. Gregory, John F. Ahearn.

Resolutions: Louis Sontag, William Hardecker, O. K. Patterson.

The association will favor a bill at the coming session to appoint boards to license plumbers and supervise the business of plumbing. The bill creates a board of examiners in every town of 5000 inhabitants, consisting of the chairman of the Board of Health, the building inspector and a third member who shall be a master plumber, who shall be appointed by the mayor and be allowed $5 per day for actual service. These boards shall license applicants who are deemed competent, at the rate of $2 for master plumbers and 50 cents for journeymen plumbers. The bill also provides for an inspector of plumbing in every city of 5000 inhabitants. The bill provides that the common councils of cities of 5000 shall pass rules for materials, construction, alterations and inspection of pipes, faucets, tanks, valves and fixtures, which shall be binding on all builders, under penalty of $50. It was decided to hold the next annual meeting in Racine January 9 and 10, 1896. George B. McCall of Chippewa Falls, J. P. Fox of Eau Claire and President Plum were selected as delegates to the National Association of Plumbers in Philadelphia, June 5 and 6, 1895. Before adjournment the convention passed a vote of thanks to the Milwaukee local association for courtesies received.

The Milwaukee Association entertained the delegates with a theater party and a banquet.

Scranton Plumbers Organize.

A meeting was held by the master plumbers of Scranton, Pa., in the rooms of the Builders' Exchange last week, for the purpose of forming an association. This movement was brought about by James F. Traynor, president of the Master Plumbers' Association of Wilmington, Del., who was appointed by National President John Mitchell for the work of organizing new associations.

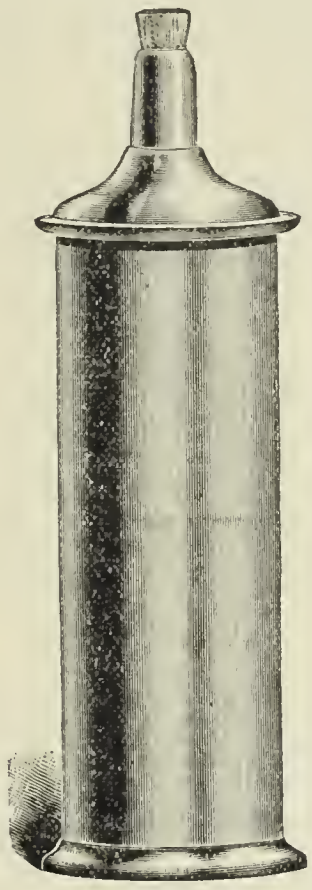
William Stephens, a prominent member of the Wilkes-Barre Association, was also present. There was a large attendance of the local plumbers, and they were all enthusiastically in favor of organizing and every man who had not a pressing business engagement attended the meeting. The officers elected are:

President, H. J. Gunster.
Vice-president, Thomas Mullen.
Secretary, John J. Gorman.
Treasurer, John J. Howley.

L. H. Tillinghast & Co., Providence, R. I., dealers in plumbers' supplies, have been incorporated as the L. H. Tillinghast Supply Company.

Handy Pocket Torch.

Kendrick Valve & Washer Company, Syracuse, N. Y., manufacturers of pump valves, plungers and specialties for plumbers' steam fitters' and tinsmiths' use, are offering a handy and useful torch for this class of mechanics. It is designed to supersede the candle, giving a much better and safer light, with none of the candle's untidy characteristics. It is 4 inches long and 1⅛ inches in diameter. The tube is filled with cotton to be saturated with gasoline or oil, and a wick placed in the tube, which is covered with a cap. The bottom is fitted with a screw cap which



Pocket Torch, Full Size Cut.

can be readily removed for filling. The torch is polished and nickeled. When not in use the burner is covered with an extinguisher or cap.

Benefits from Organization.

Many of our readers will be interested in the following letter from John Mitchell, president of the National Association of Master Plumbers:

A short time ago I received from an association organized but a few months previous to the last national convention an inquiry as to the benefits derivable from membership in an association. So much has been written on the subject by able writers, who have had the interest of the association at heart and whose official positions enabled them to write intelligently on the subject, that the query appeared to me extraordinary. I can but voice the sentiments heretofore expressed. A "Philadelphia plumber" has offered some timely advice on the proper selection of local officers. Ex-President Hannan has written on "The Benefit of the National Association," while an energetic secretary of a new thriving association located outside of our domain—J. W. Hughes of Montreal—has declared that "even the very plumbers have a soul to be saved." However, it may not be out of place at this season of the year, when associations are starting in on a new year of either success or failure, for me to give the lukewarm associations a few hints as to what beneficial results may be secured by a properly conducted master plumbers' association.

Judging from the tone of some of the letters received at this office, there is an apparent lack of interest manifested by both members and officers of some local associations. To continue on without overcoming this feeling of unconcern in self-preservation, or associated existence with inimical relations between members, is, I must frankly admit, a useless expenditure of time and money. An association can be a success only so far as each member contributes his influence in making it so.

FORTUNATE ASSOCIATIONS.

There may be communities of plumbers so fortunate as to have no need of associated harmonious action. They may be so friendly, one with the other, that they speak as they pass; will impart to a fellow craftsman a bit of information—"I hear you are going to do some work for Mr. Neverpay. Well, 'old fellow' you are most welcome to his trade. I refused to do any more until he paid up. I hope he will not cheat you," and will refuse to do work for a party when a member has not been paid. If this kind of fellowship prevails in your city you have reached the acme of perfection. Manufacturers may be selling only to the trade in your city. If so, pause for a moment and consider what influence wrought the change, for did it exist before the formation of the National Association? If you feel that you have secured all these benefits from your association and affiliation and that you can no longer afford to support the grand national organization, silently offer thanks to those who have spent time and money in the elevation and protection of our craft. Do not be so ungrateful as to now question the association's influence for good. You can render to your less fortunate fellow members an invaluable service by lending your influence to the cause and imparting to them the secrets of your success.

LUKEWARM ASSOCIATIONS.

If on the other hand there are associations that feel there is a chance for improvement, which I mistrust exists, I respectively dedicate to them these words with the sincere hope that they may incite them to renewed and well directed efforts.

"LIVE AND LET LIVE."

In these days of sharp competition considerable rivalry among master plumbers prevails in localities, and it is to be deplored that it sometimes reaches enmity; operating to the detriment of all, and especially disastrous during general financial depression, when instead of pursuing the policy of "the dog in the manger," making nothing yourself nor allowing your neighbor the chance, you should have done as has been done in some associations—"live and let live." Or reversing the phraseology of the terse maxim: Allow others to live and they will do likewise.

I have found the feeling of antagonism so great in localities that actually one plumber would go on the other side of the street rather than meet his neighbor in the same line of business. And for what reason? In the majority of cases simply because he has met you in what should be honorable competition—figured on a job too low, secured it, and then has done what you would have done from necessity: slighted the work and substituted material where possible. Then what have you done? Taken means to have the owner informed that your competitor has done so and so. What is the result of all this? The owner or builder, to say the least, makes it disagreeable. He may refuse to pay. Your competitor is compelled to sue and jeopardize the motive actuating him at first; that is, if he could once do the work, he would in the future have the preference from that owner. It is most pleasing to note that there are many master plumbers above this kind of rivalry. They can be picked out, as they have always work at living prices. The supply houses know them, for they can promptly pay their indebtedness. But there are many who might be likened unto the dog in the manger who could not eat hay, but nevertheless jumped into the manger, biting and starving the horse.

A GOOD FOUNDATION.

Before you can expect to inaugurate reform you must first have a good foundation on which to build. It is as truly essential that the underlying principles, the stability and unity of the association, should be strong, as it is that the foundation of the building should be solidly constructed; otherwise, it is like a "house built upon the sand," the first wave of dissension causes destruction. Before attempting to carry out measures for the aggrandizement of members sheathe the knife you

have carried up your sleeve so long and be ready to greet your fellow member cordially, show him by your action that you trust him and he will soon learn to trust you. Have a good word for him and he will remember you kindly.

While dictating this paragraph a business man came into my shop, exclaiming : "My wash bowl has given out." Without giving me a chance to inquire the cause he anxiously volunteered the information, which he supposed would make me happy —"The plumber who put it in was a fraud." The countersunk piece in the bottom of the bowl, connecting with the plug and coupling, had pulled out. I said : "It is not the fault of the plumber, but an unforeseen flaw in the bowl." He looked astonished that I disagreed with him; but do you think he would have had more confidence in me had I agreed with him in denouncing a neighbor's work?

Let it be written in your constitution that you will do unto others as you would wish others to do unto you. I fancy my readers smiling at the Scriptural injunction as impossible, and each saying, "I would do it, but the other fellow would not." That is the trouble—distrust. There is an association that has made this injunction rather obligatory by means of a fine for a violation of the principle. Means are adopted to collect the fine. One way is expulsion, which means forfeiture of offender's share in the treasury, containing several thousand dollars.

THE WAY TO BE BENEFITED.

It very frequently happens that bills are brought in for criticism, the recipient expecting that he will be assured of the exorbitancy of the bill and receive a hint that had he patronized the "only practical" plumber he would not have been thus annoyed. I call to miud a large association that has adopted a schedule of prices to obviate this practice, and which has given satisfaction. If the bill is brought in for denunciation the plumber looks it over, and if in accordance with the schedule says, "It is the same as I would have charged." Try it and you will never have some customer say you have robbed him, and as a result lose his trade.

Agree to finish no work for an owner on which a member has been employed and for which he has not been fully paid. Sometimes a settlement cannot be secured by reason of alleged inferior workmanship or a non-compliance with an architect's whim. It may be owing to a failure of the owner or builder. The failure of a plumber to get his pay means his inability to pay the supply man. The supply men realize this and will assist you. Try this, and you will find that each member has a great financial advantage over non-members.

Agree to sell no goods you do not put in, and then members of the craft will never have a customer say, "I have some goods which I waut you to put in." An instance came to my notice a short time ago where a city plumber sold some material to a suburban resident, who went to his local plumber to have the work done. The local plumber was a member of the National Association, and supposed he had a clear case against a dealer, but found that some brother plumber had wrouged him. Adopt this rule and you will have less complaints to make.

Agree to put in no material that you do not furnish, for you can't afford to guarantee goods that you do not buy. A strict compliance with this rule will teach owners who have plumbing to do that it is to their advantage, with regard to sanitation and cost, to deal with the plumber exclusively.

Did you ever contract to do a job, and a little later be informed by your journeymen that they must have an increase in wages, which you could not afford to give, as you had figured on a certain rate? Too much importance cannot be laid upon the beneficial results of harmony betwecn employer and employee. Conference committees I have always found to be most satisfactory. In some cases unwarranted ruptures have occurred ; conference committees have been discharged and conflicts have followed, where, had the pleasant conference relations existed, disputes might have been amicably adjusted without recourse to strikes. I hope for the time when all associations will have a regular conference committee to meet with the journeymen, and theu all master plumbers will know in advance what wages they are to pay.

Can you reckon the monetary value to be derived from each one sincerely following out the above suggestions, each one of which has been successfully pursued in several sections?

AFFILIATION WITH THE NATIONAL.

But little explanation is needed with regard to affiliation with the National Association, The Baltimore resolutions are known from the Atlantic to the Pacific. There are many complaints of alleged violations, but the records of this office show that 90 per cent. of the complainants have been unable to substantiate their charges. Cases have occurred where it was apparent that the manufacturer had sold to the consumer. Little indignation meetings have been held, and committees appointed that have found that the supposed faithless manufacturer held an autograph order from a master plumber to deliver goods to a consumer; thus signing away his rights to the detriment of himself and associates. It is this class of plumbers who are the loudest in their denunciations.

One member came into my shop a few days ago denouncing the Baltimore resolutions, and come to find out he had never read them over, and, therefore, did not live up to them.

CAN YOU ATTEND TO LOCAL COMPLAINTS?

There are many petty complaints which local associations can adjust with more rapidity than the National, because of distance and meager information. Many associations are able to adjust complaints today, but if they stood alone and did not have the representative master plumbers throughout the country to espouse their cause and act in case of failure, could they succeed?

It is not a strange occurrence to get no more information in a communication than the following: "Mr. Smith of this city has received a shipment of goods from Mr. Dealer. Attend to it promptly." If you write for further information you may not receive a reply, or if you are so fortunate you are liable to be accused of asking for useless information in order to indefinitely postpone action, or you may be accused of presuming to doubt the correctness of his statement.

THE NATIONAL READY.

The National Associatiou is ready at all times to assist locals in the amicable adjustment of all violations of the protective regulations. It is not the fault of the national officers that some associations do not receive what they call "the worth of their money."

The lukewarm association might be likened unto a patient, and the National a physician. If the physician prescribes medicine and treatment for the recovery of the patient and the patient has no faith in the advice and medicine, partly carries out the instructions, or, as sometimes happens, does not carry them out at all and does not use the medicine because it is a little inconvenient, and does not recover, or what is more likely grows worse, who is to blame, the patient or the physician?

TRAPS AND VENTS.

John Murray and F. H. Close have formed a partnership in the plumbing line under the name of Murray & Close, at Jackson, Mich. Mr. Murray is well-known in that city, having been a plumber there for 40 years. Mr. Close has been connected with the Michigan Heating & Plumbing Company since their inception.

Fred. W. Gore, who has been with the Chippewa Falls Plumbing & Supply Company and their predecessors for six years, is opening a plumbing shop of his own at 108 West Central street, Chippewa Falls, Wis.

From one who has had experience comes the statement that when seamless drawn brass tubing is used where there are great changes of temperature, it should be ordered slightly annealed. Tubing that has been drawn by several processes under heavy pressure has at times shown a tendency to become brittle in places; then owing to the unequal expansion and contraction in the hard and soft places under a change of temperature, it has been known to split or crack. To prevent such a contingency a slight annealing has been found all that is necessary. Piping for hot water service is likely to have a change of 100° in a short time quite frequently; but it is said if the pipe is properly annealed no disagreeable results may be expected.

The Executive Board of the Master Plumbers of Connecticut met in the Hotel Russwin, at New Britain, Conn., last week. The business of the year was balanced and preparations were made for the annual convention to be held in Waterbury, February 6. Those present were John Ahearn of Hartford, J. B. Weiant and J. S. Stone of New Britain, S. E. Dibble of New Haven, C. S. Eames of Bridgeport, John Stevens of Hartford and Messrs. Disley and Barrow of Waterbury.

A new plumbing firm have been organized in Lafayette, Ind., to be known as Seagraves, Cochran & Co., who have absorbed the business of Sheehan & Co., and are established at 134 East Main street. The firm are composed of D. C. Seagraves, who has been with Wallace Bros., and W. F. Cochran, who has been with the O. P. Benjamin Company, and W. L. Sheehan, the senior of the late firm of Sheehan & Co.

The H. Mueller Mfg. Company, Decatur, Ill., issue an eight-page circular of Mueller's patent stop and waste cock, showing the many different convenient forms in which it is made. It also shows the Mueller patent basin clamp, which suits any thickness of basin, and, it is said, cannot slip.

The Board of City Record of New York has ordered the issue of 400,000 circulars to householders, giving sanitary instructions. The circulars will be distributed by the police as soon as they can be printed.

The master plumbers of Waterbury, Conn., held a meeting last week in the Board of Trade rooms and began their arrangements for the annual convention of the master plumbers of the State, which will be held in that city, in the City Hall, on February 6. The convention will be the fifth annual and the address of welcome will be made by Mayor E. G. Kilduff. The following committees were appointed: Reception, W. E. Disley, M. J. Daly and Patrick Garrity; Music, W. E. Booth and Edward Casey; Finance, Edward Casey and William Minor; Printing, Robert Walker. After the convention, the delegates will be banqueted at the Scovill House.

Some discussion is going on at Toledo, Ohio, over the water works trustees selecting two water meters from which to make a choice, instead of letting a consumer select any meter he prefers.

John Brady has opened a plumbing shop on Gold street, Bridgeport, Conn.

C. F. DeVennish, City Inspector of Plumbing and Drainage, at Columbus, Ohio, has submitted his annual report to Health Officer D. N. Kinsman, by whom it has been approved. The inspector bears very strongly upon the necessity of issuing plumbing licenses to master plumbers and journeymen who are competent in every respect to do the work and requiring them to pass rigid examinations in the rules and regulations as established by law. Thousands of dollars are expended in beautifying buildings, while the sanitary appliances do not receive the consideration they deserve. Following is part of the work to which the report refers: Inspection

new plumbing work in new and old buildings, first and second inspections, 273; new work not accepted until plumbing rules were complied with, 37; changes ordered in sewerage and drainage, 48; owners notified of work not approved, 15; defective plumbing ordered remodeled, 18; defective plumbing repaired on complaint, 93; buildings, public and private, inspected, 218.

A MASTER PLUMBERS' ASSOCIATION has been organized at Allentown, Pa., and the following officers have been elected: President, J. H. Birchall; vice-president, J. C. Bitterling; secretary, August Leibold. This association will be affiliated with the National Association of Master Plumbers.

THE CODY PLUMBING COMPANY succeed the Cody-Hineline Company at Minneapolis, Minn.

HUGHES & BROOKS succeed John F. Hughes in the plumbing business at Little Rock, Ark.

FIRE, on January 12, destroyed the plumbing shop of Rogoski & Dungan, Little Rock, Ark.

THE MASTER PLUMBERS of New Hampshire met in Manchester recently and discussed the feasibility of advocating a State law controlling plumbing.

SAMUEL MCFARLAND has been engaged by Peck Bros. & Co., New Haven, Conn., to visit the architects and plumbers in New York in the interest of their line of sanitary specialties. They have a fine showroom at 16 East Twenty-third street, New York, under the management of C. M. Coleman.

MAYOR HENDRICK of New Haven, Conn., has appointed Dr. Joseph F. Townsend and Samuel E. Dibble to serve for three years on the Board of Health. These appointments are highly commended by the *Evening Leader* of that city. Mr. Dibble is well known to the plumbing trade throughout the country and his appointment will be gratifying to them. It is a matter of regret that there are not more master plumbers of Mr. Dibble's kind appointed on health boards throughout the country.

THE CHICAGO MASTER PLUMBERS' ASSOCIATION will hold their annual reception and ball on the 30th inst., at the Auditorium, having secured the banquet hall for that purpose. The arrangement committee consists of Paul Redieske, Thomas Conway, P. Sanders, Alexander W. Murray, G. A. Larson, T. P. Culloton, P. M. Murphy, C. C. Breyer and J. B. Breen. The annual ball is always an important event with the Chicago plumbers, being much more of a social occasion than balls usually are. This will undoubtedly be a most enjoyable gathering.

THE BROADWAY PLUMBING COMPANY have been incorporated in St. Louis with an all paid capital stock of $1000.

THE CLEVELAND MASTER PLUMBERS' ASSOCIATION held their regular bi weekly meeting last week in the Builders' Exchange, Cleveland, Ohio. After a discussion of trade matters the following officers were elected: D. H. Roberts, president; Eb. Allen, vice-president; S. W. Burrows, treasurer, and L. Bonesteel, secretary.

THE MASTER PLUMBERS' ASSOCIATION of St. Louis have elected officers for the current year as follows: President, John Mahon; first vice-president, W. H. Kuhns; second vice-president, William Schwehr; recording secretary, William F. McCormack; financial secretary, John P. Kelleher; treasurer, E. J. Lonergan; sergeant-at-arms, A. J. Gallagher.

THE IOWA STATE PLUMBERS' ASSOCIATION will hold its annual meeting in Burlington, beginning January 22 and continuing until the evening of the 24th. The local committee of arrangements consists of Henry Ewinger, Geo. Stewart and C. G. Bosch.

Connecticut's Proposed Plumbing Law.

Through the courtesy of the secretary of the Connecticut State Association of Master Plumbers, John S. Craig, 59 Farrington avenue, Hartford, Conn, we have received a copy of the proposed plumbing law that has been introduced in the Legislature. A committee has been appointed by the association to give such information and assistance as are necessary to aid in securing its enactment. The text of the proposed law is as follows:

AN ACT RELATIVE TO THE LICENSING OF PLUMBERS AND THE SUPERVISION OF THE BUSINESS OF PLUMBING.

Be It Enacted by the Senate and House of Representatives in General Assembly Convened.

SECTION 1.

No person, firm or corporation shall engage in or work at the business of plumbing, either as a master or employing plumber or as a journeyman plumber, unless such person, firm or corporation has received a license therefor in accordance with the provisions of this act.

The word "plumber," as used in this act, shall be deemed to mean a person who has learned the business of plumbing by working for at least three years either as an apprentice or under an agreement for instruction, and who has then worked for at least one year as a journeyman plumber. The word "journeyman," as used in this act, shall be deemed to mean one who personally does any work in plumbing, the mode of doing which is subject to inspection under any ordinance, by-law or rule passed under the authority of this act.

SECTION 2.

That within thirty days after the Examining Board, hereinafter provided for, shall have organized, every person engaged in, or working at the business of plumbing in this State, prior to the 1st day of June, 1895, and desiring to engage in or work at said business, in any city or town where licenses for plumbing are required, shall register his name and address at the office of the Board of Examiners, to whom applications for licenses are to be made, in such city or town, and state under oath when and how long he has been engaged in or has worked at said business, and whether as master or employing plumber or as journeyman plumber.

Said Board of Examiners, if satisfied that the person so registering was actually engaged in or working at said business prior to said date, shall so certify to the Boards of Health of their respective cities or towns. The Board of Health shall thereupon issue to him a license setting forth that he was eugaged in or working at the business, either as a master, or employing plumber or journeyman plumber, as the case may be, prior to the 1st day of June, 1895, and authorizing him to engage in or work at said business, either as a master, or employing plumber, or as a journeyman plumber.

In the case of a firm or corporatiou, the examination and licensing of any oue member of the firm or the manager of the corporation shall satisfy the requirements of this act.

SECTION 3.

There shall be in every city, and in every town of five thousand inhabitants or more, and in every town having a system of water supply or sewerage, a Board of Examiners of Plumbers, who shall serve without compensatiou, appointed by the Board of Health of said city or town, consisting of not less than three nor more than five members, one of whom shall be a member of the Board of Health, as said Board may designate; also of not less than one nor more than two master plumbers, and of not less than one nor more than two journeyman plumbers. All the members of said Board of Examiners shall be citizens and residents of the cities or towns in which they are appointed.

SECTION 4.

Said Board of Examiners shall, as soon as may be, after their appointment, meet and organize by the selection of a chairman, and shall designate the times and places for the examination of all applicants desiring to engage in or work at the business of plumbing, within their respective jurisdictions.

Said Board shall examine said applicants as to their practical knowledge of plumbing, house drainage and plumbing ventilation, and shall submit the applicant to some satisfactory form of practical test, and if satisfied of the competency of the applicant, shall so certify to the Board of Health in their respective cities or towns. The Board of Health shall thereupon issue a license to such applicant, authorizing him to engage in or work at the business of plumbing, either as a master or employing plumber, or as a journeyman plumber.

The fee for a license for a master or employing plumber shall be two dollars; for a journeymau plumber it shall be fifty cents.

Said license shall be valid and have force throughout the State, and shall be renewed annually upon payment of a fee of fifty cents

In case of removal beyond the jurisdiction of the Board of Examiners issuing the original license, it may be renewed by any Board having like authority.

SECTION 5.

The Board of Health of each city or town mentioned in section 3 of this act shall within three months from the passage of this act appoint one or more inspectors of plumbing, who shall be practical plumbers of at least five years' experience, either as a master or as a journeyman, during the years next preceding the date of appointment, and who shall hold office until removed by said Board of Health for cause, which must be shown. All such inspectors shall before appointment be subject to examination by the Examining Board.

The compensation for such inspectors shall be determined by the Board of Health appointing them, and shall be paid from the treasury of their respective cities or towns.

Said inspectors shall inspect all plumbing work for which permits are hereafter granted within their respective jurisdictions in process of construction, alteration or repair, and shall report to said Board of Health all violations of any law, ordinance, by-law, rule or regulation relating to plumbing work, and also perform such other appropriate duties as may be required.

The approval of any plumbing by any other inspectors thau those provided for under this act shall not be deemed a compliance with the provisions thereof.

SECTION 6.

No Inspector of Plumbing in any city or town shall inspect or approve any plumbing work done by himself, or any persou by whom he is employed, or who is employed by or with him; but in each city or town subject to the provisions of this act, the Board of Health shall appoint an additional Inspector of Plumbing, in the same manner, and subject to the same qualifications as the regular Inspector of Plumbing, whose duty it shall be to inspect, in the manner prescribed in this act, plumbing work done by the regular Inspector, or any persou by whom he is employed, or who is employed by or with him.

Said additional Inspector shall have authority to act in case of the absence or inability of the regular Inspector, and receive for his services such compensatiou as the regular Inspector would for a like duty. The provisions of this sectiou shall not apply to auy city or towu which has heretofore established, or may hereafter establish, an annual salary for the position of Inspector of Plumbiug, and in any such city or towu no Inspector of Plumbing shall engage in or work at the busiuess of plumbing.

SECTION 7.

In each city or town of 5,000 inhabitants or more in this State, aud every town hav-

ing a system of water supply or sewerage, shall by ordinance, or hy-law, within six months from the passage of this act, prescribe rules and regulations for the materials, construction, alteration, and inspection of all pipes, tanks, faucets, valves, and other fixtures, by and through which water or sewerage is used and carried; and provide that no such pipes, tanks, faucets, valves, or other fixtures shall be placed in any building in such city or town, except in accordance with plans which shall be approved hy the Board of Health of such city or town. Said Board of Health have control of the enforcement of the regulations regarding plumhing; and shall further provide that no plumhing work shall he done, except in the case of repairs of leaks, without a permit being first issued therefor upon such terms and conditions as such cities or towns shall prescribe. But nothing in this section shall prevent Boards of Health from making such rules and regulations in regard to plumhing and house drainage hitherto authorized hy law, which are not inconsistent with any ordinance or by-law made under the authority of this section by the respective cities or towns within which such Boards of Health have jurisdiction.

SECTION 8.

Any person violating any provision of this act, or any ordinance, hy-law, rule, or regulation made thereunder, shall be deemed guilty of misdemeanor, and be subject to a fine not exceeding fifty dollars for each and every violation thereof. and his license may be revoked by the Board of Health.

Any city or town mentioned in section 3 of this act refusing to comply with any of the provisions of this act shall forfeit the sum of fifty dollars, to the use of the State for every month during which such neglect may continue.

SECTION 9.

The provisions of this act shall apply to all persons who are now, or may be hereafter, learning the business of plumbing when they are sent out to do the work of a journeyman plumber.

Any person now holding an appointment as inspector of plumbing who shall be eligihle to appointment under the provisions of this act, or who at the time of appointment had learned and had worked at the business of plumbing five years as a journeyman, shall be deemed to have heen appointed under this act.

SECTION 10.

The said Board of Examiners shall annually, before the 1st day of June, make a full report in detail to their respective Boards of Health of their cities or towns of all their proceedings during the year under this act.

All acts and parts of acts inconsistent herewith are hereby repealed.

Secretary Murray's Report.

Following is the report of Alex. W. Murray, the retiring secretary, read before the Chicago Master Plumbers' Association on the 14th inst.:

The association is to be congratulated upon its prosperous condition, having a good balance to its credit, a lihrary containing many valuable hooks treating upon sanitary suhjects, and a complete list of catalogues of the merchandise used by the trade, which is heing constantly added to. This is an important feature in the many accommodations of the rooms you have so generously furnished for the comfort of the members.

It had been the constant thought of your officers what would he the best manner of creating an interest in the meetings. The president in his admirable report has suggested some addition. I would recommend that at least 75 minutes of each meeting should be devoted to discussions upon mechanical prohlems pertaining to the trade. Another suggestion is that you have a quarterly meeting to which members of the craft whom you would consider as desirable members be invited. At such meetings it might he well to have a supper, so as to partake more of the sociable feature than of the plumbing business. Another suggestion is that the Executive Committee make a list of those who are not members, and make an official call upon them. In my many years of experience in association life, I have found many to say, "Why have I not been invived to join the association?" It is my belief that the returns would pay for the extra expense.

In conclusion, let me say that I may have heen particular in calling attention to those who were not prompt in reporting the work of the association, hut I simply did my duty as I viewed it. I thank the members and officers for their kind forbearance and universal courtesy extended to me during my 26 months' incumhency of the office, and wish the association a prosperous year.

Master Plumbers and Knights of Tabasco.

Ex-President Jeremiah Sheehan has prepared for publication a letter from which we quote as follows:

In a recent issue of the trade press I noticed an article from the pen of President Mitchell on behalf of the Executive Committee of the National Association of Master Plumbers, deprecating the future attendance at conventions of a certain class of drummers for manufacturers of plumbing material, now better known as the Knights of Tabasco; also, a reply to same from "Old Pepper" Thomas F. Cushing.

Mr. Mitchell's Motives.

In my opinion Mr. Mitchell's suggestions are very pertinent. Those who attended the excursion to St. Clair Springs on the last day of the Detroit convention can testify that the conduct of some of the hilarious knights was a disgrace. I do not claim that they were all knights; it is to be regretted there were a few hilarious plumbers.

The evident intention of the article was to discourage the tendency recently manifest—Hurrah for the convention and a good time, even at the sacrifice of decency. It is a plea for more orderly conventions and gives information to manufacturers as to their so-called duty.

To Whom Addressed.

It is not directed to the body as a whole, but to the few who have given displeasure to the many. It is directed only to those who merit the reproof. If there is any one who feels that the shoe fits, let him wear it.

There are many very genial, gentlemanly and worthy representatives of manufacturers whose attendance at the conventions is an honor to the association and a credit to their employers. These gentlemen have, by their influence, speaking a good word here and there, added much to the strength and efficiency of the National Association, and I hope will so continue to do. I do not think any one of this class feels that Mr. Mitchell's remarks are in any way directed to or affect them.

To me it appears to be directed more particularly to manufacturers, explaining that it was not expected of them that they should send their agents to the conventions, as has been represented by some agents. The manufacturers seemed to be of this opinion, judging from the action of the Central Supply Association, convened at Cleveland, passing a resolution discountenancing such future action. . . .

Contributions from manufacturers and jobbers for the entertainment of delegates should be discouraged and condemned. We are a large prosperous organization and able to bear our own expenses, and if not let us stay at home until we are. The national treasury has of recent years voluntarily offered quite a sum to local associations where conventions have been held, to help defray expenses. If it is necessary let us double the amount and be independent, as one body of business men should be of another.

THE MASTER PLUMBERS of Scranton, Pa., organized a local association last week and elected the following officers: President, H. J. Gunster; vice-president, Thomas Mullen; secretary, John J. Gorman; treasurer, John J. Howley. James F. Traynor, president of the Master Plumbers' Association of Wilmington, Del., was largely instrumental in getting up the association. He and William Stephens were present at the organization meeting and explained fully the objects of the associations throughout the country.

J. F. JENNINGS & Co, plumbers, are now located at 312 West Main street, Kalamazoo, Mich.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

LEVI MCBRIDE, Patterson, N. J., is doing the plumbing and heating in the residences of J. Weiss and A. Hopper. He also has the contract for the plumbing, tinning and copper work for the Eastwood silk mill.

THE COMMISSIONERS of Douglas County, Minn., have awarded the contract for heating, ventilating and plumbing the new Court House to H. Kelly & Co., Minneapolis, Minn.

THE CONTRACT for the metal work and plumbing on the cold storage house of A. C. Hunt & Co., Springfield, Mass., has been let to E. C. Atwater & Co. of that city.

THE NEW CITY HALL at Lansing, Mich., will be heated on the blower system, and bids for the heating will be asked.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until February 14 for the work including roof covering, drainage, &c., for the United States Post Office, Court House and Custom House Building at New Berne, N. C. Drawings and specifications may be had from the Supervising Architect at Washington or from the Superintendent at New Berne.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until February 6 for the low pressure return circulation steam heating and ventilating apparatus for the United States Custom House and Post Office Building at St. Albans, Vt. Drawings and specifications may be had from the Supervising Architect at Washington, or from the Superintendent at St. Albans.

KEHN BROS. & MERTZ, 289 East Kinzie street, Chicago, have the contract for steam heating in the store and flat building of Henry Ricke, Centre and Larrabee streets.

M. J. CORBOY, 78 Dearborn street, Chicago, is to do the plumbing, gas fitting and sewerage in the store and office building of J. B. Legnard, River and Dock streets.

GEO. L. ROOD, 79 Lake street, Chicago, is to install a Royal hot water heater in the residence of Walter McDonald, Calumet avenue, near Fortieth street.

P. NACEY & Co, 339 Wabash avenue, Chicago, are completing the plumbing, gas fitting and sewerage in the residence of Gen. C. W. Drew, Calumet avenue and Forty-third street.

STEAM AND HOT WATER.

Programme of the American Society of Heating and Ventilating Engineers.

The following is the programme of the first annual meeting of the American Society of Heating and Ventilating Engineers, to be held at 12 West Thirty-first street, New York, commencing Tuesday, January 22, at ten o'clock a.m.:

PROGRAMME.

Meeting to be called to order at 10 o'clock, Tuesday, January 22, 1895, at the hall of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City.

Order of Business.

1. Roll Call.
2. Reading of Minutes of Previous Meeting.
3. President's Address.
4. Report of Secretary.
5. Report of Treasurer.
6. Report of Chairman of the Board of Managers.
7. Report of Chairman of the Council.
8. Appointment of Nominating Committee.
9. Report of Special Committees.
10. Reading of Papers.

Papers.

a. "Determining the Heating Power of Heating Systems," by Prof. J. H. Kinealy.—Discussion.
b. "Heating and Ventilation of School Buildings," by T. J. Waters.—Discussion.
c. "Testing of Steam Radiators," by Prof. R. C. Carpenter.—Discussion.
d. "A Short Talk on Hot Water Radiators," by J. J. Wilson.—Discussion.
e. "A Prison Heating and Ventilating Plant," by H. B. Prather.—Discussion.
f. "The Literature of Heating and Ventilating," by H. J. Barron.—Discussion.

11. Election of Officers.
12. New Business.
13. Topical Discussion.

Topics for Discussion.

[These questions are allowable for discussion at any point in the programme believed desirable.]

1. In designing a system of heating and ventilation, shall we heat by radiation, and supply only tempered air for ventilation, or shall we heat by the air supplied for ventilation?
2. In a plenum system of heating and ventilation, which is the better for the air ducts, "off and on" hot and tempered air dampers, or "mixer" dampers?
3. The average amount of water condensed per 100 square feet heating surface per hour, in the different manners in which heating coils and radiators are erected.
4. The necessary size of risers for a given amount of heating surface, for the different sizes of pipes and coils, and for different classes and sizes of radiators.
5. The necessary size of horizontal mains for a given amount of heating surface, for the different size of pipes and coils, and for the different classes and sizes of radiators.
6. The probable future of electrical heating.
7. Necessity of automatic air and water valves on steam systems.
8. Where a propulsion fan is used for heating and ventilating a theater, is an exhaust or aspirating fan necessary?
9. What should we accept as the minimum standard of ventilation for various buildings, and what is the best means to employ to obtain this result?
10. Current systems of air delivery in simple indirect and fan system plants *vs.* plenum chamber system.
11. The consulting engineer and a common specification *vs.* "free for all" competition for contracts for heating and ventilating plants.
12. Value of standing committees of the society on test standards.
13. What is the proper proportion for cold air inlets to hot air furnaces?
14. Efficiency of extended surface in steam and water radiators.
15. The merits, if any, of vertical over horizontal circulation in hot water heaters.
16. Joints in sectional steam and hot water heaters, considering them as we find them in ordinary construction, such as gasket joints, screw joints, and push nipple joints.
17. The advantage possessed by metal over wooden cold air conduit.
18. Wrought iron pipe compared with steel pipe.
19. Compensation for plans and specifications.
20. Are mushroom registers under auditorium seats advisable or are all floor entrances for warm air objectionable?
21. In designing a hot water system shall we assume a cooling in the radiators of 15, 20, 25 or 30 degrees?

The council may change this programme as they think desirable during the progress of the evening.

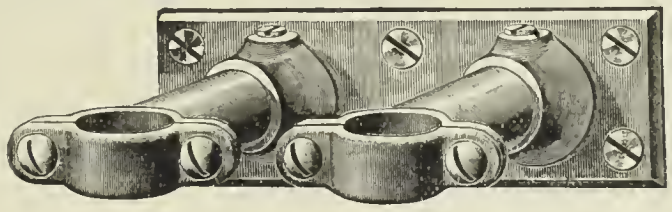
Meetings will probably be held during the morning and afternoon of each day, and it is expected that the convention will last about three days. During the interim between sessions members will be invited to inspect the heating and ventilation of some of the more important plants in and around New York.

The location of the hall at which the meetings will be held is in the center of the hotel district.

This meeting promises to be a very important one, and it is hoped that the attendance will be large.

The Columbia Pipe Hanger.

We show in the accompanying illustration one form of the Columbia pipe hanger made by the J. W. Chamberlain Company, Bangor, Maine. The hanger is made single, double, triple and quadruple, and in all sizes, from ⅜ to 1½ inches, and finished as plain, galvanized, polished brass or nickel plated. The particular merit claimed for this form of hanger is that it does away with clamping the pipes close to the walls or ceilings, permitting the pipes to be hung from 1 to 4 inches from the wall, and can furthermore be taken down or adjusted to grade after the pipes are in place. It is pointed out that with the Columbia hanger pipes can be put up with a correct grade, regardless of the unevenness of ceilings.



Columbia Pipe Hanger.

The Heating of Greenhouses by Gas.

The following paper by William R. Chester was read before the Manchester District Institution of Gas Engineers in England:

Probably many of the members of this institution will, at some time or other, have had their attention turned to the possibility of heating small or moderate sized greenhouses with coal gas, and some of them will probably have carried out schemes for accomplishing this purpose. The great difficulty, however, in the way of a more extended application of the system is the cost of gas as fuel, which if burned continuously at even a small rate per hour throughout the day and night soon runs up the cost to considerable figures. In spite of this drawback, however, I am inclined to think that, when all things are properly taken into consideration, it will bear a favorable comparison with any other system of heating; and if an automatic arrangement be applied to the gas supply, to increase or diminish the consumption in exact accordance with atmospheric variations of temperature, it will be found that gas is both cheaper and better adapted than any other form of fuel for greenhouse purposes—at any rate, in all those cases where a moderate temperature only of (say) 50° to 60° is required.

If we take a moderate sized conservatory of the lean-to type, 20 feet long, 12 feet wide, and 10 feet high at the top, sloping to 6 feet at the eaves, we shall

have a superficial area of glass amounting to about 440 square feet. Each square foot of glass surface is capable of cooling 1¼ cubic feet per minute of heated air in the interior of the conservatory to the temperature of the atmosphere outside; so that with a glass surface of 440 feet superficial, 550 cubic feet of air will be lowered to atmospheric temperature per minute. In order to maintain a constant temperature in the conservatory it will, therefore, be necessary to provide so much heat per minute as will raise the temperature of 550 cubic feet of air the number of degrees which is the difference between the interior and exterior temperatures of the air—say, about 30° F. The normal interior winter temperature required is about 50° F.; the exterior temperature seldom going lower than 20° F., or 12° of frost. Of course, the atmospheric temperature often gets lower than 12° of frost; but not in sheltered places, such as those in which conservatories are usually built.

Now 550 cubic feet of air represents about 45 pounds in weight; and the specific heat of air being 0.2375 as compared with water, we shall require to develop as much heat as will raise the temperature of 10.6 pounds of water 30° F. per minute, which is 318 B.T.U., or 19,080 units of heat per hour.

In a specially constructed boiler made to utilize, say, 80 per cent. of the total heat developed from the combustion of coal gas, we should be able to do this work with a consumption of 30 cubic feet of gas per hour, or 720 feet per day, which would cost, at 2 shillings 6 pence (62 cents) per 1000 cubic feet, (say) 1 shilling 9½ pence (44 cents). This consumption is based on the rather extreme supposition that the low temperature of 12° of frost would continue throughout the 24 hours; but as this is a rare occurrence, we may take it that the comparison is as unfavorable to gas as it is possible to make it. If during the daylight the atmospheric temperature should rise, the automatic regulator would come into operation and at once reduce the consumption of gas and proportionately diminish the cost. It would not, therefore, be unfair to take the cost of gas at 1 shilling 6 pence (37 cents) per day as an average. On the other hand, if a conservatory of similar size were heated by coal or coke burnt in an ordinary saddle boiler, such as is customarily used for the purpose, it would require from 1½ to 2 hundredweight per 24 hours, which, at (say) 8 pence (16 cents) per hundredweight delivered, would cost from 1 shilling to 1 shilling 4 pence (25 to 33 cents) per day. Add to this the wages of an attendant to fire up and clear away the ashes (say) two hours per day, at 5 pence (10 cents) per hour, the cost would be 1 shilling 10 pence to 2 shillings 2 pence (45 to 54 cents) per day. If the greenhouse be heated by hot air flues instead of by water pipes, the consumption of coal or coke would be still greater.

Extremes of temperature are always detrimental; and where solid fuel is used it is next to impossible to maintain that regularity in small greenhouses which is so essential. On this point alone the use of gas for heating purposes possesses an immense advantage. With solid fuel firing, the furnace is filled up at periods of the day or night, and as it burns through there is an excess of heat developed, which raises the temperature of the house too high. Then as the fire burns down, it is allowed to fall too low, and unfortunately sometimes, at critical periods, the fire has a way of burning out from want of attention, and thus producing perfectly disastrous results. With the gaseous fired boiler specially constructed for the purpose, this variation can never occur, and it may be depended on to maintain the temperature required with perfect regularity.

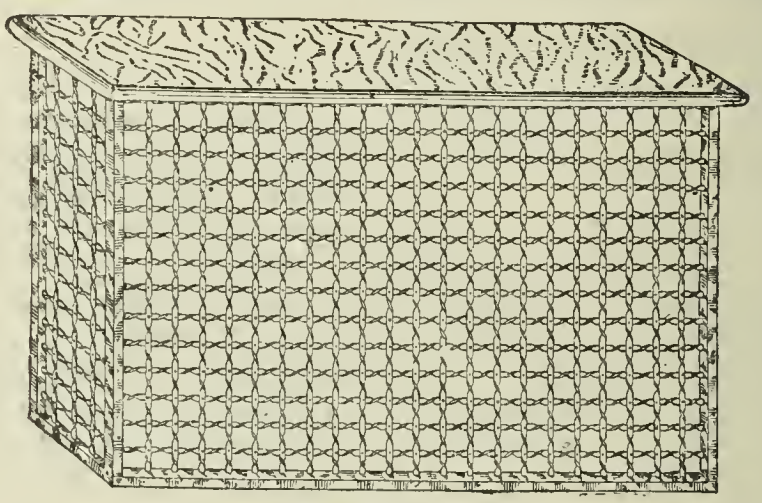
This specially constructed boiler, capable of maintaining the above high ideals, has yet to be made; for though I have experimented with many types, as at present manufactured, there are none which yet come up to the mark, and some of them fell very far short of it. The boiler must be constructed with a studded bottom and interior tubes with gills or studs on the inside for rapidly absorbing the heat and transmitting it to the water. It must be of such length as to absorb all the heat developed by the combustion of the gas except just the amount necessary to insure a continuous upward current; and it must be boxed in round the burner so as to admit no more air than is just sufficient for the complete combustion of the gas. At the top it must be provided with a cover and flue pipe, for carrying away the products of combustion. The flow and return openings must be not less than the water pipes to be heated—say, 3 inches in interior diameter; and the burner must be constructed to consume the maximum and minimum quantities of gas with perfect combustion. It must not fire back under any conditions; and when not required it must automatically shut off all the gas except the supply to a small pilot jet, which will at once reignite the gas at the burner when further heat is required. The consumption of gas must be controlled by the temperature of the conservatory, and automatically increased or diminished within fixed limits, which may easily be determined. When we have such a boiler—and there are no inherent difficulties in its construction — we shall, I am confident, have a wide field for the further development of coal gas for conservatory heating; and my principal object in writing this paper is to direct the attention of makers into this particular groove. It will be a profitable one both for them and for the gas producer.

Having outlined the possibilities which are to be attained in this direction, I will now give briefly the results obtained from an arrangement I have recently fitted up at Bestwood Lodge for the Duke of St. Albans. The conservatory is 41 feet 6 inches long, 26 feet wide, and 24 feet high from floor to apex of roof. The glass surface is 1965 square feet, and the cubical capacity is 19,162 cubic feet. The heating pipes are 3 inches in diameter; having a surface area of 431 square feet. The pipes were already in. The boiler is constructed of sheet copper, 15 inches in diameter and 2 feet high, with 1-inch vertical copper tubes, capped at the top, and fitted with a flue pipe for carrying off the products of combustion. The burner (atmospheric) is boxed in at the bottom, and perforations are made for the admission of the necessary quantity of air to insure complete combustion. The burner is of the ring type, with separate taps. The boiler is placed in a second conservatory, which it heats by radiation ; and the flow and return pipes have to pass outside a distance of 25 feet before they enter the large building, so that the conditions are entirely against obtaining favorable results. With a consumption of 60 cubic feet of gas per hour, the temperature of the large building was maintained at 66° with an outside temperature of 46°. The temperature of the flow and return pipes (which, by the way, are reduced to 1 inch diameter at the boiler) are as follows: Flow, 132° F.; return, 87° F. The effluent gases leaving the boiler were at 380° F., and their analyses (average of series of tests) were as follows:

	Per cent.
Carbonic acid	6.0
Oxygen	8.6
Nitrogen	85.4
Total	100.0

From these results the following defects are apparent: 1. The heating surface is deficient, the effluent gases being allowed to escape at too high a temperature. 2. Too large a proportion of air is permitted to enter with the gas. 3. The flow and return pipes at the boiler are much too small. 4. The radiating pipes are much too large for the boiler—*i. e.*, a much larger boiler is necessary for effective work.

I ought to mention that the whole application has been carried out as an experiment, with a view of determining the more correct proportions to adopt in the permanent installation, and to find out, on a practical working scale, how far it is possible to utilize coal gas for such a purpose with due regard to economy. On some future occasion I may have further information on the subject, which will probably be of a wider general interest to the gas industry.



Radiator Screen.

Radiator Screen.

An ornamental screen for use over radiators is being introduced by E. T. Barnum, Detroit, Mich., as shown herewith. The screens are generally made of twisted, quarter twisted or crimped brass, polished steel, bronze or copper, and of any size mesh and finish, or of other material if preferred. They are referred to as concealing the pipes or coils and as an improvement to the gen-

eral appearance of any room. The top may be of polished marble, as illustrated, or it may be of the same material as the sides, shaped oval, square or as desired.

HEATING NOTES.

Lockwood & Adams, 69 Centre street, will represent in New York this year the Holland Radiator & Mfg. Company. The new firm propose to make a push on their line of radiators, which is to have some new additions. D. A. Crowley will continue to travel in the interest of the Holland radiators from the New York house.

The Automatic Heating Company have been organized at Portland, Me., for the purpose of manufacturing machines and apparatus for the Ware Automatic Generator and Regulator. President, A. J. Hodder of Boston; treasurer, Leonard Shackford of Cambridge.

The steam heating establishment of Alger Leonard, Great Barrington, Mass., was visited by fire last week doing slight damage.

John A. Scollay, 74 Myrtle avenue, Brooklyn, N. Y., is issuing a new circular, printed in two colors, of his patent hot water thermometer. The different styles of thermometers are shown by illustrations. The features are a black fluid which can be readily seen at a distance and the ease with which the thermometer can be attached. A stationary cup is arranged to screw into a hole threaded for ¼-inch pipe. The thermometer is then set in the cup.

L. R. Blackmore, 88 John street, New York, on December 25, 1894, was granted a patent for a house heating boiler, to be used as a hot water apparatus or as a steam generator, for which it is said to have special advantages. It is of the vertical, sectional type, with provision for internal circulation and arranged to permit steam globules to rise to the steam chamber unhindered by the heating surfaces, so that, it is claimed, no difficulty will be experienced in maintaining a regular and steady water line. The feature of the boiler is the large surface exposed to the direct heat of the fire, which is accomplished by the arrangement and construction of the waterways. The boiler is provided with a device for heating air for admission to the combustion chamber to aid in consuming the gases and to prevent trouble from soot when soft coal is used. It is provided with a direct draft damper which, when closed, causes the products of combustion to make a downward turn and pass to the back of the boiler before escaping. The flues are so arranged that the draft affects all parts of the grate alike.

The Sperl Heater Company, Carbondale, Pa., have completed the equipment of their shop, and are now moving into it. The new plant consists of a machine and erecting shop and a boiler house, but there is ground enough upon which to build a foundry if it is deemed advisable to do so in the future. The boiler house is 32 feet long and 24 feet wide, and contains a horizontal return tubular boiler 48 inches in diameter and 14 feet long, rated at 50 horse-power. The machine and erecting shop is a two-story brick building 40 feet wide and 60 feet long, built on the plan of slow burning mill construction, fitted up with an overhead traveling crane covering its full length on one side. There is a tool and supply room in one corner downstairs and a temporary office upstairs. There are all needed toilet facilities and sanitary appliances. In the way of machine tools the shop is well equipped.

C. H. Barnes, who represents the American Boiler Company in Colorado, with headquarters at Denver, has been spending a few days at the Chicago office.

Lord & Burnham Company, manufacturers of greenhouses and greenhouse heating apparatus, have transferred their architectural department from Irvington, N. Y., and in future all preliminary plans, estimating and negotiating will be done from their office at 160 Fifth avenue, corner Twenty-first street, New York.

The John Davis Company, 69 79 Michigan street, Chicago, are doing the steam heating in the New Music Temple, Van Buren street, between Michigan and Wabash avenues.

Kroeschell Bros. Company, 41-59 Erie street, Chicago, are to install a steam heating plant in the Fort Dearborn 12-story office building, Clark and Monroe streets.

The following are the recent additions made to the selling force of the J. H. McLain Company, Canton, Ohio: E. A. Peacock at the Chicago office of the company, 88 Lake street; J. A. Farrell, who will travel from the Chicago office through Iowa, Illinois and Missouri. From the Canton office W. M. Klngsbury will travel in Northern Ohio, Northern Indiana and Michigan, and W. J. Blackmore will travel in Southern Ohio, Western Pennsylvania and West Virginia. J. B. Crowl, formerly with May & Fieberger of Akron will travel from the Canton office in Ohio and Michigan in the interests of their Oxford furnace only. J. H. Coleman, Jr., with headquarters at the New York office, will travel through the New England States, while George W. Plastow, heating engineer, formerly with Johnson & Morris of New York, will visit the city and suburban trade from the New York office.

The Specialty Mfg. Company of Waterbury, Conn., issue circulars calling attention to the Waterbury heat regulator, adapted for use in connection with hot air furnaces and steam and hot water apparatus. A number of testimonial letters, which occupy a large part of the circular, give an idea of the favor with which the device has been received at the hands of the trade.

Isaac A. Sheppard & Co.'s Exhibit.

Isaac A. Sheppard & Co., Philadelphia, have just completed an exhibit in the Builders' Exchange Permanent Exhibition in that city which is the largest to be found in the exhibition. It is situated in the northwest corner of the spacious exhibition hall, inclosed within a handsome gilt work screen, having an arched entrance, and occupies an area of about 300 square feet. A neat sign, surmounted by a model of a Paragon furnace, attracts attention upon entering. The center of the floor is devoted largely to the firm's well known Paragon steel drum furnaces. Six styles are shown, with and without casings, so that both interiors and exteriors may be readily seen and examined. Paragon furnaces are so constructed that the draft in their two combustion chambers is equal, thus making equal radiating surfaces. This equal distribution of heat is said to add to the endurance of the furnaces. The self cleaning arrangement of the drums and the large radiating surfaces are conspicuous in the interiors; and the small number of joints to be found is evidence of the gas and dust proof qualities possessed by the furnaces. The ball bearing frictionless grate is also an interesting feature. The later productions in the Paragon line will be supplied with either frictionless draw center or triplex grates, as may be desired. A No. 440 Paragon with cast radiator represents a line which the firm will shortly furnish in four sizes. A corner of the inclosure is occupied by a brick set paragon furnace with cast iron front. "Because a furnace is located in a cellar or basement is no reason why it should be ugly," was once remarked by a member of the firm; but the very handsome Renaissance design of front shown in this furnace would certainly make one wish that a better location could be accorded it. The upper panel of the front is removable, to allow of access to the drum. The front extends above the top of the radiator, so that the whole furnace may be withdrawn for repairs or other purpose without disturbing the brick work. The paragon line will shortly be augmented by the addition of a combined hot air and hot water heating furnace, to be made in three sizes. Other furnaces shown are the Saxon and Excelsior, as representatives of cheaper lines of effective furnaces; and the Fidelity, a first-class furnace, having a heating capacity somewhat less than the Paragon, and made in three sizes.

Arranged along the outer sides of the square are the ranges. A No. 88 Excelsior with double oven represents the firm's well known Excelsior line of ranges, of which there are nearly 100,000 in daily use in Philadelphia and vicinity. In these ranges the excellent flue construction is a leading feature. A Royal Fidelity No. 88 with horizontal boiler is shown as a specimen of another line of first-class ranges. A feature in this range is a cast iron shield of ornate design, used in connection with a cast iron mantel to cover the boiler and thus shield the operator from the boiler radiation. Another range of the same line is shown in connection with an ordinary upright boiler. Both ranges have hot air attachments for heating upper rooms. The Fidelity line of ranges is represented by two styles, a No. 80 with the regular horizontal boiler and a No. 7 without a boiler. The latter has a gas stove attachment to the plate warmer, designed for use in summer, instead of a separate gas stove. The attachment is especially applicable for use in flats and other places where economy in kitchen space is desirable. The Fidelity ranges have the same flue construction as the Excelsior.

A No. 6 Franklin fire place heater is shown as a ssmple of a line consisting of two sizes, with or without magazines, and with round or square fronts in nickel or Berlin black finishes.

While the exhibit does not cover the whole of the firm's products, it may be said to represent the lines most closely allied to the building trades.

New canning factories to the number of 102 were established in the Southern States last year, according to the *Tradesman*.

THE RETAIL STORE.

Poetry in Trade.

From a well known jobbing house in Tennessee we have the following communication, which explains itself:

As an illustration of the fact that it is no use for the Hardware dealer to try to "best" the school teacher in a war of words, we give a letter received to day from one of our customers, a teacher, who had bought a Gun of us some time since. We wrote him that, "owing to our impecuniosity we would like to have a litle reciprocity" in the shape of a check by return mail for the amount of his account. But he completely knocked us out with the following response:

With considerable curiosity,
And accelerating velocity,
I perused the gentle verbosity
Of your dun without animosity.

With sorrowful hesitation,
I make the declaration,
That my financial situation
Prevents a prompt liquidation.

With the humblest timidity
In the midst of sore turgidity,
I ask you to relinquish rigidity
And trust to my eager rapidity.

With candid and earnest and feeling sincerity,
I promise to use my utmost celerity.

Yours in adversity;
Not in perversity.

Steam Sterilizer.

The accompanying cuts represent a steam sterilizer offered by Silver & Co., 304-314 Hewes street, Brooklyn, with New York office 20 Warren street.



Fig. 1.—*Steamer.*

Into the bottles shown in Fig 2 is placed the proper quantity of milk, to which is added the proper quantity of barley, or oatmeal or gruel, or fresh water, to which is added sugar. The proportions to be used are indicated upon a food table accompanying the sterilizer. The bottles are then placed in the tray, Fig. 2, using the rubber bottle stoppers. The tray, with the bottles, is then placed in the steamer, together with water, the lid put on the steamer and the water allowed to boil vigorously over a fire for three quarters of an hour. The cup shown in Fig. 3 is provided with folding handles and a perforated false bottom,



Fig. 2.—*Tray and Bottles.*

and is for warming the sterilized milk for feeding. A funnel and bottle cleaner are furnished with the set, as in



Fig. 3.—*Milk Warming Cup.*

Fig. 4. The set, complete, is packed in a wooden case with a hinged cover, occupying a space 14 inches high and 9 inches square. The set includes a



Fig. 4.—*Funnel and Bottle Cleaner.*

steamer with quick boiling corrugated copper bottom, a bottle tray, seven graduated glass bottles, seven ventilated rubber corks with glass plugs, warming cup, funnel and bottle brush.

Gasoline Goods.

This is the season when the dealers of gasoline cooking apparatus are beginning to purchase, and the new goods are making their appearance. The enormous trade now done in this line is a satisfactory vindication of those who met with almost insurmountable obstacles in the introduction. Insurance is no longer a bugbear, as there are many companies broad enough to see that the element of danger, which was exaggerated for a purpose, has been almost eliminated by improved construction and familiarity that has come by using the fluid. The comfort and convenience have led to the use of gasoline cooking stoves all the year round in many households, some other means than the cooking apparatus being depended on in winter to supply heat. While what is known as the New Process stove has come rapidly into popularity and supplies a large part of the demand, the generating burner still has a large following in the colder sections of the country where evaporation is hindered by the low temperature in the winter season. The goods of to-day are far simpler than those first introduced and do not require as much attention or repairs. For cooking, where artificial gas cannot be secured from a gas plant, gasoline is destined to grow in favor and stay in the field. The only care needed is such as a careful housewife would give any apparatus. It must also be borne in mind that the fluid is very volatile, and a leak in the can or reservoir may lead to disastrous consequences if a flame is brought in contact with the gas. Dealers now thoroughly understand the necessity of care in this matter, and explain it to buyers, so that it is only through the utmost negligence that an accident can happen.

Dietz Crystal Lantern.

R. E. Dietz & Co., 60 Laight street, New York, have brought out the Dietz New Crystal Tubular Lantern, with

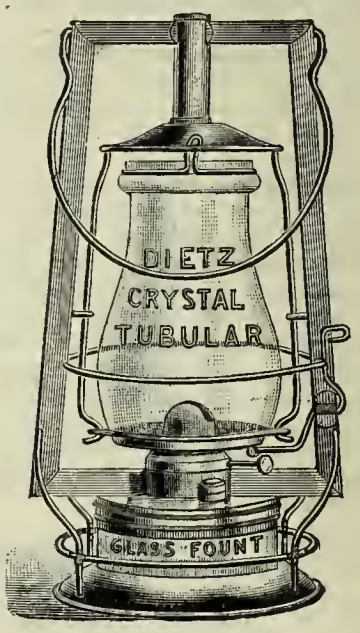


Fig. 1.—*Dietz Crystal Lantern.*

removable glass fount, as shown in the accompanying cuts. It is referred to as strongly made, and special attention is drawn to the transparent glass fount, which is adequately guarded. In case of an accident to the fount, a new one can be as easily substituted as a globe. Fig. 1 represents the lantern in normal condition. Fig. 2 shows the side wires supporting the bottom and holding the

fount in position, detached so that the fount can be removed or replaced. Fig. 3 indicates the method of raising the

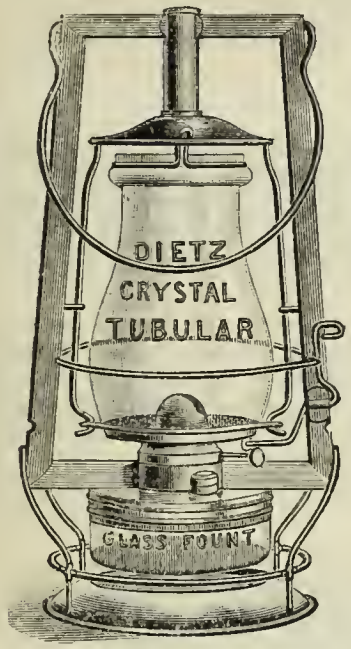


Fig. 2.—Bottom Wires Detached.

globe for the purpose of trimming or lighting the wick. The lantern is 14

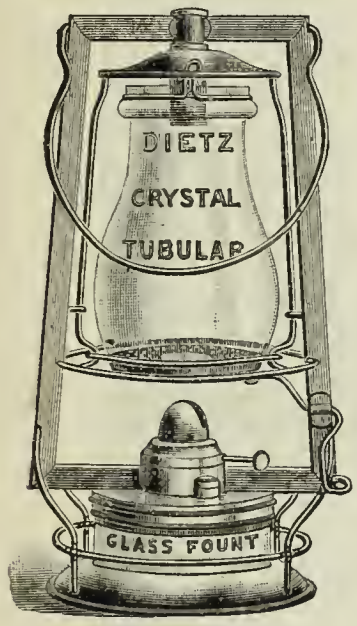


Fig. 3.—Side Lift for Raising Globe.

inches high, takes a No. 1 burner, $\frac{5}{8}$-inch wick and No. 0 globe.

MEMORANDA.

E. A. Blanchard of Springfield, Maine, and E. W. Bradeen of Old Town, Maine, have purchased the stove, tinware and plumbing business of Daniel Sawyer, and will take possession April 1. Mr. Blanchard has been in the same business in Springfield, and Mr. Bradeen has been connected with Mr. Sawyer's establishment.

W. A. Guenther & Sons, Owensboro, Ky., have adopted a rather unusual as well as a novel form of circular, calling the attention of retail customers to their stock of Hardware, Stoves, Mantels, Grates, &c. The circular is a strip of paper 2 inches wide and 2 yards long, rolled on a wooden spool. Different lines of goods are treated under numbered headings, of which there are 17. Attention is also called to a plan of guessing, by which a $60 steel range is given to the successful cash customer.

Showcase Refrigerators.

Among the refrigerators put on the market for the coming season by the Challenge Corn Planter Company, Grand Haven, Mich., for whom Barnard B. Neal, 106 Chambers street, New York, is agent, are the two shown in the accompanying cuts. The refrigerator shown in Fig. 1 is referred to as being neat in appearance and as filling the requirements of a refrigerator and a showcase in which there is a perfect circulation of cold air. It is particularly designed for the use of butchers, allowing the display of cut meats, fresh and juicy, in plain view of cutomers and yet protected from heat, dust and flies. The refrigerator shown in Fig. 2 has glass on three sides, while the panels around the ice chamber are of beveled plate mirrors. The ice door is on the back of the case. It is remarked that the case is made of kiln dried ash, filled and finished in antique with shellac and coach varnish, and that the case is provided with the company's new air tight lock. This refrigerator is designed for the use of restaurants, grocers or florists.

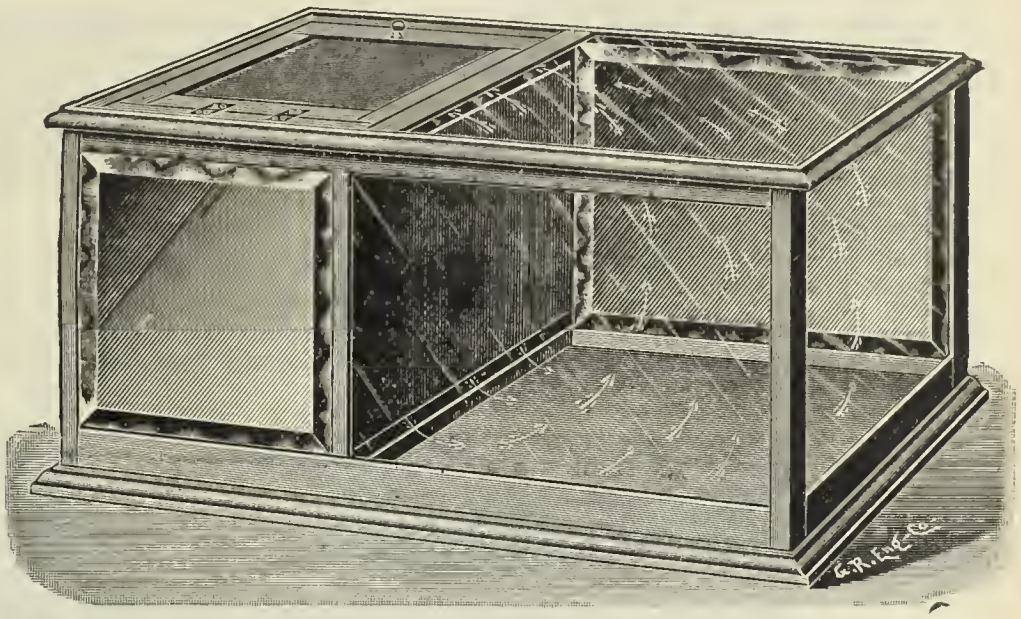


Fig. 1.—Showcase Refrigerator.

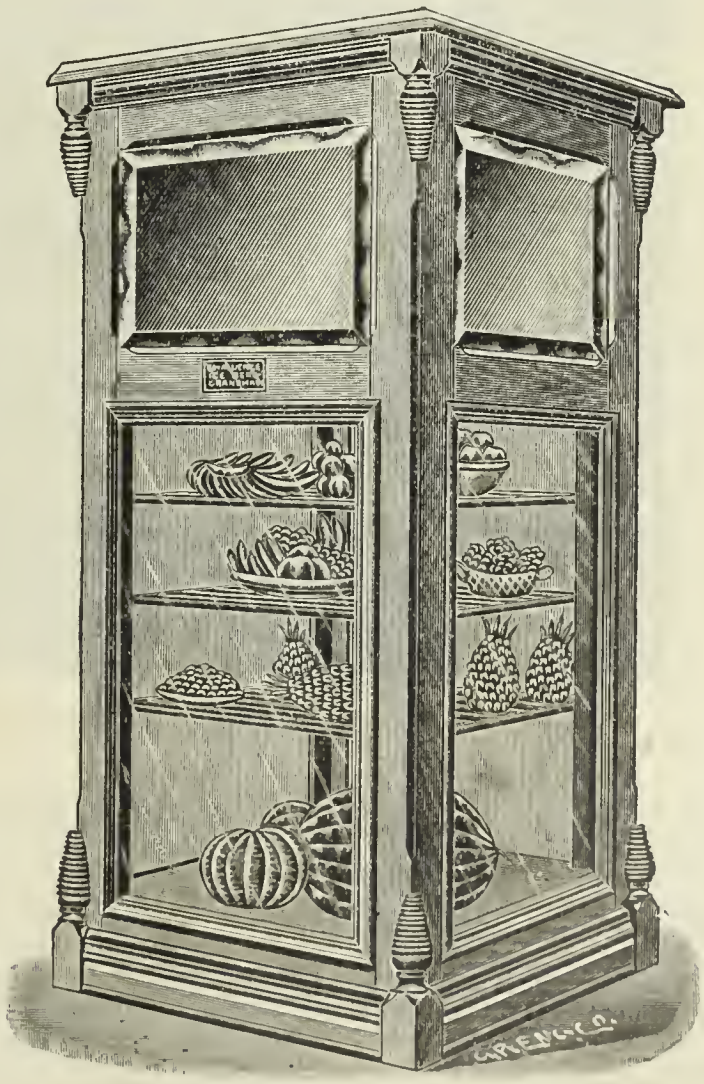
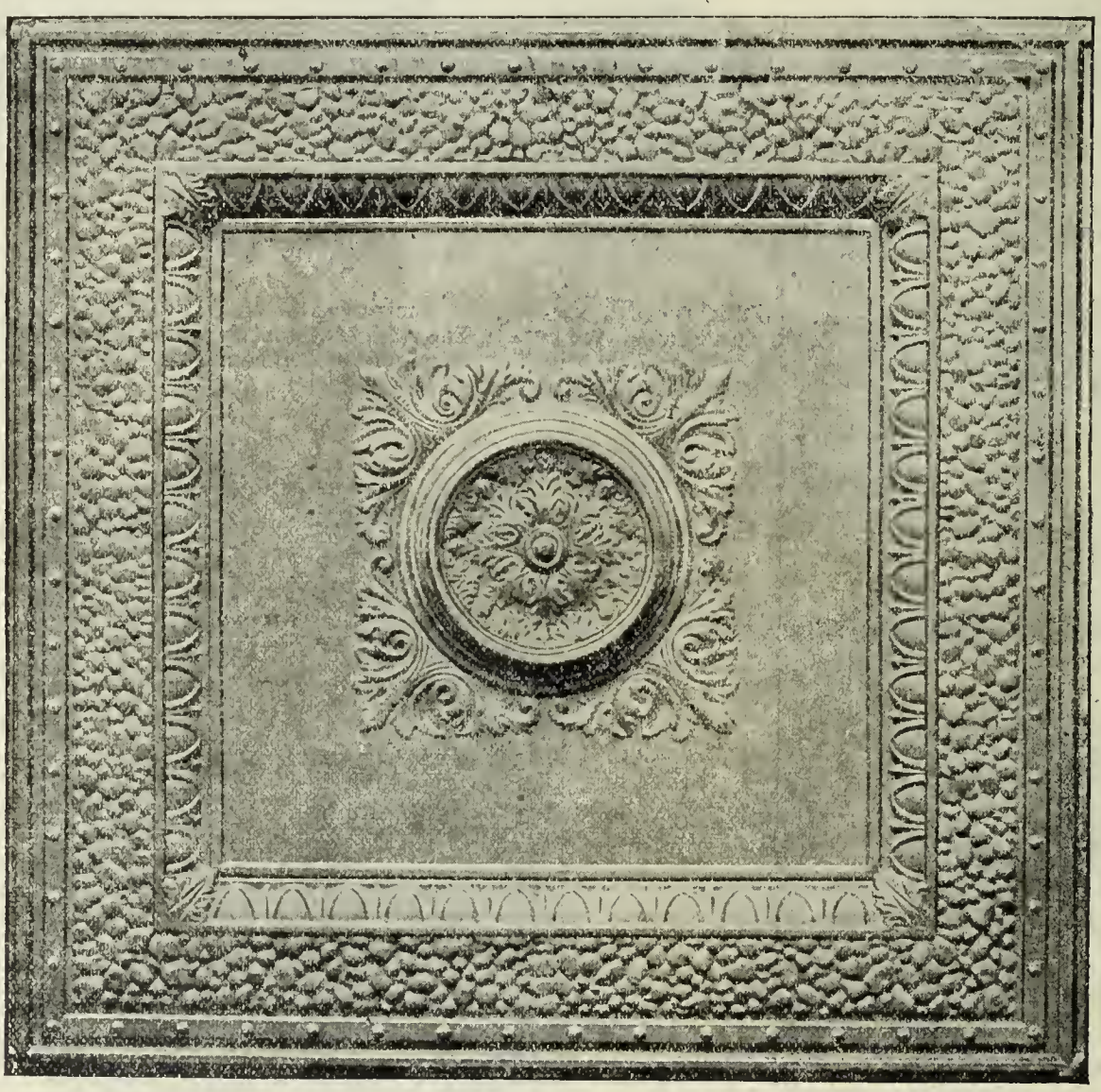


Fig. 2.—Refrigerator for Restaurants, Grocers, &c.

ROOFING AND CORNICE.

Ceiling Panel Plate with Enriched Center.

The accompanying illustration shows a piece of very handsome sheet metal work, the product of the Penn Iron Roofing & Corrugating Company, Limited, Philadelphia. The illustration is of the German Renaissance pattern of ceiling panel plate, and the design is accurately reproduced in the engraving, which brings out clearly its many attractive features. The plates cover 31¾ inches square of space after making the dovetail lock joint lap, which is dustproof and requires no extra work in puttying and closing. It also forms a separate finished center in itself when desired and when applied wholly as a ceiling in combination with the enriched coves, borders, moldings, &c., of the same manufacturers. The plate is made without the enriched center or with complete centers of any styles. The plates can be worked in combination with the art steel ceiling plates of this firm, and can be so arranged as to combine with beam or drop girder designs and rich corner blocks in the combination, when so desired. A great deal of time has been spent in the preparation of this new plate, which is stamped from a solid sheet of steel. The pressure needed to make its form will be understood when it is stated that it takes 34 inches square of flat material under a pressure of 650 tons, by several operations, to bring the plate up to its finished form with a 1¾ inch depth of molding. The firm, we understand, have been experimenting over five years in perfecting this operation.



Ceiling Panel Plate with Enriched Center.

FLASHINGS.

T. C. McDonald Roof Paint Company have opened an office at Savannah, Ga., and will manufacture there the McDonald roof coating paint and roofing cement, of which they are the sole proprietors.

E. C. Atwater & Co., Springfield, Mass., have been awarded the contract for the cornice, gutters and ventilators and also for the tin covering of the Highland Brewery, at Springfield.

The Cortright Metal Roofing Company, Philadelphia, with Chicago office at 134 Van Buren street, manufacture an extensive line of roofing materials, including metal slates, Victoria shingles and trimmings for ridges, hips, valleys, &c. These goods are made of tin plate, galvanized steel or copper, as may be desired, and are highly spoken of for their ornamental appearance as well as for their efficiency. The manufacturers advise us that the tin plates used are full weight and that they do not handle light plates or wasters. They also call attention to the reduced price of tin, which enables them to sell their product at low figures.

According to a recent issue of the Bethlehem *Times* the Slatington-Bangor Slate Syndicate of Slatington, Pa., enjoyed an exceedingly gratifying demand for their specialties during the year just brought to a close. It is stated that they sold and shipped more than 1300 cars of roofing slate, aggregating 57,000 squares, and more than 180,000 square feet of slate blackboards, this being nearly double the quantity sold in 1893. The syndicate made shipments from more than 40 different quarries during the year, sending the product into nearly every State and Territory, as well as Canada and Mexico. The success which the company have achieved is due in no small degree to the business enterprise and sagacity of Manager James L. Foote, who reports that the outlook for the present year is very flattering. He is of the opinion that the demand for slate will exceed that of any previous year and that better prices will prevail. It is stated that the company have already booked orders for spring shipment for

more than 7000 squares, and it is the expectation to market fully 100,000 squares of roofing slate before the end of the year. The leading brands are the "American Bangor," "Pennsylvania Queen," "Old Reliable Big Bed" and "Star Union."

BUYERS of eave troughs will be interested in the revised list printed in our Trade Report this week giving the prices adopted at the first regular meeting of the United States Eave Trough and Conductor Pipe Association, held at Cincinnati, January 9.

top of the large card used, while to the lower part are attached leaves for the several months as well as a full card calendar for the year. Casual attention is called to their Perfection steel roofing, Gilbertson's Old Method roofing tin, and general roofing and tinsmiths' supplies.

A Specimen of Fine Copper Work.

Schaeffer Bros. of Chicago have recently made and put in position the



A Specimen of Fine Copper Work.

EBERTS BROTHERS COMPANY, Limited, Detroit, Mich., favor us with a calendar for the current year. The decoration of the publication, which is a prominent feature of it, is a winter landscape, replete with snow and ice. The background and avsilable spaces are filled with references to the business of Messrs. Eberts, telling what they deal in and what work they do.

FRANK VOIGHTMANN, 129 131 Franklin street, Chicago, is doing the copper and galvanized iron work, slate and tile roofing on the Court House at Fort Worth, Texas.

THE ILLINOIS ROOFING AND SUPPLY COMPANY, 203 Lake street, Chicago, have issued a finely illustrated wall calendar. A spirited engravlng adorns the

copper cornice work, metallic roofing, bay windows, light courts and skylight work on the handsome and unique Viking Block, corner of North and Washtenaw avenues, Chicago. F. Knudsen is the architect and O. A. Knudsen the owner of the building, which is 132 x 51 feet, four stories high. A great deal of copper work was required for the ornamental cornice and for the bay windows. Two banks of bay windows project from the side. The design of the building being of a decidedly ornamental character, it was necessary that the copper work should correspond. The block is surmounted by four towers, giving the top an appropriate finish. These towers are also covered with copper. The main tower is on the corner of the building at the junction of the two avenues, and is built considerably higher than the others. At its apex, 109 feet above the street level, is placed a large model of the Viking ship of World's Fair renown, made of 14-ounce copper. An illustration of this ship is herewith given.

Charles Schaeffer, 928 North Tallman avenue, Chicago, who designed and constructed this handsome piece of work, has furnished us with the following details of its dimensions, &c.: The length of the hull is 4 feet; depth, 11 inches; width, 12 inches; hight, from keel to pennant, 5 feet. The globe shown underneath the ship is 15 inches in diameter. The ship revolves on glass bearings, which are placed part way up in the mast on the upper end of a 1¼-inch iron rod that extends down into the cupola. On these bearings the ship revolves, responding to the slightest change in the direction of even the lightest breeze. The hull is made so as to withstand the pressure of very heavy winds. It is strongly braced, and is extremely rigid in every particular. The ropes, which are made of wire, are ¼ inch thick. Owing to the fact that the ship has no deck, the bottom of the keel is perforated at intervals along its length with ⅛ inch holes to allow water to escape. The planks of the hull, the seams in the sail, and the figure at the prow with the finial at the stern are all skillfully reproduced in the beaten copper. The excellent character of the work has attracted much attention, as the elevated position of the ship enables it to be seen for a great distance in every direction, and the observers approach it to get a better view.

A movement is on foot in Philadelphia to secure for the School of Industrial Art of the Pennsylvania Museum the balance of the fund left to the city in trust by Benjamin Franklin for the benefit of poor artisans. Petitions are being circulated for this purpose, setting forth the claims of the school and its advantages to the artisans and textile workers of Philadelphia. It is argued that as the apprentice system is now defunct in the city there is no object to which the fund could be diverted which is more in line with the distinguished testator's intentions.

An electrical expert, quoted in a New York journal, puts out the following danger signal: "I have a word of advice to give people who carry steel rod umbrellas these wet days. They must keep a sharp lookout for arc lights while pushing their steel rods through the air. Of course this only applies when the current is on, and when it is, if the umbrella rod comes in contact with the lamp, there is a strong probability that the holder will be very badly shocked, if not seriously injured."

The annual summary of shipping arrivals in the port of New York during the past year, compiled at the Barge Office, shows that 4761 vessels arrived from foreign ports in that period. Of this number, 2984 were steamships. Englsnd heads the list with a total of 2383 vessels, the United States coming next with 1125. Germany and Norway take the third and fourth places. Vessels of other nationalities coming to this port were as follows: Holland, 152; France, 96; Italy, 92; Belgium, 77; Spain, 59; Denmark, 34; Portugal, 24; Sweden, 8; Russia, 6; Austria, 6; Hayti, 4; Hawaii, 3; Brszil, 2.

TIN PLATES.

The Tin Plate Wages Dispute.

On Monday, the 14th inst., a meeting was held in the Monongahela House, Pittsburgh, attended by a number of tin plate manufacturers and representatives of the Amalgamated Association. The firms represented in person at the meeting were New Castle Steel & Tin Plate Company, New Castle, Pa.; the Cumberland Steel & Tin Plate Company, Cumberland, Md.; Falcon Tin Plate & Sheet Company, Niles, Ohio, and Ætna-Standsrd Steel & Iron Company, Bridgeport, Ohio. The meeting was called at the suggestion of several tin plate manufacturers who were desirous, if possible, of ending the long struggle between the tin plate manufacturers and the workmen which was inaugurated some four months ago. The conference convened about 2 p.m. on Monday, and after long arguments from both sides, in support of their respective positions, the meeting adjourned without anything definite having been accomplished.

On Tuesday, however, another conference was held between representatives of the Cumberland Steel & Tin Plate Company and officials of the Amalgamated Association, and a settlement was reached. It will be remembered that the original demands of the tin plate manufacturers were for a reduction of 30 per cent. in rollers' wages and 25 per cent. for doubling and heating. At the above conferences the Amalgamated Association agreed to allow a reduction of 15 per cent. in wages for rollers, and 12½ per cent. in wages of doublers and heaters. Under the old scale wages were based on gauges 29 and 30, rollers being paid $5.30 per ton of 2240 pounds, doublers $2.70, heaters $2.48 and shearmen $1.76. Under the new scale rollers will be paid $4.50 per ton, doublers $2.36, heaters $2.17 and shearmen $1.54.

For heavier gauges than 29 and 30 the reduction is smaller. On Nos. 27 and 28 rollers will be paid 12½ per cent. instead of 15 per cent., and doublers, heaters and shearmen 10 per cent., instead of 12½ per cent.

At the conclusion of the conference the Cumberland Steel & Tin Plate Company signed the Amalgamated Association scale, and later the New Castle Steel & Tin Plate Company, New Castle, Pa., also signed. These concerns who operated their plants right along under the old Amalgamated Association scale will immediately be allowed the concessions just granted by the Amalgamated Association. As to what effect this will have on those plants that are now idle cannot be stated. It is the impression, however, that additional concerns will sign the scale within a short time. The above conferences were held independent of the Tinned Plate Manufacturers' Association, and the presumption is that the firms who have signed the compromise scale will no longer be members of the above organization.

British Tin Plates in 1894.

Griffith's Annual Review of the iron, steel and allied industries in Great Britain for the year 1894 summarizes the condition of the Welsh tin plate industry as follows:

Most of the works in South Wales and Monmouthshire have been halting between stopping and starting throughout the year. Common coke plates were in January sold at 10 shillings 6 pence a box in Liverpool, and penny by penny the price has gradually been pushed down to 9 shillings 6 pence. In October the American tariff was reduced to $1\frac{2}{10}$ cents per pound, and this was accompanied by an immediate increase in shipments to the States, but though the returns for the months since the duty was reduced are much above the average for the year, they are not what was looked for after such long-continued short shipments. In our opinion, as yet, the American manufacturers of tin plates do not know either the weakness or the strength of their position under the Wilson tariff, and equally, we think, the Welsh manufacturers do not know their own hand. The collapse of business in the States in the earlier months of the year threw everything out of gear. On one hand it favored 'domestic' manufacturers by reducing costs; on the other, for a time, it paralyzed the power of the nation to digest (or consume) its own or any other people's manufactures. After the new tariff took effect, the whole of the American works were laid off by labor troubles; now they have resumed with non-union labor; and we shall soon be able to judge where the balance of power lies—*i. e.*, whether or not the $1\frac{2}{10}$ cents per pound duty is sufficient to turn the scale in favor of America. It has always been our opinion that cheap labor was not sufficiently plentiful in the States to enable tin plates to be made there so economically as in South Wales, and therefore we hold, on economic grounds, that South Wales, and not America, is the place to make these things. If the whole process can be carried out mechanically with satisfactory results, then, duty or no duty, South Wales would at once lose her hold on the American market. The course of events in the tin plate trade this year will be watched on both sides of the Atlantic with peculiar interest.

SCRAP.

Two existing tin plate manufacturing companies are said to be contemplating the removal of their plants to Burgettstown, Washington County, Pa.

THE COMPLETED RETURNS of shipments of tin and terne plates from Great Britain to the United States during the past year show a total of 226,879 tons, against 255,583 tons in 1893, 276,479 tons in 1892 and 325,145 tons in 1891.

MARSHALL BROTHERS & Co., Philadelphia, Pa., send out a very tasteful calendar for the current year. It is a large sheet carrying the usual tablet of monthly calendars. The upper part presents the firm's name and calls attention to American tin and terne plates, besides giving the location of their offices and mills. Besides tin plates this firm make pickled and cold rolled sheets for tinning, lead coated sheets and corrugated sheets.

THE REYNOLDS BROTHERS CAN MFG. COMPANY, Havre de Grace, Md., have been incorporated to manufacture tin plate. The directors are Wesley M. Reynolds, William Vincent and others, and the capital $25,000.

THE ANDERSON FOUNDRY & MACHINE WORKS, Anderson, Ind., are reported as full of orders. They are now working on contracts for tinning machinery for the following concerns: Grest Western Tin Plste Company, Joliet, Ill.; Monongahela Tin Plste Works, Pittsburgh, Pa.; Ellwood Tin Plste Works, Ellwood City, Pa.; Cincinnsti Corrugating Company, Piqua, Ohio; Irondale Steel & Iron Company, Middletown, Ind., and the National Tin Plate Works, Anderson, Ind.

IMPORTS OF TIN PLATES into the United States during the 11 months ended November 30, 1894, according to the returns of the Bureau of Statistics, were of the value of $10,896,819, as compared with $14,764,333 in the corresponding months of the previous year.

B. F. BUTLER, JR., Mason Building, 70 Kilby street, Boston, who has been for some time the Boston agent of the Pottstown Iron Company, has also been appointed New England representative of the Phillips Tin Plate Company of Philadelphia. This company's product is high grade bright tin and terne plates.

THE LLANGENNECH TIN PLATE WORKS, Llangennech, Carmarthenshire, and the Melyn Works, Neath, Glamorganshire, South Wales, are reported as having restarted this week.

THE TIN PLATE WORKERS formerly in the employ of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., and who propose to put up a co-operative tin plate plant at a cost of $40,000, have been offered two free sites. One is in Port Vue, opposite McKeesport, Pa., and the other in Versailles borough. A Board of Trade committee will look into the project and decide upon the suggestion to offer a bonus of $10,000 to the new concern to

locate in McKeesport. It is stated that subscriptions aggregating about $25,000 have been received from the workmen.

THE WELL KNOWN New York tin plate and metal importing house of Robert Crooks & Co. have established themselves in their new quarters at 138 Front street, where the firm occupy the whole of the first floor. They are now in possession of a suite of commodious offices, handsomely appointed and affording much greater facilities than were found in their former location.

A FEW OF THE TINNING POTS in the new plant of the Monongahela Tin Plate Company, at Pittsburgh, have been put in operation, and it is expected that some of the black plate mills will be started up before this month is out. So far the concern have been buying black plates in the open market.

THE NEW CASTLE STEEL & TIN PLATE COMPANY, New Castle, Pa., contemplate making some extensive additions to their plant, the nature of which has not as yet been fully determined.

"TIN COATS" is the title of a neatly gotten up little 8 page pamphlet distributed by Henry W. Scattergood, Black Diamond Tin Plate Works, Philadelphia, containing information and advice regarding roofing tin in general and Scattergood's Black Diamond plates in particular. The text is diversified with cleverly drawn cuts of colored folks, each picture having worked into it the trade-mark of the concern—a black diamond.

THE PENNSYLVANIA TIN PLATE COMPANY of New Kensington, Westmoreland County, Pa., were chartered at Harrisburg this week with a capital of $200,000. This is the company who will operate the large tin plate plant now being erected at New Kensington by the firm of Goldsmith & Loewenburg.

Trade Notes.

THE JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, New Jersey, are distributing a third edition, revised for 1895, of their pamphlet, entitled, "Graphite as a Lubricant Scientifically and Practically Considered; Also Its Value as an Accessory for Engineers and Machinists." The pamphlet is an interesting publication for those who desire to learn about the advantages of graphite for the purposes mentioned.

THE GRISWOLD MFG. COMPANY, Erie, Pa., on December 17, 1894, commenced suit in the United States Circuit Court at Minneapolis, Minn., against William Donaldson & Co. of that city for infringing their patent No. 229,250 on the the American Waffle Iron, the charge being that they were continuing to handle a waffle iron which the Supreme Court had declared was a direct infringement of the above-mentioned patent. The Griswold Mfg. Company were immediately granted a preliminary injunction against them from handling this waffle iron in any way, and on the 9th of January this injunction was continued against Donaldson & Co. from any further infringement of such letters patent on the American Waffle Iron, which patent the United States Court of Appeals has fully sustained. The Griswold Mfg. Company advise us that while they do not intend to bring suits against their friends in the trade, they are desirous of protecting their rights against those who willfully insist on disregarding their rights in this matter.

A FULL PAGE ADVERTISEMENT in this issue contains the interesting announcement of the F. H. Lawson Company, Cincinnati, Ohio. This firm are manufacturers of Tinware, Japanned Ware, Ironware and various specialties, including Street Lamps, Galvanized Oil Tanks and Cans, Water Coolers, Coal Vases, &c. They also are importers of and dealers in Tin Plate, Copper, Brass, Sheet Iron, Tinners' Tools, Tinners' Supplies, &c. A feature of the announcement is the reference to Lawson's Old Process Guaranteed Roofing Plate. This firm were established in 1816 and some illustrations show the various warehouses they have occupied.

THEIR MANY CUSTOMERS will regret to learn that the offices and warehouses of Ledwidge & Co., dealers in tinners' supplies, at 234 Lake street, Chicago, were closed by the sheriff on the 11th inst., on heavy confessions of judgment. The firm, which was composed of Matthew Ledwidge as sole manager, had one of the largest jobbing businesses in that line in the city, but it is estimated that the assets will not exceed $20,000, while the confessions entered pass that amount by several thousands of dollars. They were as follows: C. H. B. Sheet Milling Company, $5023; Clark, Quien & Morse, Peoria, $3500; C. S. French & Co., New York, $5023; Falcon Iron & Nail Company, Niles, Ohio, $6500; Revere Copper Company, Boston, $1500. There is another confession in favor of an uncle of the defendant, a London capitalist, for $2500. The sheriff took possession of the Lake street offices first, and, not finding sufficient property to satisfy the judgment, levied on the warehouse under the West Randolph street viaduct. It was filled with sheet steel and iron and tin plates. It is said that Mr. Ledwidge attempted to carry on a large business with a small capital and overtaxed his credit. All the confessions entered were, with one exception, on notes given for stock bought on credit. The firm were supposed to do a business amounting to $200,000 annually. Mr. Ledwidge established the business six years ago.

NATIONAL WRINGER & MFG. COMPANY, Canton, Ohio, are very busy, running 100 men ten hours a day and four hours at night. During 1895 they expect to do the largest year's business in their history, and are now making arrangements for the erection of an additional factory.

KEUFFEL & ESSER COMPANY, New York, issue an 1895 illustrated catalogue of over 400 pages, which is not merely a reprint from former ones, but has been rewritten, revised and enlarged by more than 100 pages. While the company confine themselves strictly to their line of business—Drawing Materials and Surveying Instruments—they have endeavored to omit nothing in this line which is good and reliable, and the catalogue therefore represents, it is remarked, the latest real improvements and the progress made since their last edition. There is also a large amount of explanatory matter, such as a short treatise on Drawing Paper, explanations about Drawing Instruments, of Planimeters and similar instruments, a description of the progress of Surveying Instruments, an illustrated paper on Verniers and their application, &c. Distributed through the book are a number of views of the several departments of the company's store and factories.

WILLIAM M. GOBEILLE, Main and Center streets, Cleveland, Ohio, is sending circulars to the trade directing attention to his facilities for making patterns. An announcement which is printed on a postal card is a clever bit of rhyming, printed, however, as ordinary prose.

THE WOODSTOCK OIL CAN COMPANY, Woodstock, Va., have been organized with J. C. Baker, president; I. R. Irwin, secretary; George W. Koontz, treasurer, for the purpose of manufacturing an improved oil can.

WALLACE & SONS, Brass & Copper Rolling Mills, New York, issue a notice that their new catalogue for 1895 will soon be ready for distribution, which will contain the latest revised price-list of goods of their manufacture that are in force at the time.

THE HEATING TRADE will be interested in the announcement of the American Boiler Company, 84 Lake street, Chicago, and 94 Centre street, New York, which appears among our advertisements this week. Reference is made to their extensive line of Steam and Hot Water Heating Apparatus and the trade are asked to write for catalogue and prices.

THE GRISWOLD MFG. COMPANY, Erie, Pa., have just issued a supplementary catalogue of new goods which also directs attention to some of their old leaders. The first articles mentioned are the Erie hollow ware, then the Erie aluminum cast ware. Illustrations are shown of aluminum tea kettles and saucepans and skillets, also lemon squeezers. The next few pages are devoted to the new improved American waffle iron, which is illustrated and described; then the American wafer iron. This is followed by the new improved French waffle iron and the French waffle iron and gas stove; likewise the French waffle stove and the French griddle. Other goods mentioned are the Erie double broiler, the Erie coffee mill, the Erie sliding ice pick, gas blast forge, &c. An interesting article on the superior quality of cast aluminum cooking utensils completes the little pamphlet.

SCHOLZ & WIMMER will in the near future open up with a full line of stoves, house furnishing goods and hardware at 596 Rhomberg avenue, Dubuque, Iowa.

Real estate transactions in New York City since January 1 have been unusually large and indicate a promising amount of business in this field in the new year. Some exceptionally large deals have been consummated. Business property is reported to be in particularly active demand and the amount of this class of investment now on the market falls considerably short of requirements. Flat and tenement houses, dwelling houses and vacant lots are all sought after, notwithstanding the fact that a large number of dwellings stood vacant in the past year.

A contract has been placed for lighting the cars on the Brooklyn Bridge by electricity. The lights will be furnished by the trolley system, each car having 16 lamps of 10 candle power.

According to the computation of the Actuary of the Treasury at Washington, the population of the United States will reach 70,000,000 by the end of the present year.

STOVE TRADE NOTES.

The Local Stove Trade.

Nearly every man, be he ever so charitable, takes a sort of grim satisfaction on learning that adverse conditions affecting the welfare of his own business prevail generally and that others are affected by them as well as he. This satisfaction, poor as it is, and due to the weakness of human nature, is about all that many stove men reaped from their business during the past year. There is no denying, however, that it does tend to elevate the spirits which become depressed in times of poor business, to know that one is no worse off than his neighbors, as it allays uncertainty and accounts for the failure of well considered plans that were confidently relied upon to hold up one's business to, or force it beyond, a certain point, and that his methods were not at fault.

If any man so devoted himself to his own business during the past year to maintain its standard that he found no time to take observations of his neighbors' or to ascertain how it had gone with his competitors generally, it must have been a consolation to him to learn that he probably reaped as much return proportionately to his efforts as any of his competitors.

The year of 1894 made so poor a record for itself that it should not be hard in the new year to eclipse it, and it is encouraging to record that it starts off well. The greatest percentage of decline during 1894 occurred in January, when the stove business fell off anywhere from 40 to 75 per cent., this excessive decline being due to two causes. The main one was the unexpected and unusual sales of heating stoves made in January, 1893, owing to the extremely cold weather which January '94 did not have, and the general indisposition to buying anything until the people had taken their bearings on the opening of the new year to see what harm had been done during the great financial storm of the year before.

Manufacturers were at sea as to buying material or making goods. In fact they did not need to manufacture, many having run their foundries as long as the holidays for the benefit of their employees, thus giving plenty of stock on hand. The consequence was that foundries were closed indefinitely, and they deferred making contracts as the market at that time was a falling one, the poorest sort to stimulate buying. Jobbers were slow in seeking the manufacturer for the same reason of having carried over a large stock, and they had no anxiety about getting goods when wanted; dealers would not order a single stove they could do without, and urge the sale of anything in stock rather than buy another pattern called for; while the consumer would not buy a stove if he could escape death by freezing without buying one, so that it was as though the stove business from top to bottom had stopped breathing until conditions had been analyzed, bruises examined and losses ascertained, and again until it was learned, if possible, how the tariff cat would jump, or a business man found whether his business really belonged to him or his creditors, and whether it would be more appropriate to make an order or make an assignment.

The stove trade is certainly in a better condition now than it was then. Sales have increased about 20 per cent., and it cannot be attributed to the weather, for though we had some cold days in the first part of the month, it has been warm, rainy and miserable ever since, with a great deal of sickness from colds and grippe, conditions really hurtful to business. So far as the wholesale trade is concerned, the demand has been more general and not increased by larger sales of heating stoves, but by small increases in nearly every variety and every department, including the exporting of stoves. Remittances in settlement of last year's accounts are quite satisfactory in number and amount. Rather more paper is tendered than two years ago, but rather more money than a year ago. It is not well to shout until out of the woods, but to say less for January so far than is here said would be to deprive it of credit that is due.

California Stoves.

Our experience with Californians has always been of the most pleasant character. We have the highest regard for the citizens of the Golden State, and have often been inclined to envy the lot of those to whom Fate has been so kind as to give them the opportunity of residing in a locality whose climate is so universally praised. But there are cynics in the land, and they not only find fault with the climate of California but also speak disrespectfully of California stoves. Following is what one of these dyspeptics had to say in a recent issue of the Chicago *Record:*

This question of window screens in the South is as vexatious as is the stove question in California. Instead of advertising herself as what she is, a superb summer resort, California chooses to be known as a winter resort for invalids. The result is that people in delicate health flock to California in winter and, after shivering for two months, come away with a violent prejudice against California climate. In the sunshine California is lovely; in the shade California is as miserable a spot as ever drove an anæmiac to suicide. The plain truth is that the average temperature (from December 1 to March 1) in California is 60° outdoors; indoors it is 50°—that is to say, it is colder indoors than out.

Col. Mulberry Sellers (he must have been a native of California) used to say that all a person needed in order to keep warm was the appearance of heat. This is evidently one of California's pet theories. There are to be met with in that part of our country some of the most remarkable stoves we ever clapped eyes on. It is commonly reported that California has the biggest liars and the smallest matches in the world; we wonder that the stoves of California are not included in this *bon mot*, for surely it were hard to conceive of stoves more liliputian than these miniature affairs which are called into service whenever the chilled traveler lifts up his voice in expostulation against the alleged geniality of "our glorious climate."

Our friend Leigh Lynch had an interesting experience at Riverside. He arrived late in the evening and ordered a fire in his room, for the night was rainy, damp and cold. After supper he went to his room and sat down to read the newspapers. He felt so chilly that he rang the bell for the porter.

"I must have a fire," said Mr. Lynch, peremptorily. "I ordered one an hour ago, and it is very curious that my order was not attended to. I can't freeze to death; haven't you a stove about the place?"

"Of course we have, sir," said the porter, very much embarrassed; "I built your fire as you ordered, and—and—and you're sittin' on the stove, sir!"

Mr. Lynch arose and scrutinized the object upon which he had been sitting.

"Is that a stove?" he asked, disdainfully.

"Yes, sir," answered the porter, apologetically.

"Bless my soul! so it is," said Mr. Lynch. "I thought it was a new-fashioned kind of campstool!"

An expert scientist who was one of our party in California made a careful analysis of a dozen stoves, representing every size in use in what is termed the perennial (or banana) belt.

He reported (under oath) that the average California stove had a heating capacity of 3.32 of one candle power.

One of the ladies in the party carried off one of these stoves (as we recollect it was the Mammoth No. 1), and wore it as a charm on her watch chain.

Grinberg Brothers, 155 South street, New York, issue a circular of Eagle gas heaters and gas radiators. They are also preparing for the summer trade some new gas cook stoves. In addition to their gas stove business they manufacture a large line of sheet metal goods in stove pipe, adjustable elbows, &c.

ODD PLATES.

FRANK P. MCCONNA, the well-known representative of the Michigan Stove Company at Buffalo, will continue to visit the trade in New York and Pennsylvania in the interests of Garland stoves and ranges.

GEORGE G. GARRY of Indlanapolis, Ind., has accepted a position with the Michigan Stove Company of Detroit, and will represent them in the State of Indiana.

THE FOREMAN of the Buckeye Stove Company has recently been in Mancelona, Mich., dismantling the factory at that place, with a view to removing the machinery from there to the new works at Gladstone, Minn.

DE HAVEN & Co., Limited, of Pittsburgh, Pa., have issued an illustrated sheet printed in colors and folded to a size suitable for an envelope. On the sheet in script letters are the words, to which a hand points, "We ask a question." Unfolding the sheet we find the question to be "Do you handle a range for burning natural gas?" If the question can be answered in the affirmative the company suggest that before placing orders the merits of the Cindrella gas range be examined. They state that the Cinderella will contain some new features for this year, and that its excellence of construction and beauty of design are of a high order. The Cinderella will be ready for the trade about the first of February, and to those who are interested the company will be glad to send descriptive circulars and price-lists.

THE FOLLOWING DIRECTORS have been elected by the Canton Furnace Company of Utica, N. Y.: E. A. Carton, W. J. Carton, J. B. Jones and S. A. Batty.

JOHN T. HYATT, who has been for years the foreman of the mounting department of the stove works of Rathbone, Sard & Co., at Albany, has resigned to accept a responsible position at Troy, N. Y.

MCLANE & SCHANCK, Linesville, Pa., favor us with a very neat calendar for the new year. The card, which has serrated edges, measures 6 x 8 inches, and has an eye for hanging it upon the wall. The upper portion is embellished with a picture representing the old way of making maple sugar, while another picture represents the new way. The latter involves the use of one of the firm's maple evaporators and other kindred appliances. The 12 leaves forming the calendar proper are attached to the lower portion of the card, the printing being in black upon a white ground. Accompanying the calendar is a circular illustrating and describing the evaporators made by the firm.

A. H. DAVE, who for the past three years had represented the Michigan Stove Company in Indiana, has been transferred to the Southern Michigan territory, where he formerly traveled for many years, and where he has a host of friends.

THE large force of employees of Rathbone, Sard & Co. of Albany have been made happy by a resumption of operations, after a shut-down of the plant for two weeks.

THE DANVILLE STOVE COMPANY of Danville, Pa., and 284-286 Pearl street, New York City, have issued an announcement in the shape of a neat folder relative to the spring season of 1895. Attention is called to the fact that the company will offer the trade new lines of gas stoves, four-hole ranges, furnaces, brick set ranges and the Beaver range, made from artistic patterns and executed by skilled workmen. In the line of Monarch gas and gasoline stoves they will offer the New Process, new high and low juniors, with single generating burner; their No. 14 stove improved for 1895 with continuous fire sub-flame; a new line of ovens, and numerous other special features.

WILLIAM G. BARROWS, 109 Fage avenue, Syracuse, N. Y., has just issued a book that will be of much interest to the heating trade. It is a collection of estimate blanks for warm air heating and was compiled with a view to making the blanks meet the requirements of furnace work. In the book, which measures 10 x 4½ inches, are 50 blanks, each one covering two pages. At the top of the first page are lines for the name and address of the customer; then come memoranda for the number of registers, partition pipes, total cubic feet to be heated, hight of the different stories. Following this in a wide column are lines for entering the price of the registers and borders, 12 spaces being allowed to them. Opposite the different sizes of registers are given the prices. Following is a list for pipe, register boxes, and heads covering 21 lines with prices opposite the goods. The second page continues with register boxes, elbows, boots, collars, dampers, thimbles, &c., and ends with miscellaneous items of labor, setting, board bills, railroad fares, mason work, &c. A double column is provided for the insertion of prices and at the end are lines for the total contract price and the date payable. A book of this sort for reference would be of great service to furnacemen and others.

CHAS. A. STOCKSTROM, president of the Quick Meal Stove Company and Ringen Stove Company, St. Louis, Mo., is off on a month's sojourn in Old Mexico. Mr. Stockstrom is making a distinct pleasure trip and is not associating business with his journey at all. He is making the trip alone, and expects to return to St. Louis about the middle of February.

THE STOCKHOLDERS of the Bloomington Stove Company, Bloomington, Ill., held a meeting Monday afternoon, January 7, the principal object of which was to reorganize under the new law and adopt a new charter, the old one having expired by limitation.

INGLING, MILLS & WELLS of Indianapolis, Ind., have issued an announcement to the trade, to the effect that they have purchased the stock and business of the Famous Stove Company at 135 South Meridian street of the city named, and will continue the wholesale stove business at that place under the same firm name. The trade will doubtless recognize the name of A. E. Wells as a former manager of the Cleveland Co-operative Stove Company and also of S. R. Wells of Indianapolis. The firm request that all orders be addressed to the Famous Stove Company, and all remittances due the Famous Stove Company prior to January 1 to Parkhurst Brothers & Co., Indianapolis, Ind.

THE NEW YEAR'S GREETING issued by Henry Gleason of 106 Beckman street, New York, is unique in its way. It consists of an extract from a trade paper relative to the business of Mr. Gleason during 1894, printed upon coarse brown wrapping paper, folded once and finished with rough edges. This is inclosed in an envelope of the same material, properly addressed and stamped.

DURING the past month agents of the Peninsular Stove Company of Detroit, Mich., have been giving in various parts of the State exhibitions demonstrating the practical merits of Peninsular wrought steel ranges. These displays have been made at Battle Creek, Grand Rapids, Flint, Ann Arbor, Saginaw, Bay City, West Bay City and other places of greater or less importance. In connection with the exhibitions there have been in several cases bread making contests, the prize at Flint being a $50 steel range, given by J. B. Wilson. The contestants were required to bake three loaves of bread and take them to the store of Mr. Wilson, where judges would decide to whom was entitled the prize. A free lunch and concert were given at his store every afternoon and evening, and after the prize had been awarded the bread was distributed to the poor. This contest brought out about 500 loaves of bread, the prize being awarded to Mrs. A. C. McCall. The contest at West Bay City produced about 650 loaves of bread, the range being won by Mrs. W. J. Hawkins. These exhibitions have served to increase the popularity of the company's goods and will doubtless be the means of making large sales.

THE STANDARD LIGHTING COMPANY of Cleveland, Ohio, are distributing a rather novel calendar for the new year in the shape of an easel carrying 12 white cards, upon which in red and black are printed the days of the week and month. These cards are carried in what may be called a pocket, the front of which is open exposing to view the letters and figures of the calendar. At the expiration of a month a card is taken out and placed at the back of the pack, this bringing to view the calendar for the succeeding month. Above and below the opening in the face of the easel, which is finished in imitation of leather, is the following inscription: "Cooking made easy by using the wonderful New Process stove manufactured only by the Standard Lighting Company, Cleveland, Ohio.

EUGENE MUNSELL & Co., 218 Water street, New York, are in the market this season with an extensive line of gasoline stoves. They have about completed a new catalogue of 26 pages, which will be mailed to the trade next week. The early pages are given up to illustrations and descriptions of the Standard Lighting Company's New Process, which proved a good seller with the Eastern agents last season. The Reliable Manhattan junior stoves are shown in various styles; also the company's two and three burner step juniors, which are new lines this season. The balance of the catalogue is devoted to low and high juniors, with lay down safety tanks and giant burners. The company also have a full line of rigid tank juniors which are known as the Junior Manhattan B.

S. T. DICKINSON severed his connection as manager of the Lehigh Stove & Mfg. Company, of Lehighton, Pa., on Saturday, January 12.

THE HIGHLAND FOUNDRY COMPANY of Boston, Mass., were the subject of a very interesting article which appeared in the issue of the Boston *Herald* of January 7. According to this authority the foundry was established in 1836 by George P. Bowers on the site occu-

pied by the present plant at 139 165 Pynchon street, then in the town of Roxbury, but now better known as Boston Highlands. The business continued to increase and a few years later Mr. Bowers associated with him Joseph Pratt, the firm name becoming Bowers & Pratt. In the year 1856 Mr. Bowers retired, and until 1863 the business was conducted under the name of Pratt & Co. In that year, however, C. E. Wentworth and J. H. Wentworth were admitted to partnership and the style of the firm was changed to Pratt & Wentworth, which continued until the organization of the existing company in 1876. The Highland Foundry Company are a Massachusetts corporation, their officers being William H. Towne, president, and Percival W. Elliott, treasurer and manager, who, with Captain Albert Cooper, George W. Elliott and Charles B. Wheelock, comprise the board of directors. In the article above referred to mention is made of the company's leading specialties and to the extensive business which the enterprise and ability of the management have built up.

In a recent issue of the *Sentinel*, published at Milwaukee, Wis., there was presented a short history of the leading industrial establishments in that place, among which is the Milwaukee Gas Stove Company, a young but successful concern, organized March 14, 1891. The establishment now occupies a four-story brick structure, covering an area 40 x 110 feet. The article describes at some length the specialties turned out by the company, and refers to the gratifying business which has been built up.

The Sill Stove Works of Rochester, N. Y., recently made a test trial of their new Sterling range, the results of which are described as follows by a local paper: The fire pot was filled with coal. The coal was then removed and kindling put in and the fire lighted. At exactly seven minutes past 12 o'olock p.m. the first baking, consisting of 16 full-sized loaves of bread dough, was put in the oven. From that time on until one barrel (196 pounds) of flour was baked the trial continued, the last baking being taken out at 17 minutes past 10 o'clock p.m.; 231 extra sized loaves of splendid bread were baked. There was not an ounce of coal used except the charge put in the fire pot before commencing.

Charles Noble & Co., Liberty Stove Works, Philadelphia, Pa., are distributing to their friends a handy little pocket diary and calendar combined. Besides a generous amount of space for recording engagements and memoranda pertaining to each day in the year, there are several pages ruled for the keeping of cash accounts, and others ruled especially for the registration of addresses and other memoranda of special importance. A feature of the diary is the tabulation of statistics in regard to populations of towns and States, and rules and regulations of the domestic postal service. The book is of convenient shape for the vest pocket, is neatly and strongly bound in leather, and unless we except the firm's complimentary card on the front of cover, contains nothing of an advertising character.

Wm. O'Keefe, who has represented the Excelsior Mfg. Company of St. Louis in Northern Missouri for some years past, has concluded to abandon selling Charter Oak stoves and ranges, and has associated himself with the Matuity Savings & Loan Company of St. Louis. As a token of esteem in which Mr. O'Keefe is held by the salesmen and other *attachés* of the Excelsior Mfg. Company, he was presented by them with a handsome gold watch chain, and accompanying it were the good wishes of the entire establishment for his success.

Jackson Evans Mfg. Company, St. Louis, Mo., on account of a steadily increasing business have been compelled to vacate their old quarters at 301 South Commercial street, and have moved to new quarters at 806 North Main street, which building was formerly occupied by Paddock-Hawley Iron Company. The building is 30 x 110 feet, four stories high, with basement. The basement will be utilized for unloading and cutting sheet iron, first floor office and warerooms, second and third floors manufacturing and fourth floor wareroom and japanning department. This company commenced the manufacture of Acme stove pipe elbows in St. Louis some six years ago, and have continued to increase their business yearly.

The Eclipse Stove Company, who were recently organized at Rockford, Ill., and who absorbed what was formerly the Van Wie Company, have occupied their new building and are now in active operation. The plant fronts on Race street, with the foundry on Rock River, which flows in the rear of the establishment. Directly in the rear of the office are the vaults for the storage of patterns, while to the left are the mounting, finishing and tin shops, equipped with all the necessary appliances for the proper conduct of the business. Between the foundry and mounting shop is the crating, storage and shipping department, from which goods can be loaded directly on to the cars, there being a railroad switch running up to the loading platforms. The leading spirit in this enterprise is George D. Roper of Rockford, who states that he has adopted the trade name "Eclipse," because he is determined not only to eclipse his former efforts, but those of his competitors.

The Twin Burner Vapor Stove Company of St. Louis, Mo., have issued their annual catalogue for 1895, within the covers of which illustrations are presented of their leading lines of Twin Burner stoves. Attention is specially invited to their line of Process stoves for which strong claims are made. The catalogue consists of 20 pages, is printed in an ink of bluish tint and carries illustrations of an interesting assortment of specialties. The leading place is given to the Twin Burner Process cabinet, one size of which is new for 1895. The Twin Burner Process is next considered, and is shown with two and three burners with step, and two and three burners without. There are also presented illustrations of Twin Burner high and low juniors, together with directions for taking care of independent burner gasoline stoves. A four-page folder accompanying the catalogue shows the company's new line of high and low junior stoves with stationary tanks.

Charles E Coleman, representing Eugene Munsell & Co., 218 Water street, New York, has been notifying dealers in the territory which he covers that he will call upon them in a few days to take their orders and talk over matters for 1895. The notification is in the shape of an illustrated circular, the address side of which is bright red while the other is white. It is folded in such a way as to be mailable and conceal what is within. The notice states that for the season of 1895 many new features have been added to the already extensive and modern lines of Manhattan ranges and stoves, and that Mr. Coleman feels sure he can interest all upon whom he may call. He requests that dealers withhold their orders until he visits them.

The Michigan Stove Company are issuing this year very artistic advance notices of the coming of their traveling representatives. One now lying before us is a four-page circular of heavy uncalendered paper, which bears on the outside page a striking illustration by Will H. Bradley, the famous pen and ink artist, whose work is now exciting a *furor* in art circles. A deep crimson border brings out the black outlines of the illustration very effectively. The inside pages are printed in antique type, formerly known as "black letter," with the salesman's name in crimson. The company are also circulating beautifully printed and richly illustrated circulars descriptive of the Columbian Garland steel range, which is made in every style and size.

The Western Stove & Mfg. Company of Milwaukee, Wis., have established a Chicago office in charge of T. J. Duffy, Jr., in Rooms 73 and 74 at 88 and 90 Washington street. They have made an excellent selection in their Chicago representative as he is well and favorably known in the local stove trade.

The Joseph Bell Stove & Range Company of Muncie, Ind., and with branch house at Wheeling, W. Va., have favored their friends in the trade with a very attractive calendar for the new year. The heavy piece of white cardboard is embellished with a beautiful reproduction of a picture by C. Schultz entitled "An Old Water Mill in Germany." This occupies fully one-half of the card, below which is advertising matter relative to the company and the goods which they manufacture. At the bottom are the 12 leaves carrying the calendar proper. The printing is in bold black letters and figures upon a white ground and shows in addition to the days of the week and month the various phases of the moon.

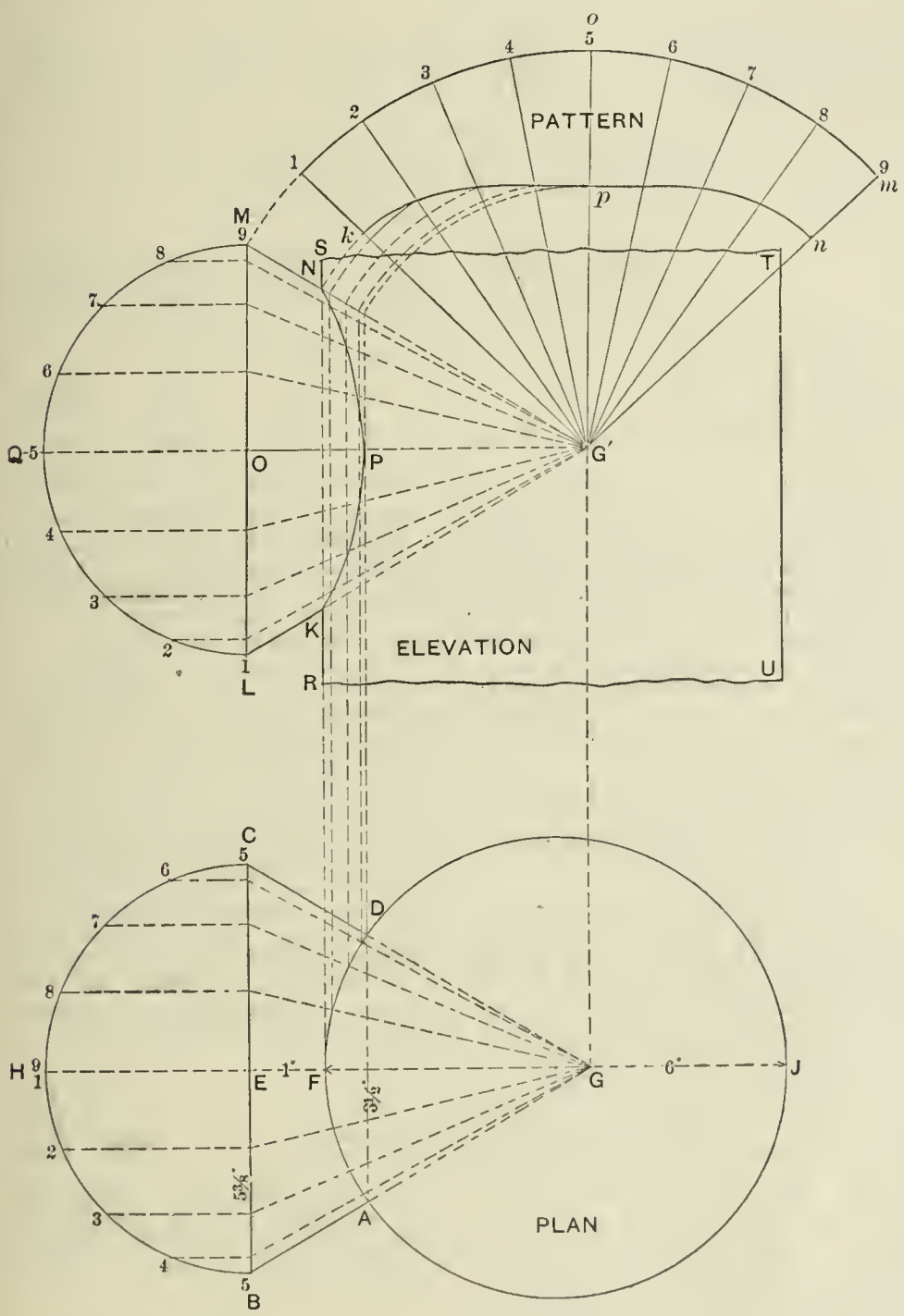
At the annual meeting of the stockholders of the Bellaire Stove Company, Bellaire, Ohio, held on Tuesday, January 15, the old board of officers and directors was re-elected. The officers are: H. Roemer, president and treasurer; J. B. Montgomery, vice-president; E. H. Rider, secretary, and Robert Johnston, manager. The reports presented at the meeting showed that while the company did not make a fortune during the past year the volume of trade was better than generally expected. The demand for the company's goods is encouraging and the new year opens with bright prospects. Ross Reed will represent the company on the road during 1895.

The Aqueduct Commissioners of New York City have gone through the preliminaries for purchasing about 300 acres of land at Jerome Park for a new reservoir. The land will cost about $3,000,000, and it is calculated that the reservoir will cost about $3,500,000. It will hold about 1,500,000,000 gallons of water, or about half as much again as the present large reservoir in Central Park. It is calculated that the work will be completed in about five or six years.

THE TIN SHOP.

Pattern of a Frustum of a Cone Intersecting a Cylinder.

From W. E. W., *Grand Rapids, Mich.*—I have been at work on a pattern for some time, and am unable to describe it correctly. The pattern desired is for a flaring article to join a cylinder. As shown in plan the diameter of cylinder F J is 6 inches. The diameter of frustum of cone is 5⅝ inches at B C, 2½ inches at A D and the projection of E F is 1 inch.



Pattern of a Frustum of a Cone Intersecting a Cylinder.—Fig. 1.—*Plan, Elevation and Pattern.*

Answer.—In the plan, Fig. 1, let A B C D F reprent the section of cone, B C G the cone from which the section is cut, B H C the semicircle representing the half profile of cone at its base and A D J the cylinder. In line with the cylinder in plan draw the elevation, as shown by R S T U. With the T-square placed parallel to the sides of the pipe, carry a line from the point G in plan to any convenient point, as G′ of elevation. At right angles to G G′ draw G′ Q, indefinitely, and extend B C through Q G′, cutting same at O. With O as center, and E C of plan as radius, describe the semicircle L Q M, representing one-half of the profile of cone at the larger end. Divide L Q M into any convenient number of equal parts, as indicated by the small figures. From the points thus obtained carry lines at right angles to L M, cutting that line as indicated. From the points thus obtained in L M carry lines to the apex G′, as indicated by the dotted lines in the engraving. Divide B H C into the same number of equal parts as was L Q M, and from the points thus obtained carry lines at right angles to B C, cutting that line as indicated. From the points thus obtained in B C carry lines to the apex G, cutting the plan of pipe as shown. With the blade of the T-square placed parallel with G G′, and brought successively against the points thus established in the plan of the pipe, cut lines of corresponding number drawn from the points in L M to the apex G′, as indicated from K to N, and extend these lines to M G′. A line traced through these points of intersection, as shown

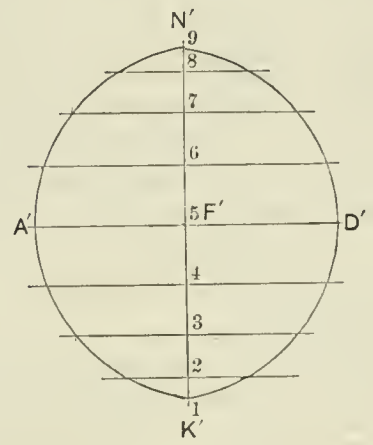


Fig. 2.—*Shape of Opening in Cylinder.*

by K P N, represents the intersection of cone with cylinder in elevation, as shown by A F D in plan.

For the pattern, proceed as follows: From G′ as center, with G′ M′ as radius, describe an arc as indicated by *l o m*, and starting from *l*, step off the stretchout of the half profile L Q M, as indicated by the small figures. If the entire pattern is required in one piece extend the arc *l o m*, and from *m* set off a duplicate of *l o m*. From the points thus obtained draw radial lines to G′, as indicated. Then with G′ as center, and with radii corresponding to the points established in M G′, describe arcs, producing them until they cut lines of corresponding number drawn from G′. A line traced through these points of intersection, as shown by *k p n*, will give the pattern of part of article shown in elevation by L M N P K. For the shape of opening in the cylinder corresponding to the cut A F D of plan, or K P N of elevation, proceed as follows: Draw N′ K′ of Fig.

2, and through the center F′ draw the perpendicular A′ D′. From F′ set off on N′ K′ the length of lines drawn through O P of elevation, intersecting the miter line N P K. Through the points thus obtained in N′ K′ draw lines parallel with A′ D′. Measuring in each instance from the line N′ K′, set off on each side of it the distance from F in plan to lines of corresponding number drawn from C B to G. Through the points thus obtained trace a line, as indicated by A′ N′ D′ K′.

The Resistance to Corrosion of Some Light Aluminum Alloys.*

BY JOSEPH W. RICHARDS, PH.D.

It is well known that pure aluminum is a comparatively soft metal, and that for many mechanical purposes where strength is a prime consideration it is strengthened and hardened by being alloyed with a small proportion of some other metal, such as copper, nickel, silver, German silver, or titanium. While pure aluminum has a tensile strength in castings of 15,000 pounds per square inch, and in sheet of 25,000 pounds, the addition of 5 per cent. of nickel or German silver or 2 per cent. of titanium increases the strength to 20,000–30,000 pounds in castings and 40,000–50,000 pounds in sheet. At the same time as the strength is thus increased from 50 to 100 per cent., the specific gravity is not increased over 5 per cent.; all of these light, strong alloys being lighter than 3. An American firm making aluminum bicycles uses an alloy containing about 8 per cent. of copper and 12 per cent. of zinc, giving them castings of great rigidity.

The object of the tests about to be enumerated was to determine the relative resistance of some of these light alloys to corrosion. The strips of rolled metal were immersed in the following liquids:

1. *Dilute Caustic Potash*, 3 per cent.—The behavior of the alloys in this solution shows their relative resistance to alkali, such as in strong soaps, &c., and shows the suitability of the alloys for laundry purposes. Solution cold.

2. *Dilute Hydrochloric Acid*, 3 per cent.—This is the only acid which attacks aluminum rapidly. Solution cold.

3. *Concentrated Nitric Acid.*—Shows the suitability of the alloys for replacing platinum in the Grove battery. Acid cold.

4. *Strong Acetic Acid.*—Shows the resistance of the alloys against vinegar, and bears directly on the uses of the metal for pickling kettles, &c. Solution at 60° C. = 140° F.

5. *Strong Solution of Common Salt.*—This shows the resistance to the agent present continually in cooking utensils. It also shows light on the suitability of aluminum for the metal cases in which artificial ice is made, a use for which its great heat conductivity would particularly fit it. Solution at 65° C. = 150° F.

6. *Solution of Carbonic Acid Gas*—Aluminum has been suggested for trimmings on soda water fountains and for the metal cups for holding soda water glasses. The action of water charged with CO^2 would also correspond to the action of rain water and in general to exposure out of doors. Solution at 25° C. = 77° F.

Table I.—Relative Resistance to Corrosion (Pure Al = 100).

	Caustic potash.	Hydrochloric acid.	Nitric acid.	Salt.	Acetic acid.	Carbonic acid water.
3 per cent. copper	13.0	10.8	26.2	37	41.2	not corroded
3 per cent. German silver	1.4	4.4	9.8	78	26.0	133.3
3 per cent. nickel	5.9	3.2	11.3	31	20.7	30.8
2 per cent. titanium	47.0	133.3	51.9	63	80.5	not corroded
99 per cent. aluminum	100.0	100.0	100.0	100	100.0	100.0

Table II.—Actual Losses Per Day (in Milligrams per Square Centimeter of Surface).

	Caustic potash.	Hydrochloric acid.	Nitric acid.	Salt.	Acetic acid.	Carbonic acid water.
3 per cent. copper	265.0	53.3	36.1	0.1	0.4	0.0
3 per cent. German silver	1,534.4	130.6	97.7	0.05	0.6	0.01
3 per cent. nickel	580.3	180.0	83.0	0.13	0.75	0.04
2 per cent. titanium	73.4	4.3	18.6	0.06	0.20	0.0
99 per cent. aluminum	34.6	5.8	9.6	0 04	0.15	0.01

Table III.—Time Which Would be Required by the Solution in Eating Through the Walls of a Vessel 1 Mm. (1/25 inch) in Thickness.

	Dilute. potash. Days.	Hrs.	Dilute. hydrochloric acid. Days.	Hrs.	Conc. nitric acid. Days.	Hrs.	Strong. acct. ac. Days.	Strong. salt. Days.	Saturated. carbonic acid water. Days.
3 per cent. copper	1	2	5	7	7	20	705	2,820	. ....
3 per cent. German silver	..	4	2	5	2	22	467	5,600	28,000
3 per cent. nickel	..	12	1	13	3	8	379	2,130	7,000
2 per cent. titanium	3	20	64	..	14	20	1,375	4,550	.....
99.9 per cent. aluminum	7	20	46	22	28	8	1,810	6,800	27,000

Remarks on the Tables.—For bath-tubs, wash basins, laundry tubs, wash boilers, and any use in which the alloys come in contact with alkali, the pure metal resists corrosion far better than any of the alloys examined. At the same time, if greater strength is required, the copper alloy stands next in suitability and possesses the advantage of casting with less shrinkage than pure aluminum.

For purposes where free hydrochloric acid may accidentally be encountered, the titanium alloy recommends itself as far superior to the other alloys, and even to the pure metal.

For use in nitric acid, the pure metal stands first, and it would be a fair conclusion that the purer it is the greater will be its resistance. It would, therefore, be preferable to obtain the very purest aluminum for making battery plates, such as the Pittsburgh Reduction Company's 99.9 per cent. quality. A sheet of such metal $\frac{1}{10}$ inch in thickness would bear over a month constant immersion in the concentrated acid.

In strong acetic acid the alloys all resist well, but the pure aluminum best. If it is necessary to have considerable strength, the titanium alloy is the best. The use of such alloys for steam jacketed kettles in pickle and vinegar works, also for evaporating dishes, &c., in chemical works, is of rapidly growing importance.

In strong salt solution, pure aluminum is best, but the German silver alloy stands highest among the alloys.

Since this alloy is of a fine color, strong and quite elastic, its use would appear advantageous in cooking utensils, but especially for the cans in ice cream freezers and the large rectangular vessels in which artificial ice is frozen. Aluminum stands next to copper and silver in heat conductivity, and its use for the last mentioned purpose would insure a very rapid flow of heat from the contents of the cans, while the innocuity of the metal would be an additional point of superiority over the tin or galvanized iron vessels now used.

For out of door exposure, as shown by the resistance to water charged with carbonic acid, the titanium or copper alloys are to be recommended. They are of about equal strength, but the copper alloy has the best color.

There are numerous purposes to which aluminum can be applied where the general requirements are fine color, strength, springiness and hardness, without particular reference to the action of the above mentioned corroding agents. Such are, for instance, penholders, paper cutters, pocket rules, match boxes, cigar cases, combs, tongs, watch and key chains, field glasses, surveyors' instruments, mariners' sextants, and many others. For all such purposes, the German silver alloy can be recommended as being the best adapted. Its mechanical properties have been determined by the writer, as follows:

	Cast.	Rolled.
Specific gravity	2.73	2.83
	Lbs.	Lbs.
Elastic limit	20,500*	40,000†
Tensile strength	22,450*	42,040†

The color of this alloy is whiter than pure aluminum; it is considerably harder, therefore stands wear better, and in thin sheets is almost as elastic as steel.

The right of way for an electric railway from Merced, Cal., to the Yosemite Valley is reported to have been secured. The power is to be established at three points on the Merced River. The new road will be broad gauge and adapted for both passengers and traffic. A contract for the construction of the line is said to have been taken by the Pacific Improvement Company. The new company is capitalized at $2,500,000.

* Read at the stated meeting of the Chemical Section of the Franklin Institute, held December 18, 1894.

*Test of specimens, prepared by the writer, made on the United States testing machine at Watertown Arsenal.

†Specimens prepared by the writer, rolled hard, tested by Tinius Olsen, Philadelphia.

TRADE REPORT.

The Iron Market.

The prospect of a heavy consumption of rolling mill products is very good. While the big work does not go into the shops for a month or two, recent developments seem to foreshadow a modest recovery in prices by spring. For the present, low prices continue to prevail all along the line on all material for prompt delivery.

Pig Iron.—The market in New York continues quiet, although a fair movement is progressing. So far as can be learned the advance in rates on Pig Iron from Southern furnaces of 25¢ ℔ ton is in force. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

There is a slightly improved demand reported from the Philadelphia market and prices of Foundry and Mill Irons are, if anything, steadier than they were a week ago. Quotations vary according to circumstances, but $10.25 may be considered a bottom figure for No. 3 Iron, $10.75 for No. 2 Plain, $11.25 for No. 2 X, and $12.25 for No. 1 X. Standard and favorite brands command more money, probably $11.75 for No. 2 X and from $12.50 for No. 1 to 50¢ above that figure, according to quality required. The demand is fair, but the supply is larger than it has been, in consequence of which the outlook in regard to prices is somewhat uncertain. Sales are usually at about the figures quoted below, namely:

Standard No. 1 Foundry X	$12 25	@	$12.75
Standard No. 2 Foundry X	11.50	@	11.75
No. 2 Plain	10.75	@	11.00
No. 1 Soft	11.50	@	11.75
No. 2 Soft	10.75	@	11.00

The only item of importance reported from the Chicago Pig Iron market is the statement that the freight on Connellsville Coke is expected to be reduced about 10¢ ℔ ton on February 1. Sales of Pig Iron have been small and inquiries are light, but shipments from local furnaces are quite heavy, as the local companies are well fixed for orders. Southern iron is reported to be in better demand since prices have been modified, so that they are now more nearly on an equality with prices of Northern brands of the same grade. Lake Superior Charcoal is quiet, the sales of the week being confined to small quantities. Quotations are as follows, for cash:

Lake Superior Charcoal	$13.00	@	$14.00
Local Coke Foundry, No. 1	10.25	@	10.50
Local Coke Foundry, No. 2	9.75	@	10.00
Local Coke Foundry No. 3	9.50	@	9.75
Local Scotch	10.50	@	11.00
Ohio Strong Softeners No. 1	12.50	@	13.00
Southern Silvery, No. 1	11.50	@	11.75
Southern Silvery, No. 2	11.25	@	11.50
Southern Coke, No. 2	10.00	@	10.50
Southern Coke, No. 3	9.75	@	10.25
Southern, No. 1, Soft	10.00	@	10.50
Southern, No. 2, Soft	9.75	@	10.25

There is no improvement in either demand or prices to be noted in the Pittsburgh district for foundry Irons. The lower quotations given herewith are occasionally shaded for desirable orders. Quotations are given as follows:

No. 1 Foundry	$10.50	@	$10.65 Cash
No. 2 Foundry	10.00	@	10.25 "

Pipe works have continued the largest melters of Pig Iron in the Cincinnati district for the past few weeks, and further sales of Pig Iron aggregating about 4000 tons have been recorded during the week under review. With this exception the sales have been confined to small amounts, although the aggregate transactions form a very fair volume of business for this season. While large transactions have been the exception rather than the rule, the demand for small lots has been more general and extended, and for prompt delivery there has been little change in the tenor of the market. Large Southern companies have continued to hold firmly at full prices. Others have refused to shade established prices. Smaller companies, however, have continued to take current orders offered on a basis of inside quotations. Quotations are given as follows:

Southern Coke, No. 1	$9.75	@	$10.00
Southern Coke, No. 2	9.00	@	9.25
Southern Coke, No. 3	8.50	@	8.75
Ohio Soft Stone Coal, No. 1	14.50	@	15.00
Ohio Soft Stone Coal, No. 2	14.00	@	14.50
Lake Superior Coke, No. 1	11.75	@	12.25
Lake Superior Coke, No. 2	10.75	@	11.50
Hanging Rock Charcoal, No. 1	16.00	@	16.50
Hanging Rock Charcoal, No. 2	15.50	@	16.00
Tennessee Charcoal, No. 1	13.00	@	13.50
Tennessee Charcoal, No. 2	12.00	@	12.50
Bessemer	11.65	@	12.00
Standard Southern Car Wheel	15.75	@	16.75
Lake Superior Car Wheel and Malleable	14.25	@	14.75

The St. Louis market fails to show any material change. Orders do not average over 100 or 200 ton lots, although some manufacturers are reported to be at present figuring on much larger quantities. The furnaces are shipping considerable quantities of Iron on old contracts, so that their stocks do not show any material increase. The situation is not nearly so discouraging as it was two months since, and the improvement, though slight, is a welcome one. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.50	@	$10.75
Southern Coke, No. 2 Foundry	9.75	@	10.00
Southern Coke, No. 3 Foundry	9.25	@	9.50

Metal Market.

Pig Tin.—In the earlier portion of the week wholesale prices declined to the extent of about ¼¢ ℔ lb. The downward movement was an almost unbroken one for several days, and indications suggested that it was engineered by leading "bears" in London, who are sparing no efforts to force the syndicate to throw off its heavy load. Their action has been materially aided by the weight of heavy supplies. Later in the week the market assumed a firmer aspect, owing to a sharp advance in London, due to reports of light December shipments from the Straits. The jobbing demand has been moderate, and prices for small lots from store are rather easier, 15¢ ℔ lb being the ruling quotation for Straits Pig.

Copper.—Considerable business has been done and the market retains a firm tone throughout. Offerings are moderate and prices keep very steady. The export movement also has been large enough of late to absorb a substantial amount of the metal. Inquiry and small orders among the jobbing houses have been somewhat larger. Prices for small parcels of Lake Ingot are made on a basis of about 10¾¢ ℔ lb. The exports of Copper from the United States during November and the 11 months ending November 30 are specified as follows in the report of the Bureau of Statistics:

Ore.	November. 1894. Tons.	November. 1893. Tons.	11 Months. 1894. Tons.	11 Months. 1893. Tons.
To United Kingdom	184	2,011	1,854	40,407
To Germany	....	....	1	1,043
To other countries	...	....	.....	. ...
Totals	184	2,011	1,855	41,450

Ingots, bars and old.	November. 1894. Pounds.	November. 1893. Pounds.
To United Kingdom	3,807,555	5,715,564
To Germany	700,641	1,681,969
To France	1,257,704	3,103,435
To other Europe	2,826,876	7,036,713
To Br. No. America	30,630	161,640
To Mexico	11,357	.....
To West Indies and Bermuda	.....	3,400
To other countries	. ...	10,000
Totals	8,634,763	17,712,721

Ingots, bars and old	Eleven months. 1894. Pounds.	Eleven months. 1893. Pounds.
To United Kingdom	62,176,894	33,636,042
To Germany	19,714,385	15,796,167
To France	17,506,383	25,259,573
To other Europe	50,059,520	44,186,789
To British North America	285,162	578,937
To Mexico	198,080	85,507
To West Indies and Bermuda	7,481	15,704
To other countries	6,208	43,600
Totals	149,954,113	119,602,319

Sheet Copper.—Rather more interest in Cornice Copper is noted and inquiry has increased in volume. Orders are, however, still on a moderate scale and little or no material is being purchased by consumers for stock. Prices for small lots from store are firm on a net basis of 15¢ ℔ lb.

Pig Lead.—Early in the week a lively market was experienced and some 1500 tons or more changed hands, wholesale prices for common Western being carried up ⅛¢ ℔ lb, owing to the shutdown of Idaho mines and consequent reserved offerings. The market closed very firm in tone. The consumptive demand has been fairly active. Jobbing prices for American Pig rule at 3⅜¢ @ 3½¢ ℔ lb. Bar Lead, in small lots, is quoted at 4¢ @ 4⅛¢.

Lead Pipe and Sheet.—Consumers of manufactured Lead and plumbers' supplies have shown rather more interest in buying during the week. Jobbing houses in this city report considerable energy, but no very material improvement in the demand is looked for before the early spring. Prices in this section are generally held firmly to the list.

Spelter.—In the market for this metal the situation is practically the same as it has been for several weeks.

Transactions here continue to be on a moderate scale, the demand does not increase perceptibly, and the moderate business passing is chiefly at old prices. Western in small lots is quoted at 4¢ @ 4¼¢, with the inside figure for inferior brands.

Antimony.—The jobbing movement continues fair. Prices remain at about 8¢ for Hallett's and 9¼¢ for Cookson's.

Nickel.—We quote at 37¢ @ 42¢, according to size of lot, &c.

Tin Plate.—The event of the week has been the announcement that the wages dispute in the West has been settled, the Tin Plate workers accepting a reduction ranging from 12½ % to 15 %. This will lead to a renewal of activity among the domestic works. The market, as a whole, remains in a condition of irregularity, although some improvement in inquiry is noted among the jobbing houses. Small orders have been rather larger in their aggregate volume, but the amount of business doing still lays behind the average for the season. The outlook is not regarded as presenting any features of special encouragement. Canners of most varieties of vegetables have had such poor return from their enormous packs of last year that they intend to curtail operations the coming season, and are, therefore, very indifferent buyers of Coke Plates. Fruit canners are in not much better shape, and meat canners are not enjoying enviable experience. Competition is keen and keeps prices low and irregular.

A special London cable dispatch of January 16 to *The Iron Age* reports on the British Tin Plate market as follows: Tin Plate is without change for the better. Prices for Cokes are three half-pence lower. Business at the quarterly meetings was limited mostly to small lots. Reports went to show that the outlook is without improvement. Makers depend mostly on early reduction in workmen's wages to give relief. Present values do not remunerate. Buyers admit that prices are too low, but take no advantage of the cheap rates. One of the makers proposes raising prices by combine. Non-associated makers thought this not practicable, owing to possibility of increasing American competition. The large Eastern demand for Wasters continues. The quotations, f.o.b. Swansea, are as follows:

Bessemer Cokes, IC 14 x 20.	... @ 9/4½
Siemens Cokes, IC 14 x 20.....	9/7½ @ 9/10½
J. B. Steel Cokes, IC 14 x 20 ...	....
Ternes, 20 x 28.....	18/6 @ 21/
Charcoals, IC 14 x 20.....	10/6 @ 12/6

Chicago Report.

Scrap. — Business continues quiet. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap.....	$7.00	....
Machinery Cast.....	6.00	....
Malleable Cast.....	5.50	....
Stove Plate (free of burnt)...	4.25	....
Burnt Iron and Grate Bars..	3.00	....
Sheet Iron and Hoops.....	2.00	....
Plow Steel and Breaking Stock.....	4.00	....
No. 2, such as Shovels, Hoes, &c.....	3.00	....
Old Boilers—whole (Iron)....	3.00	....
" (Iron)—cut in single Sheets and Rings..	5.00	....
Old Gas-Pipe and Boiler Tubes.....	5.00	....
Cast Borings.....	3.00	....
Turnings.....	4.00	....
Horseshoes.....	7.50	....
Copper Bottoms.....	....	6 ¢
Copper Clips and Heavy.....	....	7 ¢
Heavy Brass.....	....	6 ¢
Light Brass.....	....	3 ¢
Pipe Lead.....	....	2½¢
Tea Lead.....	....	2 ¢
Zinc.....	....	2¼¢
Rubber.....	....	4½¢

Anthracite.—Very little business is reported by dealers and prices are not firmly maintained. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill.....	$4.75	$5.00
Milwaukee, Wis.....	4.75	5.00
Kansas City, Mo.....	7.95	8.20
Council Bluffs, Iowa.....	7.95	8.20
Lincoln, Neb.....	8 10	8.35
Sioux City, Iowa.....	7.95	8.20
Aberdeen, S. Dak.....	8.00	8.25
Dubuque, Iowa.....	6.05	6.30
Madison, Wis.....	6.25	6.50
St. Paul, Minn.....	7.25	7.50
Burlington, Iowa.....	6.25	6.50
Des Moines, Iowa.....	7.75	7.95
Davenport, Iowa.....	6.05	6.30
St. Joseph, Mo....	7.95	8.20
Leavenworth, Kan.....	7.95	8.20
Omaha, Neb.....	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver.....	$8.00
Pueblo.....	8.00
Colorado Springs.....	8.00
Leadville.....	8.00
Cheyenne, Wyo.....	10.00
All points between Denver and Missouri River.....	8.85

CONDITION OF THE

Hardware Trade.

DURING the past week a good many travelers have gone out in the interests of their houses, but it is as yet too early to hear from them to any great extent in the way of orders. Others will be entering the field during the next week or two, and under the stimulus of the efforts thus put forth there will undoubtedly be an increase in the volume of business. Some orders are now being received from jobbers and retailers, however, to complete their assortments, and there is a perceptible increase in the demand. These orders, with scarcely an exception, indicate that stocks are exceptionally light and in some cases broken. The trade, however, are buying carefully and are not at all disposed to speculate. The present month is one when a good many changes in discounts and lists are expected, but this year they were perhaps less than usual. Prices on Hardware generally are rather irregular and the tone of the market is not strong. It is, however, expected that there will be a good volume of business during the season, and the condition on the whole is referred to as showing continued, though not very rapid, improvement, which has characterized the market for some time.

Advices from Chicago.— The Shelf Hardware trade has opened up very satisfactorily with those houses whose salesmen are now out on the road. A few jobbers kept their men in a little later, and consequently have not yet begun to thoroughly feel the pulse of the trade. Country merchants, so far as they have been seen, appear to be in the humor now to stock up to some extent, and their orders are much better than at the beginning of last year. The demand covers all kinds of goods in straight Hardware, as well as staples. The situation is a little clouded, however, by the efforts of some local jobbers to move their staple goods a little faster by making especially low prices. Coming at this time the weakening in staple goods may have the effect of causing buyers to hold off to see if the bottom of the market has been reached. Tinware and House Furnishing Goods are in particularly excellent demand. Orders are larger than for a long time and buyers are urgently requesting goods to be shipped promptly. The heavy Hardware trade has also opened up nicely and orders now coming in are well assorted. Collections are fair.

Notes on Prices.

Wire Nails.—There has been little change in the condition of the Wire Nail market during the past week. There is, however, increased inquiry and more orders have been placed, the volume of business being fair. There is little disposition on the part of the trade to purchase in a speculative way, although the prices ruling are conceded to be low. Small lots from store in New York are held at $1.15.

Advices from Chicago.—Manufacturers report a considerable improvement in the inquiry and a very much better run of actual orders. The trade in districts outside of Chicago appears to be considerably larger than in this immediate vicinity. The jobbing trade has been considerably disturbed by the low prices made by one large house for private reasons. The usual jobbing quotation for carloads is $1, f.o.b. cars Joliet, or $1.05 for small quantities, but the house referred to has put this rate down to manufacturers' lowest prices for large lots.

Cut Nails.—The Cut Nail Market is quiet, though there is some increase in the volume of business. Prices are unchanged. Small lots from store at New York are held at 90 to 95 cents.

Advices from Chicago.—This trade is moving along in about the same fashion as previously reported. Orders are coming in moderately well, being usually confined to carload lots. Prices are unchanged at $1 for small lots from stock.

Barb Wire.—The manufacturers of Barb Wire report some increase in the volume of business since the opening of the year, but trade on the whole is quiet. Prices are without change, but the tone of the market is not especially strong. Concessions which have recently been made are still being offered, and there are rumors of some sales at low figures. The market is represented by the quotation of $1.80 to $1.85 for Four Point Galvanized, in carload lots at mill.

Advices from Chicago. — Manufacturers' orders, so far as can be learned, have been of a moderate character only during the week and prices are running the same as previously. The standard makes of Barb Wire appear to be completely unaffected by the low prices made by one concern, which has had occasional notice in these reports. Jobbers are making regular quotations of $1.60, f.o.b. cars Joliet, for carloads of Painted, and $1.95 for Galvanized, but a large local jobbing house has introduced the same policy in the Barb Wire trade as above referred to in the Wire Nail trade, and is making a cut to actual manufacturers' prices.

Skate Sharpener.—The Skate Sharpener illustrated in our last issue as put on the market by Banker & White, George M. Matteson, agent, 111 Duane street, New York, is sold to the trade at $1.75 per dozen and $18 per gross.

Can Opener and Cover.—The Eclipse Can Opener and Cover, made by the Brooklyn Novelty Company, 1055 Madi-

son street, Brooklyn, N. Y., of which an illustrated description was given in our issue of January 12, is designed to retail for 10 cents each and is sold to jobbers at $7.50 per gross. The manufacturers state that with care the opener and cover will last an almost indefinite time.

Binder Twine.—The Binder Twine market is characterized by a lack of activity. Buyers as a rule are holding off, although a good many orders have been placed. Manufacturers of twine outside the Trust are not, as a rule, pushing the manufacture or sale of their product, but are rather awaiting the results of the marketing, by the Western Twine Company, of the several thousand tons of Binder Twine which has been held by bankers as collateral, and which was not disposed of last season. Some of those familiar with Binder Twine express doubts as to the value of held-over Twine in comparison with that of this year's make. The market is in an unsettled condition regarding prices, and quotations from the representatives of various factories show quite a range for the same class of goods. The market is represented by the following quotations, the extremes, as a rule, indicating the difference in cost between car lots and less than car lots; in some cases, however, the lowest and highest prices are made for the same quantity of twine by different manufacturers:

Sisal, 5 to 5½ cents per pound.
Standard, 5½ to 6½ cents per pound.
Manila, 6 to 6½ cents per pound.
Pure Manila, 7 to 7½ cents per pound.

Manufacturers agree that there is little or no money in making and selling Twine at present prices, and prefer to utilize their plants for the manufacture of rope. This feeling is so pronounced that one factory proposes working their Twine up into rope, rather than market it at lower prices than those ruling. Any advance or decline in the price of raw material will affect the price of Binder Twine, as the prices for the finished product are based upon the cost of fiber.

Eave Troughs.—We present below the revised price-list adopted at the first regular meeting of the United States Eave Trough and Conductor Pipe Association, held at Cincinnati, January 9:

Galvanized Lap Joint Eave Trough.

No.			Per foot.
3	6-inch	girt	$0.13
3½	7	"	.14
4	8	"	.16
5	10	"	.19
6	12	"	.23
7	14	"	.27
8	16	"	.30

Slip Joint, 1 cent per foot higher than Lap Joint.

Double Bead, 3 cents per foot extra and must have 2 inches more girt.

For heavier than No. 28 gauge add following: Nos. 27, 1 cent; 26, 2 cents; 24, 4 cents; 22, 10 cents; 20, 18 cents.

Tin Eave Trough.

No.			IC Terne. Per foot.	IX Terne. Per foot.
3	6-inch	girt	$0.08	$0.09
3½	7	"	.09	.10
4	8	"	.10	.11
5	10	"	.12	.13
6	12	"	.14	.15
7	14	"	.16	.17
8	16	"	.19	.20

Slip Joint, 1 cent per foot extra.

No change in list price on Conductor Pipes and Eave Trough Miters.

Wringers.—The following are the prices of the National Wringer & Mfg. Company, Canton, Ohio, on the line of Wringers which they are putting on the market. Terms 60 days, 2 per cent discount for cash in ten days:

	Per dozen.
No. 20, Erie, 10-inch	$22.50
No. 30, " 11 "	25 00
No. 55, King, 11 "	27.00
No. 2, "77," 10 "	13.75
No. 2, Zenith, 10 "	14.00
No. 3, " 11 "	18.00
No. 4, " 12 "	21.00
No. 40, Prime, 10 "	16 75
No. 50, " 11 "	19.00
No. 66, Columbia, 11 x 1¾ inches	26.10
No. 99, Pittsburgh, 11 x 2 inches	29.00
No. 45, King, 10-inch	24.50
No. 65, " 11 x 2 inches	32.00

The company quote their Daisy Rat Trap at $8.50 per gross.

Stove Bolts.—The market for Stove Bolts has for some time been somewhat irregular, and at a meeting of the manufacturers last week a reduction of 10 per cent. was made in the price. The quotation on these goods is now 70 and 10 per cent. discount.

Tinware.—There are some indications of an understanding between the manufacturers of Tinware, as there is more uniformity in prices, some of them quoting substantially the same figures. The market in this line is deserving the careful attention of the trade, as it is regarded as not unlikely that prices may be somewhat higher, and already it is intimated that some extreme quotations have been withdrawn.

Double Pointed Tacks.—The manufacturers of Double Pointed Tacks have recently been conferring, and as a result the market has a better tone, with a slight advance in prices.

White Lead.—The market is in somewhat uncertain shape and disturbed more or less by foreign competition, present and prospective. There is also some difference of opinion regarding the attitude of home producing interests that tends to complicate matters more or less. Naturally, large buyers proceed slowly in the matter of placing orders and the smaller trade buy moderately, as usual at this season of the year. List prices remain unchanged, and terms are also as they have been for some time past. There are rumors, however, of "cut rates" in some sections and of very low quotations on certain of the better class of mixed Lead.

Old Metals.—Business is quiet and prices somewhat irregular, depending largely on actual requirements and the desire of holders to sell. The following quotations represent the current rates paid by dealers in this city:

Heavy Copper	℔	7 ¢
Light and Tinned Copper	℔	6½¢
Heavy Brass	℔	4¾¢
Light Brass	℔	3¾¢
Lead	℔	2¾¢
Tea Lead	℔	2½¢
Zinc	℔	2⅛¢
No. 1 Pewter	℔	10 ¢
No. 2 Pewter	℔	5½¢
Wrought Scrap Iron,	℔	gross ton $7.50 @ $8.00
Heavy Cast Scrap	℔	gross ton 7.50 @ 8.50
Stove Plate Scrap	℔	gross ton 5.00
Burnt Iron	℔	gross ton 3.00

Old Rags, Paper, &c.—Demand is fair and dealers' purchasing prices substantially the same as those quoted last week, namely:

No 1 White Rags	℔	3 @ 3¼¢
No. 2 White Rags	℔	2¼ @ 2½¢
Mixed Rags	℔	¾ @ 1 ¢
Blues and 3ds	℔	1⅛ @ 1⅜¢
Hard Sized White Shavings	℔	2⅛ @ 2¼¢
No. 1 White Book Shavings	℔	1¾ @ 2⅛¢
No. 2 White Book Shavings	℔	1 @ 1⅛¢
Light Book Shavings	℔	⅝¢
No. 1 Mixed Shavings	℔	¾ @ 1 ¢
No. 2 Mixed Shavings	℔	⅝ @ ¾¢
No. 1 Printed Books	℔	1 @ 1¼¢
Ordinary Mixed Books	℔	½ @ ¾¢
Newspapers	℔	2-5¢
No. 1 Manila Paper	℔	¾ @ 1 ¢
No. 2 Manila Paper	℔	⅝ @ ¾¢
Bogus Paper	℔	½¢
Common Paper	℔	¼ @ 3-5¢
Straw Chips	℔	⅜¢
Binders' Clippings	℔	½¢
Jute Butts	℔	1½ @ 1¾¢
No. 1 Jute Bagging	℔	1 @ 1¼¢
Mixed Bagging	℔	¾ @ 1 ¢
No. 2 Bagging	℔	½ @ ⅝¢
Hemp Twine	℔	2 @ 2¼¢
Manila Rope	℔	2 @ 2¼¢
Jute Rope	℔	1½ @ 1¾¢
Mixed Rope	℔	¾ @ ⅞¢

Old Rubber.—Business has eased off somewhat, and prices are rather weaker. The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots, ℔	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory, ℔	@ .05¼
Rubber Shoes, less than carloads, ℔	@ .04¾
White Wringer Rolls, ℔	@ .03⅞
White Syringes, ℔	@ .03⅞

CONTENTS.

	PAGE
Editorials:	
Accuracy	33
Haste and Waste	33
A Pompeian Bathroom	33
Another Gasoline Field	33
News and Notes	33
The Letter Box—	
Squaring the Circle	34
Pattern for Fluted Cone	34
Weight of Air	34
Condensation Under Iron Roof	34
Flux for Soldering Zinc	35
Wanted, Show Window Suggestions	35
Prentiss Improved Pipe Vise. Illus	35
The Odorless Steel Sanitary Dump Cart. Illustrated	35
Plumbing and Gas Fitting—	
Newark, N. J., Plumbers	36
Master Plumbers and Knights of Tabasco	36, 40
Modern Plumbing Regulations	36
Columbia Wiping Cloth. Illustrated	36
Wisconsin Plumbers	36
Scranton Plumbers Organize	37
Handy Pocket Torch. Illustrated	37
Benefits from Organization	37
Traps and Vents	38
Connecticut's Proposed Plumbing Law	39
Secretary Murray's Report	40
Heating and Plumbing—New Work and Contracts	40
Steam and Hot Water—	
Programme of the American Society of Heating and Ventilating Engineers	41
The Columbia Pipe Hanger. Illus	41
The Heating of Greenhouses by Gas	41
Radiator Screen. Illustrated	42
Heating Notes	43
Isaac A. Sheppard & Co.'s Exhibit	43
The Retail Store—	
Poetry in Trade	44
Steam Sterilizer. Illustrated	44
Gasoline Goods	44
Dietz Crystal Lantern. Illustrated	44
Memoranda	45
Showcase Refrigerators. Illustrated	45
Roofing and Cornice—	
Ceiling Panel Plate with Enriched Center. Illustrated	46
Flashings	46
A Specimen of Fine Copper Work. Ill.	47
Tin Plates—	
The Tin Plate Wages Dispute	48
British Tin Plates in 1894	48
Scrap	48
Trade Notes	49
Stove Trade Notes—	
The Local Stove Trade	50
California Stoves	50
Odd Plates	51
The Tin Shop—	
Pattern of a Frustum of a Cone Intersecting a Cylinder. Illustrated	53
The Resistance to Corrosion of Some Light Aluminum Alloys	54
Trade Report—	
The Iron Market	55
Metal Market	55
Chicago Report	56
Condition of the Hardware Trade	56
Notes on Prices	56
Metal and Miscellaneous Prices	58
Labor Exchange—	
Help Wanted	60
Situations Wanted	60

Metal and Miscellaneous Prices.

CHICAGO, JANUARY 17, 1895.

Tin—

Straits pigs.....16¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX, 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX. 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 25.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade.	IC, 10 x 14	@ 5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—	IC. 10x14.14x20.	$4.75 @ 5.00
	IC, 14x20.90 lb.	4.25 @ 4.50
	IC, 14x20. 100 lb.	4.50 @ 4.75
	10 x 20	@ 7.25
	20 x 28	@10.00
	X, 10x14, 14 x 20	@ 6.25
B.V. Grade.	IC,10x14, 14x20	@ ....

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	IC. 14 x 20	@$5.00
	20 x 28	$9.50@10.00
	IX. 20 x 28	12.00@12.50
Worcester Brand and equal.—	IC. 14 x 20	@ 5.25
	IC, 20 x 28	10.00 @10.50
	IX, 14 x 20	6.25 @ 6.50
	20 x 28	12.50 @13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56		$12.50
XX, 14 x 56	$29.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.37½
IX, 10 x 14, 12 x 12, 14 x 20. 6.62½

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.75
IX, 10 x 14, 12 x 12, 14 x 20. 7.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.25
IX, 10 x 14, 12 x 12. 14 x 20.. 8.00

Usual extra for other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20.....$5.75
IX, full weight, 14 x 20..... 7.50

Irondale A A:

IC, full weight, 14 x 20..... 5.25
IX, full weight, 14 x 20..... 6.75

Irondale A:

IC, full weight, 14 x 20..... 5.00

Irondale B:

IC, 100 lbs , 14 x 20 ..... 4.75
IC, full weight, 14 x 20..... 4.85

Irondale C, IC, 14 x 20, 100 lbs..... 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates.—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $5.00
Old Hundred, IC, 14 x 20, 100 lbs.... 4.75
R. W. & B., IC, 20 x 28, 216 lbs.....10 00
Old Hundred, IC, 20 x 28, 200 lbs.... 9.50

Roofing Plates.

Palm, IC, 20 x 28.....@$10.00
Palm, IX, 20 x 28..... @ 12.25
Empire, IC, 20 x 28.....@ 10.75
Empire, IX, 20 x 28.....@ ....
Hickory, IC, 20 x 28.....@ 11.50
" IX, 20 x 28.....@ 14.10
Alaska (heavily coated), IC, 20x28@ 13.50
Alaska IX, 20 x 28.....@ 16.70
Special, IC, 20 x 28.....@ 13.50
" IX, 20 x 28.....@ 16.50
Niagara, IC, 20 x 28 ..... 9.50
Iroquois, IC, 20 x 28..... 9.00

Westmoreland:

IC, 14 x 20 ..... 5.12½
IC, 20 x 28..... 10.25

Kenwood:

IC, 20 x 28..... 10.00

Furmston:

IC, 20 x 28..... 9.75
Irondale AA, IC, 14 x 20..... ....
Irondale A, IC, 20 x 28..... 10.50
Irondale B, IC, 20 x 28..... 10.10
Each extra cross $1.50.
Challenge, IC, 20 x 28.....10.50

Juno:

IC, 14 x 20..... ....
IC, 20 x 28..... ....

Illinois, Old Method:

IC. 20 x 28 ..... 13.50
IX, 20 x 28..... 16.50

E. L.:

IC, 20 x 28 ..... 10.75
IX, 20 x 28 ..... 13.25

Jessie:

IC, 20 x 28..... 10.25

Old Process:

IC, 14 x 20..... 8.00
IX, 14 x 20..... 9.50
IC, 20 x 28..... 16.00
IX, 20 x 28..... 19.00

H. B. L., Old Style:

IC, 14 x 20..... 7.00
IX, 14 x 20..... 8.25
IC, 20 x 28..... 14.00
IX, 20 x 28..... 16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.65

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 1-10¢	2 8-10¢
17 to 20	₩ lb 2 2-10¢	2 9-10¢
21 to 24	₩ lb 2 3-10¢	3 ¢
25 and 26	₩ lb 2 4-10¢	3 1-10¢
27	₩ lb 2 5-10¢	3 2-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Junlata, or first quality.....dis.75&10%

Copper—

Ingot.

Lake.....11 ¢ @ 11½¢
Casting Brands.....10 ¢ @ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch..... .....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch ..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .48
Plain, ¼ inch up to 5-16 inch ..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... .....4¢

Sheet Zinc—

600 lb casks..... .....$4.75
300 lb casks,..... 4.95
Loose sheets..... 5.05

Solder—

½&½..... 10½@11½¢
Extra Wiping..... 9¼@10½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9¼¢

Lead—

Soft Pig Lead.....3½¢
Bar.....4¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe

1¼ and under, Plain.....57½&10&10%
1¼ and under, Galv..... ....50&10&10%
1½ and over, Plain..... 67½&10&10%
1½ and over, Galv..... 57½%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd.....65%
Ritchie's Spiral Lock Seam, Galv'd.....60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated..... 65%

Elbows—

Adjustable..... .....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list..... 50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz..... .....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....₩ lb, 2 ¢
" " Brown.....₩ lb, 1½¢
" " Purple.....₩ lb, 2½¢
" Ground in oil, B. Red ₩ lb, 6½¢
" Ground in oil, Red..₩ lb, 6½¢
" Ground in oil, Brown ₩ lb, 5½¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Boiled, in oils.....60¢
Linseed Oil, Raw, in bbls .....58¢
Mineral Paints..... 2@4¢
Orange Mineral..... 8¢
Pure White Lead in Oil.....5½@5¾¢
Dry White Lead in bbls.....4¾@5¼¢
Red Lead, American.....5¼@5¾¢
Red Venetian, English, dry .....1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs.....7½¢
Sipe's Japan Oil, in bbls. ₩ gal..... 34¢
Spirits Turpentine, in bbls., ₩ gal@34½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.50
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.15
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.50
Roofing Pitch, lb bbl. of 300 lb.....$3.00

NEW YORK, JANUARY 18, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots.....₩ lb, 63¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ lb, 60¢
100-lb lots.....₩ lb, 55¢
Ton lots.....₩ lb, 53¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ lb, 55¢
100-lb lots.....₩ lb, 53¢
Ton lots.....₩ lb, 50¢

Antimony—

Cookson.....₩ lb, 9¼@9½¢
Hallett's.....₩ lb, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ft.
¼-in. up to 2-in	$0.35
⅛-in. up to ¾-in	.36
¼-in. up to ⅝-in	.38
⅜-in. up to ½-in	.41
5-16-in. up to ⅜-in	.48
¼-in. up to 5-16-in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 19, inclusive,	.28

25 @ 30%

Copper and Bronze Tubing—

3¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square.*
Galvanized..... .....60&10%
Galvanized, Locked Joints.....60&10%
Tin.....60&10%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*19¢ ₩ lb, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10¼¢
Ansonia Grade Casting.....9¾¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Jan. 9, 1895:

Galvanized Lap Joint.

		per foot,	
No. 3	6 in		13¢
No. 3½	7 in	"	14¢
No. 4	8 in	"	16¢
No. 5	10 in	"	19¢
No. 6	12 in	"	23¢
No. 7	14 in	"	27¢
No. 8	16 in	"	30¢

Galvanized Slip Joint.

1¢ per foot higher than Lap Joint.

Terne Lap Joint.

		per foot,	IC	IX
No. 3	6 in		8	9¢
No. 3½	7 in	"	9	10¢
No. 4	8 in	"	10	11¢
No. 5	10 in	"	12	13¢
No. 6	12 in	"	14	15¢
No. 7	14 in	"	16	17¢
No. 8	16 in	"	19	20¢

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized..... .....35%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.	
No. 1..	$0.70	.77	.82	.87	1.05	per doz.
No. 2..	.61	.66	.71	.74	....	"

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized..... ... .35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16....	₩ lb 2.25... ..	2.60¢
Nos. 17 to 21	₩ lb. 2.35.....	2.70¢
Nos. 22 to 24....	₩ lb, 2.45.....	2.80¢
Nos. 25 and 26..	₩ lb. 2.55.....	2.90¢
No. 27.....	₩ lb. 2.65.....	3.00¢
No. 28.....	₩ lb, 2.75.....	3.10¢
American B. B.	₩ lb,	4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11@11½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		75&5@75&10% off.
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig.....3⅜@3½¢
Bar.....4@4½¢
Pipe.....5½¢ 20%
Tin Lined Pipe.....12½¢ 20%
Block Tin Pipe.....80¢ 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled..... .....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's. 100@500 lb.....5¾
Lead, Amn. White, in oil..... .. @ 5½
Lead, Red, bbls. and ½ bbls... .. @ 5¾
Lead, Red, kegs..... .. @ 5¾
Ocher, American..... .. @ 1½
Red Venetian, American..... .. @ 1¾
Linseed Oil:
Raw, ₩ gal..... .. @ .56
Boiled..... .. @ .59
Spirits Turpentine:
In bbls..... .. @ .30
Putty:
In barrels and ½ bbls..... .01½ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01¾ @ .02¼
In bladders..... .01¾ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ lb..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe, " " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra.	4¼¢	38½¢
Rock Wool, ordinary	2¼¢	27¢
Rock Wool, extra	7¼¢	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.44@$1.45
Rosin, E. & F.....₩ bbl. $1.55@$1.65
Rosin, G. & H. .....₩ bbl. $1.70@$2.00
Rosin, I. & K.....₩ bbl $2.40@$2.75
Rosin, M. & N.....₩ bbl $3.00@$3.10

Seamless Brass Tubes .net List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr..... 3.70@ 4.00
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr..... 3.90@ 4.25
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.50@ 2.75
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½&½, guaranteed .....11¢
No. 1..... 9@9½¢
Prices of Solder indicated by private rands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢
5 p. c.

Yager's Soldering Salts.
¼-℔ bottles, each.....80¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¢@4¼¢
Bertha (pure) .....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers. Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....16¢
Straits, pigs, ₩ ℔.....15¢
Straits in bars, ₩ ℔.....16¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $6.50
Alderly, extra quality, IC, 14 x 20..5.62½
Allegheny, IC, 14 x 20..... 4.50
" IX, 14 x 20..... 5 75
Anchor IC, 14 x 20..... 4.37½
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Black Diamond (Extra Coated), IC, 14 x 20 ..... 7.50
Bonus (Extra Coated), IC, 20 x 28..11.50
" " " IX, 20 x 28..14.50
Boston, IC, 14 x 20..... 6.25
Brooklyn, IC, 14 x 20 ..... 4.50
Capitol, IC, 14 x 20..... 4.25
Central, IC, 14 x 20..... 4.75
Climax, IC, 14 x 20..... 4.50
Columbia, IC, 14 x 20..... 6 25
Columbus, IC, 14 x 20..... 4.75
Dunlap's Double Dipped, IC, 14 x 20 7.50
" " " IX, 14 x 20 8.75
" Domestic, IC, 20 x 28.....10.00
Empire, IC, 14 x 20..... 5.12½
Eureka, IC, 20 x 28..... ....10.00
Eureka, 200 lbs., IC, 20 x 28.... .... 9.70
Excelsior, IC, 14 x 20..... ..... 4.75
Filbert, IC, 14 x 20..... 7.25
Flag, IC, 14 x 20.. ..... 4.25
Florida, IC, 14 x 20..... ..... 4.75
Flushing, IC, 14 x 20..... 6 25
Freeport (Hand dipped and Resquared), IC, 14 x 20 ..... 6.50
IX, 14 x 20..... 7.75
Globe, IC, 14 x 20..... ... 4.50
Golden Star Old Style, IC, 20 x 28...15.00
" " " " IC, 20 x 28...18.00
Grace, IC, 14 x 20..... 4.25
Hamilton's Best Redipped, IC, 14x20 7.75
" " " IX, 14x20 9.25
Hickory (Resqnared), IC, 14 x 20... 5.50
Juniati, IC, 20 x 28..... .....11.50
Juno, IC, 14 x 20..... ..... 5.50
Kensington, IC, 14 x 20..... ..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20 ..... 4.75
Laufman's Apollo (Resquared), IC, 14 x 20..... 6.75
Laufman's Apollo (Resqnared), IX, 14 x 20..... 8.25
Leominster, Extra Coated, IC, 14x20.6.37½
Lion (Stamped), IC, 14 x 20..... 5.75
Lulu, IC, 20 x 28..... .....10.50
" IX, 20 x 28.....13.50
Maple, IC, 14 x 20..... ..... 5.75
Merchant's Roofing (Resqnared). IC, 14 x 20..... ..... 7.50
Meurer Roofing, IC, 14 x 20..... 7.75
National, IC, 14 x 20..... 5.50
Nava, IC, 20 x 28 .. ..10.50
New Castle Old Method, IC, 20x28.18.00
New Castle Palm, IC, 20x28.....14.50
Old Colony, IC, 14 x 20..... ..... 7.50
Osborn's Old Process, IC, 20 x 28....14.00
" " " IX, 20 x 28....17.00
Osceola, Old Style, IC, 14 x 20..... .. 7.25
" " IX, 14 x 20 .. 8.75
Pennsyl Old Method (Treble Coated), IC, 14 x 20 ..... 7.25
Phillips' Roofing, IC, 14 x 20..... 7.00
Phœnix, IC, 14 x 20..... ..... 4.75
Pullman, IC, 14 x 20..... ..... 5.75
Republic, IC, 14 x 20..... ..... 4.75
Scott's Extra Coated (Resqnared), IC, 14 x 20 .... 8.00
Scott's Extra Coated (Resqnared), IX, 14 x 20..... ..... 9.50
Standard, IC, 14 x 20 ... . 4.15
Star IC, 20 x 28 .....11.00
Superior, IC, 14 x 20..... ..... 4.50
Taylor's Old Method, IC, 14 x 50.... 6.50
Taylor Old Style (Resquared), IC, 14 x 20..... ..... 7.50
Taylor Roofing, IC, 14 x 20..... .... 6.75
The Osborn Roofing, IC, 20 x 28.....12.25
" " " IX, 20 x 28.....15.25
Thomson's Puritan, IC, 14 x 20.....5.50
Tip Top, IC (Resquared), 14 x 20.... 4.88
" IX " 14 x 20.... 6.13
Triumph, Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20..... .....4.37½
Westmoreland, IC, 14 x 20..... ..... 6.25
Willow, IC, 14 x 20..... ..... 5.25
Zero, IC, 14 x 20..... ..... 4.50

American Bright Plates—

Almond, IC, 14 x 20.....$5.25
Brilliant (Tissue Packed), IC, 14x20. 8.00
Brooklyn, IC, 14 x 20..... ..... 5.50
Century, IC, 14 x 20..... ..... 5.00
Climax, IC, 14 x 20..... .....4.87½
Excelsior, IC, 14 x 20..... ..... 6.50
" IX, 14 x 20.. .... 7.50
Florence, IC, 14x20..... 5.50
Florida, IC, 14 x 20..... ..... 5.75
" IX, 14 x 20..... ..... 7.00
Gladys, IC, 14 x 20..... ..... 4.50
Hazel, IC, 14x20..... ..... 5.80
Ivy, IC, 20 x 28..... .....12.00
" IX, 20 x 28..... .....15.00
Linden, IC, 14x20..... ..... 5.50
Merchant's Dipped, IC, 14x20..... 10.00
Merion, IC, 14x20.. .... 6.00
Mint, IC, 14x20..... ..... 5.00
New Castle Best Palm Charcoal, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
New Castle Palm Charcoal, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. .. 8.00
New Castle, Charcoal, IC, 14 x 20... 6 25
" " IX, 14 x 20... 7.50
New Castle, S. Charcoal, IC, 14 x 20. 6.00
" " IX, 14 x 20. 7.25
New Castle Palm Coke, IC, 14 x 20.. 5.75
" " IX, 14 x 20.. 6.85
New Castle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Oak, IC, 14 x 20..... ..... 4.75
Palma, IC, 14x20..... ..... 6.00
Pansy, IC, 20 x 28 .....10.50
" IX, 20 x 28 .....13.00
Phœnix, IC, 14x20..... 5.37½
" IX, 14x20..... ..... 6.75
Royal, IC, 14x20..... ..... 6.25
U. S., IC, 14x20..... ..... 7.25
Versailles, IC, 14 x 20 ....5.75
Walnut, IC, 14 x 20..... ..... 4.65
Youghiogheny, IC, 14 x 20... .. ..6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$6.25
20 x 28.....12.50
Pontymister Old Style Grade, IC, 14 x 20..... 5.50
20 x 28.....11.00
IX, 14 x 20..... 6.50
20 x 28.....13.00
Worcester Grade, IC, 14 x 20..... 4.50
20 x 28..... 9.00
IX, 14 x 20..... 5 75
20 x 28.....11.50
Dean Grade.—IC, 14 x 20..... 4.25
20 x 28..... 8.50
IX, 14 x 20..... 5.50
20 x 28.....11.00
Abercarne Grade.—IC, 14 x 20..... 4.00
20 x 28..... 8.00
IX, 14 x 20..... 5.50
20 x 28.....11.00
Mansel Grade, IC, 20 x 28 .....8.00

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Caland Grade.	IC, 10 x 14.....	$5.25
" "	IC, 12 x 12.....	5.50
" "	IC, 14 x 20.....	5.25
" "	IC, 20 x 28.....	10.50
" "	IX, 10 x 14.....	6.50
" "	IX, 12 x 12.....	7.00
" "	IX, 14 x 20.....	6.50
" "	IX, 20 x 28.....	13.00
" "	DC, 12½ x 17.....	5.00
" "	DX, 12½ x 17.....	6.50
Allaway Grade.	IC, 10 x 14.....	4.75
" "	IC, 12 x 12.....	5.00
" "	IC, 14 x 20.....	4 75
" "	IC, 20 x 28.....	9.50
" "	IX, 10 x 14.....	5.50
" "	IX, 12 x 12.....	5.75
" "	IX, 14 x 20.....	5.50
" "	IX, 20 x 28.....	1.00
" "	DC, 12½ x 17.....	4.25
" "	DX, 12½ x 17.....	5.00

Coke.

Steel Coke.—IC, 10x14, 14x20.....		4.25
	10x20.....	6.50
	20x28.....	8.50
IX, 10x14, 14x20.....		5.25
B. V. Grade.—IC, 10x14, 14x20.....		4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$11.50
IXX, 14x28..(112 sheets)..... 11.90
IXX, 14x81..(112 sheets)..... 13.25

Tinning—Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv..... ..50&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv..... 60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks..... .....₩ ℔ 4¾¢
Per ℔.....5¼¢

It Is Reported—

California.

That early on the morning of the 4th inst. the Hardware and Cutlery store of J. N. Jaeger, Los Angeles, was entered by burglars and $200 worth of Razors and Knives stolen.

Illinois.

That S. H. Dickey has sold his interest in the Hardware business at Kewanee to Edward Cable of Abingdon, the name of the new firm being Kennish & Cable.

That J. W. Tull & Son of Kinmudy have bought the Hardware and Furniture store of Col. S. C. Morrison, Ramsey, and have commenced business.

That the Hardware store of R. T. Perine, Waukegan, has been sold to James P. Hall and Harry A. Bangs, who will continue the business at the same stand under the firm style of Hall & Bangs.

Indiana.

That Dr. I. F. Lawshe has purchased a half interest in the Hardware store of J. H. Galbreath at Swayzee.

Iowa.

That the Hardware store of C. E. Ward, Humboldt, was robbed on the 3d inst. of $300 worth of Knives, Razors and Revolvers. The thieves have been arrested.

That J. W. Ryan of Fort Dodge has removed his Hardware stock to a new store.

Kansas.

That the Van Zandt Hardware Company of Hutchinson have opened a branch store at Wichita.

That McMillan, Ingham & Sprague, Hardware, &c., Morrill, have been succeeded by McMillan & Ingham.

Kentucky.

J. H. Dagg, contractor and builder, Hopkinsville, has, with C. G. McDaniel, entered the Hardware business at that point. Mr. McDaniel has had several years' experience in this line.

Maine.

That the firm of Howes & Chase, doing a general Stove, Tinware, Hardware and plumbing business at Portland, have been dissolved by mutual consent. Chas. E. Howes will hereafter conduct the business under his own name.

That the wholesale Hardware firm of Smith, Tibbets & Co., Portland, were dissolved by mutual consent on the 31st ult. The business will be continued by Henry L. Houghton and Lucius M. Clark under the firm name of Houghton, Clark & Co.

Massachusetts.

That John S. Morrison and James S. Murphy, doing business under the style of the Salem Hardware Company, Salem, have dissolved partnership by mutual consent.

That the Iron, Steel and Hardware business conducted at 30 and 32 Lyman street, Springfield, by Charles C. Lewis, will be carried on hereafter by the Charles C. Lewis Company. This is a change in the name only, the management continuing as before.

That William D. Huntoon and Hosie Bros., Hardware merchants of Franklin, have joined with other merchants in the town and agreed to close their stores three evenings a week.

Minnesota.

That the Marshall-Wells Hardware Company of Duluth, in addition to the lines of miscellaneous Hardware heretofore carried by them, have completed arrangements for handling throughout the Northwest the product of the Mannville Pipe Covering Company of Milwaukee, Wis. The company have associated with them in this new department William Phillips, formerly of Saginaw, Mich. The company have increased the number of their traveling men to 17. They are about to make additions to their warehouse, and have recently taken out building permits for this purpose.

That in a large fire at Excelsior, on the 31st ult., the Hardware store of Phelps & Co. was consumed. Loss, $3000; insurance, $1000.

Missouri.

That the Hardware firm of Wolf & Desmond, Edwardsville, have been dissolved. A. P. Wolf will continue the business at the former stand.

That on January 1 Mr. Sherpy of the Hardware firm of Haysler & Sherpy, Clinton, retired from the firm. Mr. Sherpy had been in business for a quarter of a century. E. C. Haysler has succeeded Mr. Sherpy and the style of the firm will hereafter be the Haysler Hardware Company.

That William Berry has purchased the entire Hardware stock of P. W. Bain & Son, Spickard.

Nebraska.

That George Lingelbach has entered the Hardware business, at Decatur.

That M. H. Kraxberger, Hardware merchant, Brady Island, has sold out.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A man who thoroughly understands CORNICE WORK and getting out galvanized iron fronts; must be capable of cutting patterns from drawings and superintending construction and putting up work; only a first-class man need apply. P. O. Box No. 3, Jersey City, N. J. Jan. 19

A practical TINNER, one who understands general country jobbing, with a fair knowledge of plumbing, steam pipe and furnace work; must be strictly temperate and reliable; a steady job to the right man; state age, weight, experience, married or single, and wages expected. Box 80, Warren, Mass. Jan. 19

A good live TRAVELING AGENT to take our specialties as a side line on a commission. Zero Valve Company, 212 Seneca street, Buffalo, N. Y. Jan. 19

A CORNICE MAN, who can estimate and work from architects' drawings; one who thoroughly understands cornice work in all its details. "A. B. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

A good TINSMITH for country tin shop; one who has some knowledge of steam heating and furnace work; must be steady and sober; married man preferred. Box 128, Townsend, Mass. Jan. 19

Two experienced STOVE SALESMEN for New York State. Address, with references, "COMPANY," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

A PLUMBER for the South, with a fair knowledge of tin work; to a good man a permanent position will be given; state wages wanted, age and experience. Box 1307, Talladega, Ala. Jan. 19

One good TIN, SLATE and GALVANIZED IRON CORNICE WORKER, 35 or 40 years of age; married man preferred; $2.50 per day; steady work. "E. J.," 68 West Main street, Lexington, Ky. Jan. 19

CORNICE CUTTER; careful man of good habits, in city 200 miles west of Chicago; state, with references, what wages per month. "H. H.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 19

At Cleveland, Ohio, FOREMAN for small machine shop, working on repair work; applicant must have practical experience, with fair education. Address in own handwriting, stating age, experience, education and wages expected, "Foreman," care E. S. Adams, 312 Cuyuhoga, Cleveland, Ohio. Jan. 19

METAL SPINNERS. John C. Jewett Mfg. Company, Buffalo, N. Y. Jan. 19

A thoroughly competent man to act as superintendent of 100 men in the capacity of FOREMAN in the manufacture of a full line of tin and copper goods; must be a tinsmith and a man of experience, and also familiar with machinery, dies, &c.; give references and salary expected. Lock Box 2141, Batavia, N. Y. Jan. 19

A first-class TINSMITH on ware, to manufacture Model milk coolers, one that can furnish some capital. H. W. Gazlay, Cortland, N. Y. Jan. 19

First-class METAL PATTERN FITTER, capable of taking charge of pattern department of large manufacturing company. "Pattern Fitter," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

A good WOOD PATTERN MAKER. "F. W. R.," P. O. Box 625, Louisville, Ky. Jan. 12

A live STOVE SALESMAN that has and can sell goods—no other need apply—to travel Central and Southeastern Indiana and Western Ohio; to represent a good line of goods manufactured by an Indiana manufacturer; in applying, state how long you have been on the road; give age, whom you have traveled for, how long with last employer; give reference; salesman located at Cincinnati preferred. "Indiana," office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. Jan. 12

TRAVELING SALESMAN; first-class steel range salesman; one thoroughly conversant with steel ranges; state age, territory traveled and with whom last employed. "Steel Range," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 12

A good man who understands the manufacturing of steel furnaces; must come well recommended. Foster Baily, 10 Addison street, North Indianapolis, Ind. Jan. 12

A competent man to manage large tin shop; must be successful solicitor, experienced and first-class furnaceman, thorough mechanic, with experience in fine job and sheet metal work; executive ability of a high order necessary. Wm. Lyle Dickey & Co., Omaha, Neb. Jan. 12

First-class metal PATTERN FITTER, capable of taking charge of pattern department of large manufacturing company. "Capable," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

A FOREMAN for a steam, hot water and hot air heating and plumbing business, employing 20 men; is located in a live New England town of about 10,000 inhabitants; must be thoroughly familiar with all the details of the business; strictly temperate; of good memory and judgment; a hustler and able to control men; a man who has been in business for himself preferred; to the right man an interest in the business is open if desired; state age, experience, reference and salary expected. "Enterprise," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

A good man to do PIPING and general jobbing in a tin shop; state wages. Jas. A. Sandford, Bridge Hampton, N. Y. Jan. 12

SALESMAN for a line of hot water, steam and hot air furnaces for the State of New Jersey; send memorandum of experience with your answer. "N. H. F. Co.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

SITUATIONS WANTED.

By Eastern representative, a SALESMAN acquainted with wholesale hardware and rubber goods trade in New York City to sell specialties on commission. "A. H. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

By a young man 24 years of age as METAL PATTERN MAKER; served an apprenticeship as tool maker, in addition to five years in pattern shop; familiar with foundry practice; a bright, capable man with ideas; for reference address any foundry in Newark, N. J.; salary moderate; any one wanting a pattern maker who knows his business and can attend to it, address E. E. Beckwith, care of A. C. Beckwith & Son, 62 Mechanic street, N. J. Jan. 19

By a first-class PATTERN FITTER, 20 years' experience on stoves and ranges; have worked for Bussey & McLeod of Troy. Cleophas La Rose, 113 Second avenue, Lansingburgh, N. Y. Jan. 19

As FOREMAN, by a first-class stove plate molder; 15 years' experience; good references; 35 years of age; married; can speak English and German. "Stove Plate," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

By a young man as PLUMBER and GAS FITTER; first-class jobber; wages moderate; city or country. A. Zach, 718 Second avenue. New York City. Jan. 19

As TINSMITH; ten years' experience on tin, copper and sheet iron work, furnaces, stoves, roofing and general jobbing; strictly temperate and reliable. "Tinner," office of *The Metal Worker*, 146 Franklin street, Boston, Mass. Jan. 19

By a TINNER; good at furnace work, pumps and all kinds of piping; strictly sober and always willing to work; good references. Geo. E. Myra, Box 487, Bethel, Conn. Jan. 19

Steady position by a TINSMITH; young man; accustomed to inside and outside work; inside work preferred; wages moderate. Thomas Wall, 200 Navy street, Brooklyn, N. Y. Jan. 19

As PLUMBER'S HELPER: at present working at another branch of business, but attending a plumber's trade school at night. George Rabe, 432 East sixteenth street, New York City. Jan. 19

By a first-class PLUMBER, who can do tin and sheet iron work, pump work and general jobbing. "Plumber," Box 341, Hyannis, Mass Jan. 19

As PLUMBER by a young man 26 years of age; references; city or country. "J. N.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

By a PLUMBER; first-class mechanic; city or country; best of references. "W. G.," 201½ West Sixty-sixth street, New York City. Jan. 19

By a TINSMITH, CORNICE and SKYLIGHT MAKER, who learned his trade in Germany; five years' experience in America; 22 years of age; wages moderate; steady work desired; New York City preferred. J. Grossberger, 807 East Ninth street, New York City. Jan. 19

By a man who has had 35 years' experience at steam, hot water and hot air heating with ventilation; position desired in the East. A. B. Sanford, 1760 Howard street, San Francisco, Cal. Jan. 19

Permanent position desired by a practical SLATE and TIN ROOFER with experience in cornice work; can furnish best of references; married; temperate; slater by trade. F. Burry, care of Tooffman & Co., 722 Columbia street, Hudson, N. Y. Jan. 19

By a young man, with four and a half years' experience at plumbing and steam heating; will work for moderate wages; willing to go anywhere. "J. A. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

By first-class PLUMBER; city or country; reference. Jos. Smollon, 533 West Thirty-ninth street, New York City. Jan. 19

By a young man having ten years' practical experience in the installation of hot water and steam heating apparatus; capable of estimating upon and laying out work; good salesman and thoroughly competent of taking charge of men and superintending work. "Hot Water," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

I am in a position to handle hot water and steam heating boilers at less expense to the manufacturer than regular salary and expenses; I have had many years' experience and think I possess average ability; I cover a large territory and would like to hear from any manufacturer having a good heater. Andrew J. Lyon, Norwich, N. Y. Jan. 19

By a young man as TINSMITH in a good country job shop; best of references. J. Watts, Matamoras, Pa. Jan. 19

By a first-class TINSMITH, COPPER and SHEET IRON WORKER; Scandinavian; speaks English and German; want steady position; accustomed to all inside and outside work and general jobbing. A Nendel, 307 Avenue C, New York City. Jan. 19

By a TINSMITH; 17 years' experience at inside and outside work; well acquainted with furnace, range and hot water heating work and country plumbing; best of references as to character and ability; willing to make a contract with a reputable firm for steady work at fair wages; married; German. "W. F. H.," care of A. Maass, 339 East Twenty-second street, New York City. Jan. 19

A FOUNDRY FOREMAN by molder of long experience; stove or general castings; willing to file and fit up patterns, make flasks, follow boards, &c.; practical melter; reliable where economy in a furnace is wanted. "Reference," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

A good job by a TINNER and PLUMBER; 15 years' experience in one place; 32 years of age; also good tuba player; extra strong. A. B. Bruce, Andes, Delaware County, N. Y. Jan. 19

By a young man who has had five and one half years' experience at plumbing and gas fitting; can do city or country work; good reference. Wm. C. Alm, 58 East Penn street, Morristown, Pa. Jan. 19

By a young man as PLUMBER; city or country; wages moderate; good worker. Oscar Bormann, 1325 Second avenue, New York City. Jan. 19

By a licensed PLUMBER and general all round man who understands furnace work, steam and hot water heating; have been in business, and am well acquainted with all requirements; steady position desired in New York State. James A. Reber, 5 Cliff street, Beverly, Mass. Jan. 19

By a good TINSMITH; well experienced in furnace, cornice and general job work; married and temperate; permanent situation desired; 20 years' experience. C. M. Acuff, Pekin, Ill. Jan. 12

PIG IRON SALESMAN, now representing a well-known house in New York and New England, wishes to make a change at once; will travel or locate in any territory; refer to present employer. "S N.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

SALESMAN, now at liberty, former line pig iron; I want to travel with hardware or any other good line; best of references as to ability, habits, &c. "White," office of *The Metal Worker*, 96-102 Reade street, New York. Jan. 12

By a WOOD PATTERN MAKER of practical and proficient knowledge of stove and range work from the drafting table to the sand; 12 years' experience; six years foreman of large pattern shop. "Wood," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

By a young man, 19 years of age, who has been an assistant to a tinsmith and steam fitter; would like to finish trade; steady and sober. "Jersey," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 12

By a PLUMBER, 22 years of age. P. O. Box 515, River Head, L. I., N. Y. Jan. 12

Special Notices.

FOR SALE.

The leading stove store in a growing manufacturing city of 20,000, near New York. This is an old, and the best business stand in the city. Large store and moderate rent. We do Steam and Hot Water and Hot Air Heating, Plumbing and Tinning. This is a good investment, but present owner has too much other business to see to. Can inventory down to $3000. Address "A. A.," No. 119 office of *The Metal Worker*, 96-102 Reade St.. N. Y.

NEW SCREW CUTTING LATHE and Double Seaming Machine and second-hand Squaring Shears, Rotary Shears, Beading, Grooving and Setting Down Machine, also a number of other machines and stakes of different kinds and two large Heating Stoves, suitable for store or hall, cheap. Inquire at 507 EIGHTH AVE, New York City,

WANTED.

A perfect copy of *The Metal Worker*, issue of September 23, 1893. Please address
SMITH & ANTHONY COMPANY,
Boston, Mass.

WANTED

for 1895, Side Lines, to handle on commission. Must give territory.
HANSELL & BELSON,
144 North 2d St., Philadelphia

FOR SALE OR TO RENT.

Hardware, stove, tin, housefurnishing business; established over 25 years; a good store and shop, with public hall above; the only shop in the vicinity; a first-class dwelling house next door; close to depot and post-office; the stock and tools reduced to about $550; just the spot for a young man; will rent the store, shop and house, but would prefer to sell on reasonable terms. Address
"W. B.," Box 35,
La Grengeville, N. Y.

FACTORY AT WHITESTONE FOR SALE (30 minutes from New York), with boilers, 15 horse-power engine, machinery, tools, etc. Price, $5000; terms, $2000 cash, balance on mortgage at 6 per cent., if desired. Located on L. I. R. R. and the Sound, affording cheap water freights. Very advantageous for any light manufacturing, such as metal work, novelties, hardware, etc. Lot 50x100 facing on two thoroughfares, three-story brick building, 30x90, with boiler and engine annex building. Address "FACTORY," P. O. Box 2718, New York City.

FOR SALE.

An old established Hardware, Plumbing and Tin business in one of the best towns in California. Will invoice about $5000. Population 5000 and thickly settled surrounding country. Owner has made a small fortune in a few years and doing a good business at present. No shop-worn stock. Best of reasons for selling will be given to inquirers. Address "PACIFIC," care *The Metal Worker*, P. O. Box 521, New York City.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

130 tons of Sheet Steel from a wrecked stand pipe, a large portion in good condition. Address
P. O. BOX 155,
Maryville, Mo.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.
YATES & CO., Rockford, Ill.

Special Notices.

RECEIVER'S SALE.

Notice is hereby given that by virtue of an order of the Howard Circuit Court in the case of John S. Connor, trustee, versus the William G. Fischer Manufacturing Company, the undersigned offers for private sale on and after the twelfth day of January, 1895, all of the real estate owned by the said plant and situated in Kokomo, Howard County, in the State of Indiana. He will also offer for sale at the same time all of the machinery, boilers, engines, tools, appliances, patterns and patents belonging to and used in the manufacture of ranges and safes. In making said sale, he will offer to sell the real estate separately and also the machinery, tools, etc., above specified, or he will sell them as an entirety and will receive bids accordingly.

Terms, one-third cash, balance in nine and eighteen months with interest at 6%, with approved security.

G. W. LANDON, Receiver.

FOR SALE.

A No. 8 Sturtevant Blower, Countershaft and Pulley complete. This blower has been melting from 10 to 12 tons of iron per hour. Address
SCANLAN & CO.,
Louisville, Ky.

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,
Solicitors of Patents.

OFFICES:
PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row
WASHINGTON,
Atlantic Building, 928 F. St.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. Twenty Years' Experience. Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.
PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.
E. B. STOCKING, Attorney at Law.
611 F ST., N. W., WASHINGTON, D. C.

Special Notices.

FOR SALE.

STOVE PLATE GRINDER,

Complete with countershaft, Tilting Table, Automatic Spindle. Made by the Tanite Co. Has never been used. Will sell very cheap.
S. GREEN & SONS,
Des Moines, Ia.

WANTED.

A practical corniceman can make favorable lease of established shop. Some capital and good references required. Address "H. H.," office of *The Metal Worker*, 59 Dearborn St., Chicago.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

KEUFFEL & ESSER CO.,

127 Fulton and 42 Ann Streets, NEW YORK.

Branches: 111 Madison Street, Chicago. 708 Locust Street, St. Louis.

Drawing Materials AND Surveying Instruments.

Write for

Keuffel & Esser Co.'s Catalogue of 1895.

26th Edition.

Enlarged by over 100 pages. The most complete and reliable catalogue, representing the largest and most complete stock in this line.

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address
"STOVE FOUNDRY,"
Office of *The Metal Worker*, 96–102 Reade Street, New York.

Send for a descriptive circular, with sample pages, of the METAL WORKER PATTERN BOOK. Even if you are not ready to buy, you want to know just what kind of book it is and how it would help in your work. DAVID WILLIAMS, Publisher, 96 - 102 Reade Street, New York.

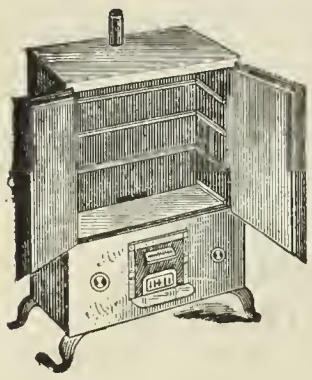
Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



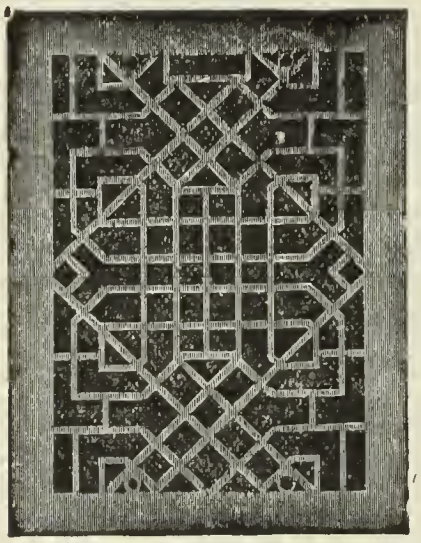
Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.
Burlington, Vt.



Warm-Air Registers, Ventilators, Etc. Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.

Odd Statistics of Cities.

Paris has the greatest number of tailors, paperhangers, dressmakers, wigmakers, lawyers and authors; London has more hackdrivers, engineers, printers, booksellers and cooks than any other city; Amsterdam has most "cranks collecting anything" and usurers of any city; Brussels is the town of rogues and smoking children; Naples the town of "Lazzaronis;" Berlin of soldiers and beer drinkers; St. Petersburg of adventurers; Vienna of musicians; Florence of flower girls; Lisbon of porters; Constantinople of idle officials.

—SUNDAY SCHOOL TEACHER: "Now, is there any one in the class that wants to ask a question?"

New Boy: "Are you going to have a Christmas tree?"—Exchange.

— A MAN'S DESCRIPTION. — Watts: "Mrs. Potts just looked stunning in her new outfit this afternoon."

Mrs. Watts: "How was she dressed?"

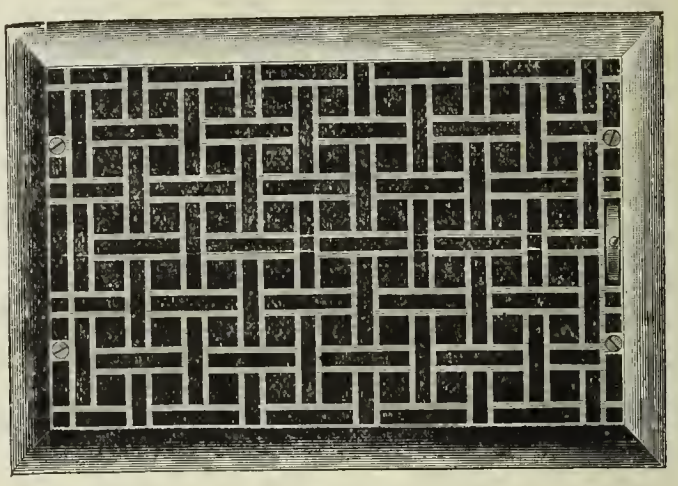
Watts: "I can't exactly describe the rig, except that it had these pneumatic sleeves."—*Cincinnati Times.*

— JIMSON: "Is Jackson making money?"

Billson: "I guess so. He has begun calling his customers his clientele."—*New York Weekly.*

TUTTLE & BAILEY MFG. CO.,

REGISTERS, VENTILATORS, &c.



LATTICE PATTERN CONVEX

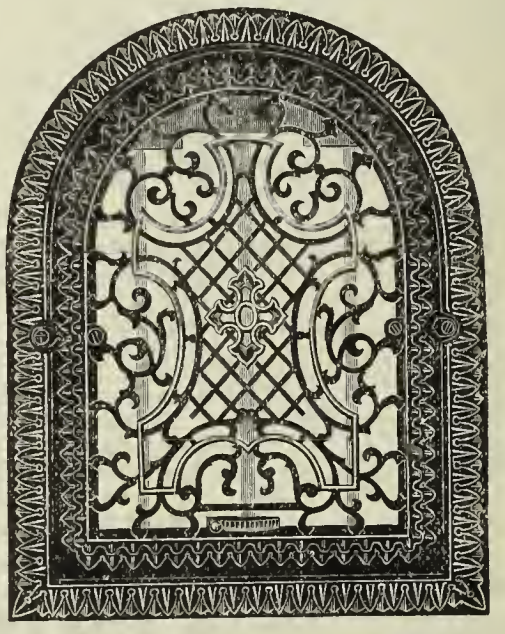
REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.

WM. HIGHTON & SONS,

MANUFACTURERS

Hot Air Registers,



CIRCULAR TOP REGISTER
With Wall Frame.

Ventilators, Etc.

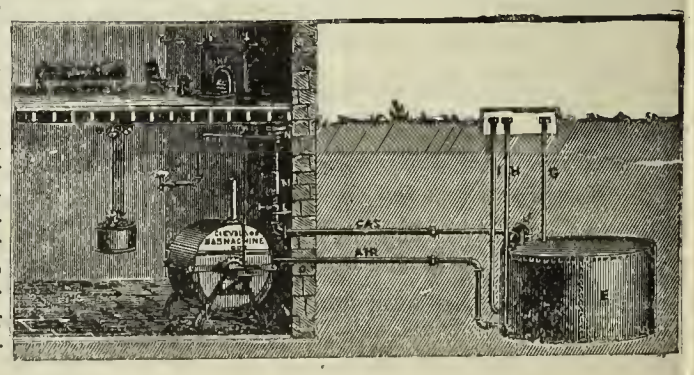
BOSTON, MASS., - and - NASHUA, N. H.

CLEVELAND GAS MACHINE CO.

82 Champlain St., Cleveland, Ohio.

Please send for { Reduced Price List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engives.

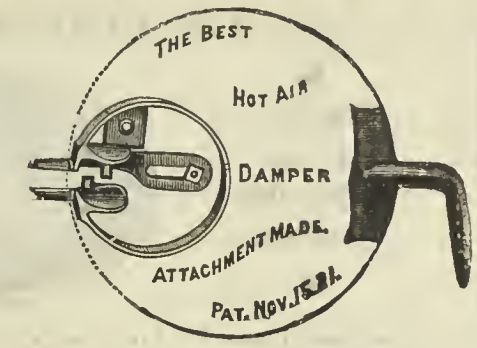


BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, New York.

Crown Damper and Crown Damper Attachment.





NICKEL PLATED HANDLE. PUT UP 1 DOZ. IN A BOX.

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

AMERICAN Dampers and Clips.

WAFFLE IRONS.

THE BEST

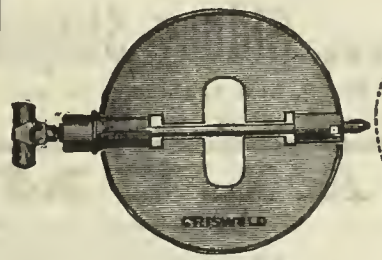


For Gas or Gasoline Stoves.

Easy to Clean, Long Wood Handles.

BUY *NO OTHER.*





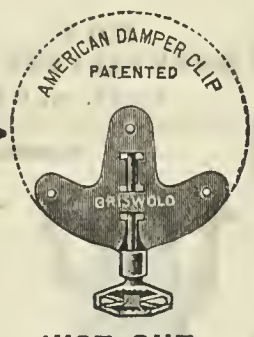
Wood or Nickel Handle.

BEST SELLER.

ASK FOR THE

AMERICAN.

Buy no Other.



JUST OUT.

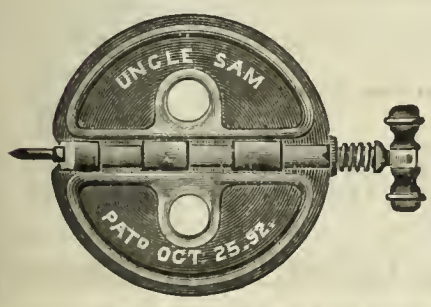
BEST CLIP MADE.

Send for Samples.

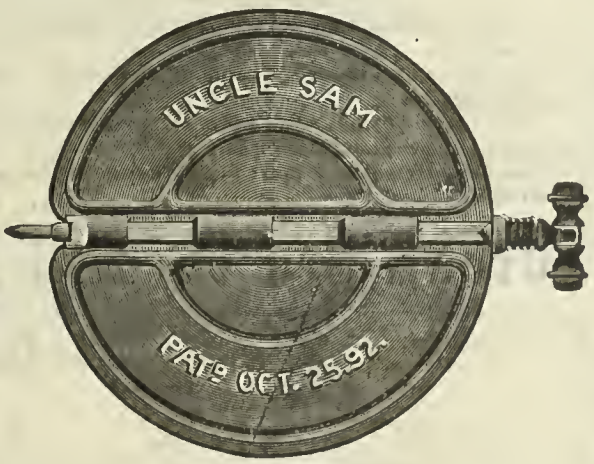
GRISWOLD MFG. CO.,

ERIE, PA.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers

ROOFING SLATE.

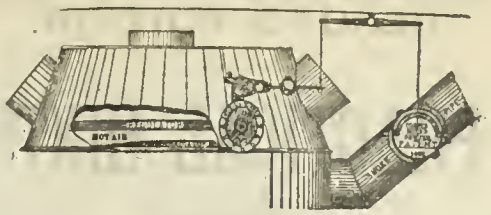
OUR BANGOR UNION, ALBION & MAMMOTH VEIN QUARRIES

PRODUCE THE FINEST SLATE IN PENNSYLVANIA & VERMONT

HAND SHAVED BANGOR SLATE BLACK BOARDS

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS

AULD & CONGER, 100 EUCLID AVE., CLEVELAND, OHIO.



I have the Best Automatic Furnace Regulator made up to the present time, and it is solid, durable and easy to put on. Damper with copper bearing. Wholesale and retail. Twelve years in use.

W. E. PUFFER,

8 PECK SLIP, NEW YORK.

CHEAPEST AND BEST.

Mfd. by



John Wise & Son, BUTLER, O.



Do Not Be Afraid to Talk.

"A man should talk about what he knows, and only about that. Then he may say something worth hearing. As regards other things, he should hold his tongue, and then he won't make a fool of himself." So says the parlor oracle, and shuts his mouth with a snap. And no doubt the logical position is, or appears to be, a very strong one. No man can know more than a very few things thoroughly. A man can only say what is worth hearing on things he knows thoroughly. A man should not talk except he says things worth hearing. Therefore, a man should not be discursive, and should confine himself to his own subjects.

Such is the outline of the syllogisms by which the discursive talker is put down, pulverized, and, if not reduced to silence, at any rate conclusively proved to be a babbling jackass. But, in spite of the excellence of the logic, we all know that in fact the discursive talker can be, and often is, a most delightful talker, and that in spite of all the rules and all the schools, one may gain a great deal more, not only of amusement, but of information, from the man who is not afraid of talking of anything in heaven above or the earth beneath than from the correct and pedantic gentleman who is always lying in wait for his own subject to turn up, and when it does turn up, promptly blows it to pieces by discharging at its head an 81-ton gun, loaded to the muzzle with facts and statistics. The discursive sportsman would have neatly put a bullet through the brain, and would have brought the game down unspoiled. The expert who has bottled up his knowledge for a year blows it to smithereens, and leaves nothing but a few scraps of fur or feather.—*The Spectator.*

— COBWIGGER: "I've fiddled away a week trying to get up a design for a home-made flower stand for use in the *Ladies' Friend.*"

Terwilligger: "That shouldn't be such a hard job."

Cobwigger: "But you don't understand. The idea is to get up something that can be made entirely by a woman; so, it musn't have any nails in it."—*Sunday Journal.*

SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

48 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

DAVID WILLIAMS,

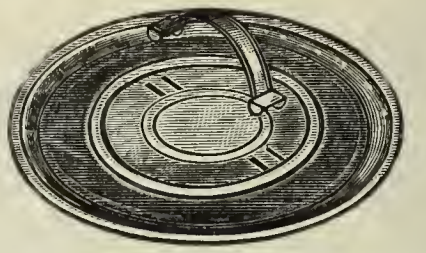
PUBLISHER,

96-102 Reade St., New York.

A Distinct Improvement!

——THE BUFFALO POT COVERS——

With Loose Attachable Handles.



With Loose Attachable Handles.

No woman likes a Pot Cover with a ring attached; she prefers a tin handle, but if the handles are soldered on the stock is an awkward one for the dealer and a dozen occupy as much room as a gross of the "Buffalo."

One dozen Covers and Handles packed in a neat pasteboard box, about an inch deep. Handles may be attached by any one instantly AS REQUIRED. Four slots, as shown in cut, are punched in cover, into which the tongues on the handles may be readily inserted and bent over on the under side, with the fingers, *securely* and *firmly* fastening the handle to the cover.

Make up an order from our catalogue (ask for one if you haven't one) and include a sample lot of these Covers.

SOLE MANUFACTURERS, Sidney Shepard & Co., Buffalo and Chicago.

CHAS. W. WELLS, New England Sales Agent, 19 Pearl St., Boston, Mass.



ALUMINUM

Ingots, Sheets, Rods, Tubes, Wire and Castings,
Cooking Utensils and Tableware,
Tea and Coffee Pots, Chafing Dishes, Rice Boilers, &c.
Write for New Catalogue.

THE WOHLER ALUMINUM COMPANY,

55 Jackson Street, - - - - Chicago, Ill.



Before. After.

Covert Pants Stretcher.

THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

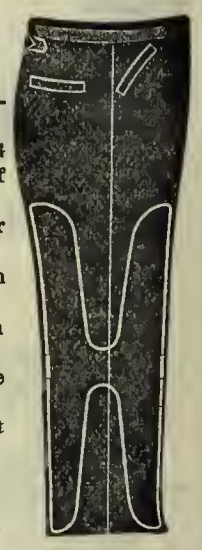
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

MANUFACTURED ONLY BY

COVERT MFG CO., West Troy, N. Y.





Patent applied for.

The Lightning Skate Sharpener.

With Key and Wrench Combined.

Is the Greatest Little Seller of the Age.

Every skater will buy one when shown. It is only necessary to get two or three out in the boys' hands to set the whole town wild for them.

They can be had of any of the following wholesale houses:

T. M. Roberts Supply House, Minneapolis.
Lewis Bros. & Co., Montreal, Quebec, Can.
Kerr & Robertson, St. John, N. B.
Roberts Stove & Hardware Co., Denver.
The Henry Sears Company, Chicago.
Wells & Nellegar Company, Chicago.
Hatch Cutlery Company, Buchanan, Mich., and 97 Chambers St., N. Y.
Hammacher & Delius, Exporters, N. Y. City.
Puritan Cycle Works, Portland, Me.
A. F. Shapleigh Hdw. Co., St. Louis, Mo.
The Strichter Hdw. Co., Reading, Pa.
G. J. Morton, Yarmouth, N. S.
Barrett Hdw. Co., Joliet, Ill.
Rath & Stone, 57-60 Wilshire Bldg., Cleveland, Ohio.
Butte Hdw. Co., Butte, Mont.
Wyeth Hdw. & Mfg. Co., St. Joseph, Mo.

Manufactured by

SANDWICH NOVELTY CO., Sandwich, Ill.

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

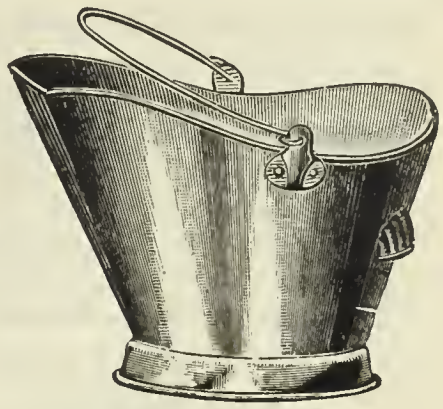
—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

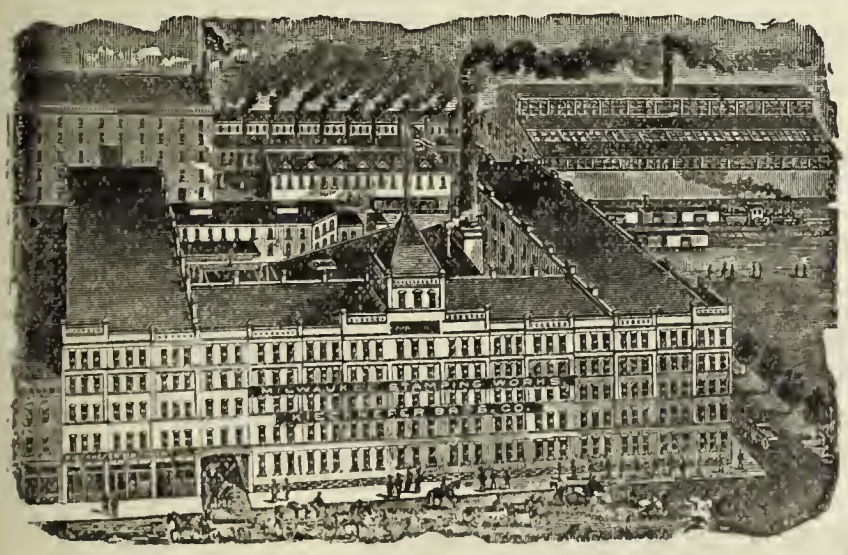


Agents for SPLENDID OIL COOKING STOVES and MAJESTIC OIL HEATING STOVES,

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED, JAPANNED AND ENAMELED PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.

Correspondence Solicited.

STANDARD MAKES

FILES

LOWEST PRICES

Hammacher, Schlemmer & Co., - 209 Bowery, New York.

Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10 inches, Cloth. Price, $3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

CONTENTS:

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Sauce pans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS,

Publisher,

96-102 Reade St., NEW YORK.

For

1895

We respectfully solicit your orders for

Pieced Tin Ware,
Stamped Tin Ware,
Japanned Tin Ware,
Black Sheet Iron Ware,
Galvanized Sheet Iron Ware,
Enameled Ware,

and guarantee satisfaction, both as to quality and prices.

Respectfully,

The Geuder & Paeschke Mfg. Co.

Manufacturers,

St. Paul Ave. and 15th St., Milwaukee, Wis.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

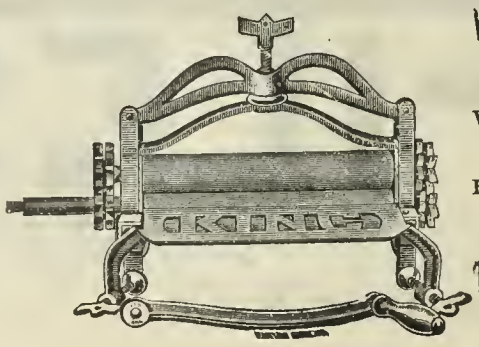
A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces. Length, 10 inches. Can be sold in all seasons.

Write to Manufacturers for Prices.



WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

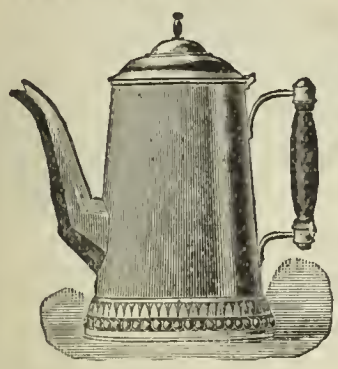
Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue:

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.

ROCHESTER STAMPING WORKS. ROCHESTER, NEW YORK,



"ROCHESTER" TEAPOT.
Patented.

WANT **50,000** NAMES

To which they may address their

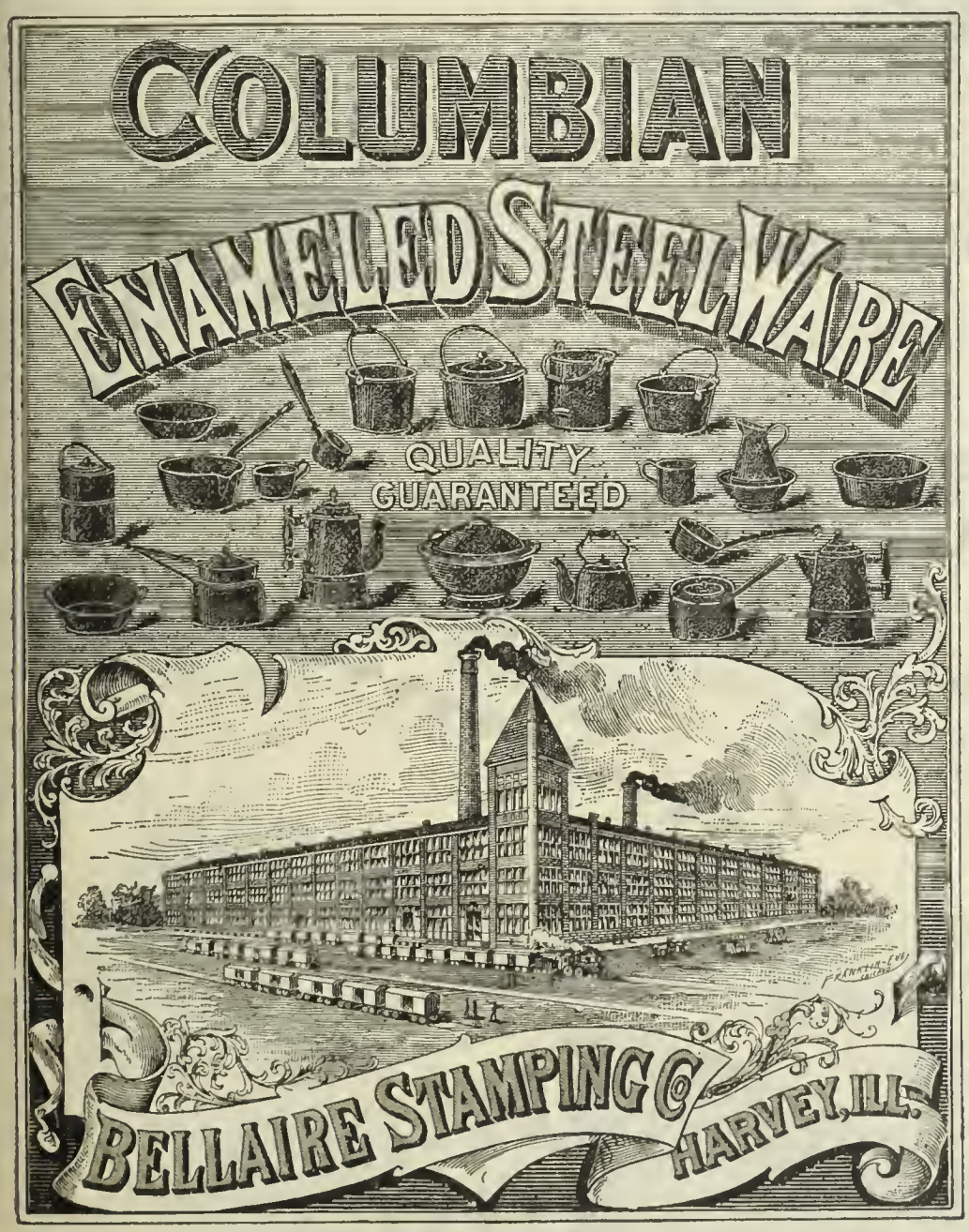
NEW CATALOGUE

For 1895.

No Goods Genuine without our Name.



"ROCHESTER" CUSPIDOR.
Patent Pending.







LOOK HERE!

Hardware and Housefurnishing Dealers,

You want to sell the **"CRUSTY"** Bread Pan.

WHY? BECAUSE it's the most perfect Bread Baker ever made. It is indorsed by the leading cooking schools. Dealers should supply themselves at once. We are now advertising in the Household Journals of largest circulation, such as *The Ladies' Home Journal*, *The Delineator*, etc. You should prepare for the inquiries sure to come. Let us send you sample for 10c. to pay postage. Your order will follow. Made only by

THE NILES MFG. CO., - Niles, Ohio.

NEW YORK ELBOW CO.,

18 Cliff St., N. Y. City.



Makers of Elbows AND Roasters.



The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O,

THE TRIUMPH COOKER,

WITH LOCK COVER.

STEAMLESS, ODORLESS AND NON BOIL-OVER.

THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.

A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.



THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN

F. H. LAWSON, Pres.
FENTON LAWSON, Vice-Pres.
WILLIAM C. LAWSON, Treas.
F. ROGERS LAWSON, Secy.

ESTABLISHED 1816

THOMAS LAWSON. 1816 — 1841.
FENTON LAWSON. 1824 — 1853.
GEO. P. LAWSON. 1852 — 1854.
F. H. LAWSON. 1852 —

Wm G. COFFIN. 1854 — 1883.
FENTON LAWSON 1878 —
Wm C. LAWSON. 1886 —
F. ROGERS LAWSON 1894 —



OFFICE AND SALES DEPARTMENT.
186-188-190
MAIN ST.
CINCINNATI, O.

IMPORTERS OF AND DEALERS IN TIN PLATE, COPPER, BRASS, GALVANIZED SHEET IRON, REFINED SHEET IRON, TINNERS' TOOLS AND MACHINES, TINNERS' SUPPLIES, ETC.

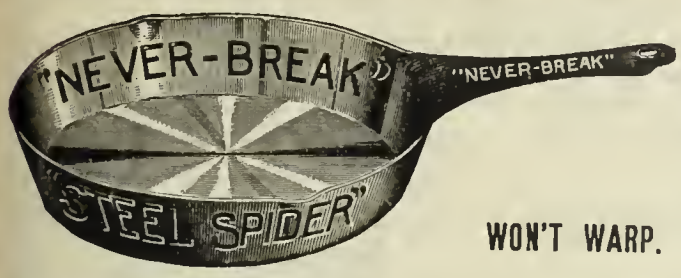
LAWSON'S OLD PROCESS GUARANTEED ROOFING PLATE

. . . . MANUFACTURERS OF . . . .
Pieced Tin Ware, Japanned Ware,
Galvanized Iron Ware, Toilet Ware,
Water Coolers, Coal Vases, Street Lamps,
Galvanized Oil Tanks and Cans,
AND OTHER SPECIALTIES.



FACTORY BANK AND OSIRIS ST.

"NEVER-BREAK" STEEL HOLLOW WARE



WON'T WARP.



WON'T WARP.

STEEL SPIDERS, GRIDDLES, KETTLES, MASLINS, ETC.

Send for Catalognes of all our lines and Discounts.

THE STANDARD FOR WEIGHT, FINISH AND PRICE.

IMMEDIATE SHIPMENTS GUARANTEED.

The Bronson Supply Co., New York and Cleveland.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

Write us for Catalogue and Prices.



ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.



The "Jewel"

Tooth and Nail Brush Holder.

(Patented Feb. 6, 1894.)

THIS new and novel article fills a long-felt want for an attractive, durable and useful Tooth and Nail Brush Holder. It will hold any size brush, and, as each openin is num bered, the brushes are kept separate and there is no possibility of getting the wrong one. The ornamentation is lithographed on the surface, and it will not peel or wear off.

For sale by all first-class jobbers in House Furnishing Goods, Hardware, Druggist Sundries and Department Stores. Sample mailed on receipt of 15 cents.

KEEN & HAGERTY,

32 S. Calvert Street, BALTO., MD.

The Best in the World.



IWAN'S

Pat. Improved Post Hole Auger

Is CONVENIENT and EFFECTIVE IN OPERATION.

Excellence of Material and Construction.

Awarded Medal and Diploma at the World's Columbian Exposition, 1893.

For sale by all leading jobbers in the U. S. and Canada.

IWAN BROS.,

SOLE MANUFACTURERS,

STREATOR, - ILL.

— UNCLE TREETOP (on his way to the dentist's office): "Most likely it'll stop achin' by the time I git in the chair. If it does, I swan I'll pretend I've made a mistake and tell him I want a hair-cut."—*New York Herald.*

NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. / Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 in.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

You ought to.

A GREAT many merchants are using

Ladd's Discount Book.

Every day adds to the number of those who highly esteem this valuable work. Very many people both in America and abroad have commended it highly as a time-saver and money-earner. It is positively

Accurate, Saving many times its cost in preventing errors.

Rapid, - - Saving much valuable time, and "Time is Money."

Practical, As proved by its constant use by those who would not now do without it.

The cost is small, the book will last for years, you can depend upon the results without proving.

A great many bright people are using LADD'S DISCOUNT BOOK, and

You ought to.

Regular Edition, $3.00 } Sent postpaid upon receipt of price by
Double Indexed, 4.00 }

DAVID WILLIAMS,
Publisher and Bookseller,
96-102 Reade Street, - New York.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,
74 Beekman Street, New York.
Foundry, Perth Amboy, N. J.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

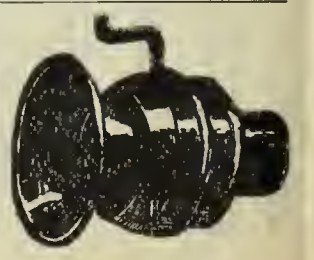
TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

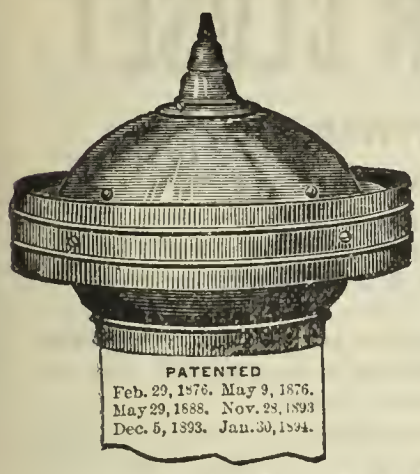


W. R. OSTRANDER & CO.,
204 FULTON STREET, NEW YORK.
Manufacturers of
Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.



THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers original patterns

MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

LIVE IN JERUSALEM ?

It don't make any difference where you live ; we allow all freight charges on

RUTLAND STOVE LINING.

IT FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

"FIRESTONE"

Has proved I self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



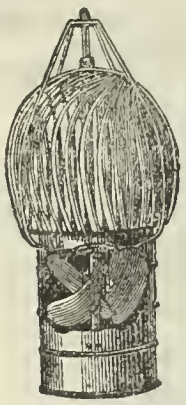
Designers of national reputation. Superb mechanical facilities

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

SELF LUBRICATING



Rotary Screw Ventilators

WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

48 Cortlandt St., New York

☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

315 North 2d St., - - - Philadelphia.

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.

Established 1866.

EDWARD L. CALELY,

STOVE PATTERNS

TO ORDER.

945 Ridge Ave., PHILADELPHIA, PA.



THE DIAMOND THIMBLE IS THE BEST.

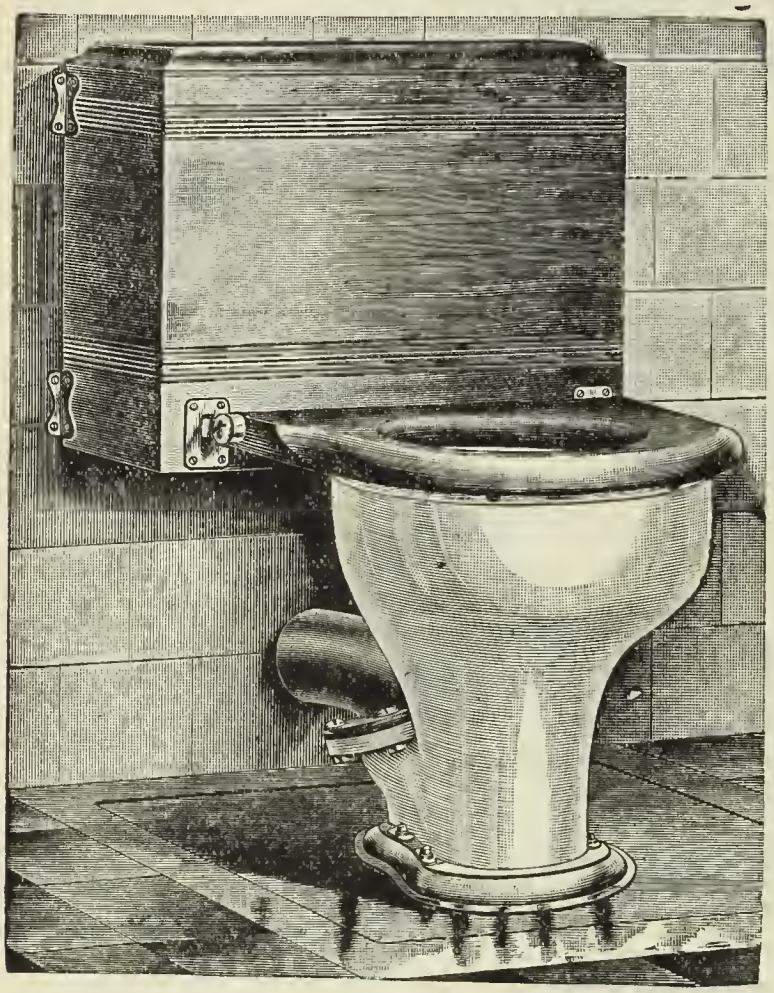
Manufactured by

S. CHENEY & SON

MANLIUS, N. Y.

PURITAN WASH DOWN WATER CLOSET.

Best Closet Yet Produced for Either Public Places or Private Houses.



In presenting this Water Closet Apparatus to Architects and Plumbers and those interested in Sanitary Plumbing, will say that our aim has been to **Improve the Quality, Simplify the Construction and Reduce the Cost of Fitting in Place,** and we feel confident that we have done all this in the present Apparatus, and more too, **as it will discharge more matter, keep cleaner with less water and make less noise in the operation** than any Water Closet Apparatus now on the market.

The Closet is especially well adapted for Fire Proof Structures, as the Soil Pipe may be run above the floor, either behind or on the face of the finish. Another very good feature—stoppage can only take place in the bowl (where it can be reached from the top). Anything that passes this point will not lodge in the Soil Pipe.

These Closets are made of Vitreous Earthen Ware—that is, an absolutely non-absorbing material, warranted not to craze. Each Closet is stamped with a Bull's Head, our trade-mark.

The tank is provided with a cover finished to match. This cover deadens the noise, prevents fouling by dust and also prevents malicious persons from getting at or throwing anything into the tank.

The tank is worked either by hand action or seat action.

The distance from top of tank to finish of floor is 2 feet 6½ inches. From face of wall to front of Closet, 2 feet 1¾ inches. Depth of seal in Closet 2¾ inches.

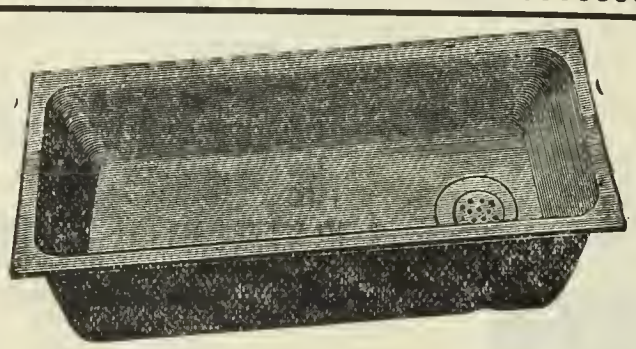
SEND FOR CATALOGUE.

MANUFACTURED BY

DALTON-INGERSOLL COMPANY

169-175 High St. & 55-61 Purchase St. (Ft. Hill Square),

BOSTON, MASS.



Columbus AND NEW Era

Wrought .· Steel .· Sinks.



Both good, either the best. Cannot, will not break. In the end cheapest.

The Kilbourne & Jacobs Man'fg Co.,

Columbus, Ohio, U. S. A. **Mfrs., write for Prices and Discounts.**

Look Here, Tinners, Roofers AND Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

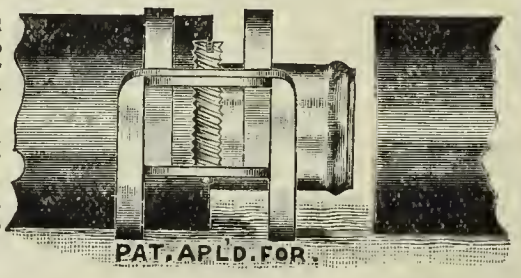
No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.
Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screwdriver being al the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust Sold by Jobbers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.

D. SAUNDERS' SONS.

MANUFACTURERS OF PATENT



STOCKS AND DIES.

Threading pipe ⅛ inch to 6 inch; the larger sizes have **CUTTING-OFF** attachment. These tools are light, strong and of superior design and finish; also **PIPE** threading **MACHINES** ¼ inch to 16 inch hand or power. Send for catalogue to

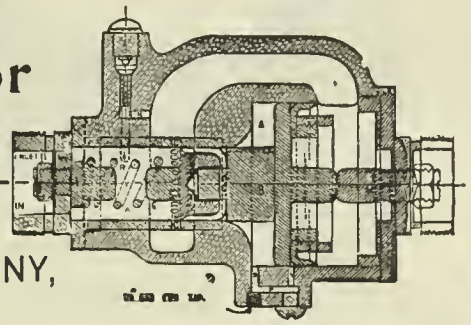
27 ATHERTON ST., YONKERS, N. Y.

W. G. Taafel's

Pressure Regulator

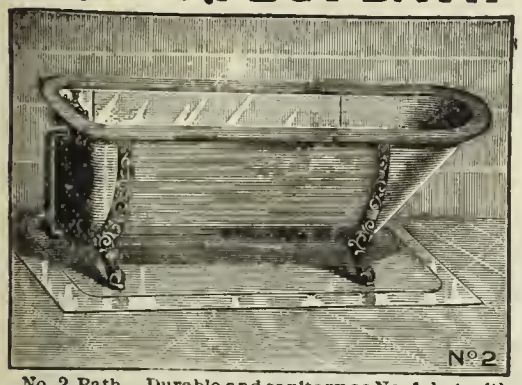
PATENTED.

Send for Circulars, Price-Lists and Conditions for Placing.



NEWARK REGULATOR COMPANY,
Newark. Ohio.

The PERFECT BATH.



No. 2 Bath. Durable and sanitary as No. 1, but with less variety.

INDESTRUCTIBLE

THE STEEL CLAD BATH.

INEXPENSIVE.

Common sense demands a sanitary bath, economy an inexpensive one, good taste one which can be decorated to harmonize with its surroundings. The **Steel Clad Bath** (copper lined) offers these advantages. It is also durable, and has, if desired, connected overflow and waste pipe. All metal except rim. No wood to harbor vermin or disease. Don't buy an imitation—get the **Steel Clad.** Send for catalogue.

For sale by all jobbers and plumbers and the

STEEL CLAD BATH CO. OF NEW YORK,
447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,
Detroit, Mich.
GEORGE BOOTH, President.

CLIMAX AUTOMATIC CELLAR DRAINER.

A Cheap, Reliable Remedy.

Never Failing.



It lifts water from Cellars, Wheel Pits, etc. and carries it into the street or sewer.

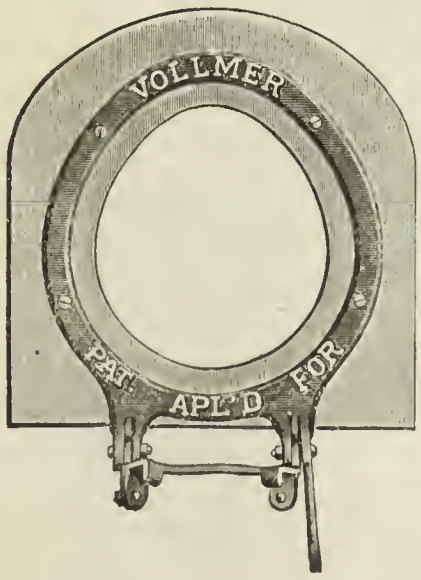
Requires no attention.

The Climax Gas Machine and Mixer stands at the head; makes brilliant, smokeless, steady and very cheap gas for stores, churches, etc.

WRITE FOR PAMPHLET.

C. M. KEMP MFG. CO.,
Baltimore, Md.

Vollmer Closet Seat.



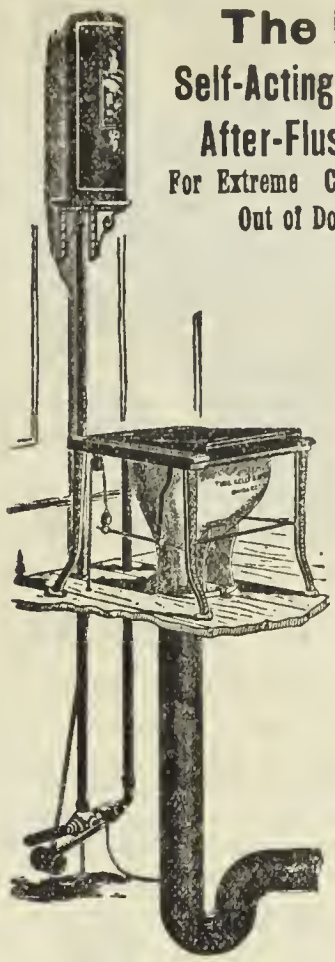
Can be attached to any Philadelphia Hopper by adjusting 2 set screws.

SEND FOR CATALOGUE.

ZERO VALVE CO.,
212 Seneca Street, - BUFFALO, N. Y.

The Kelly Self-Acting Frost-Proof After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

—SEND FOR CATALOGUE.—

Thomas Kelly & Bro.,
124 Franklin St., Chicago,
Manufacturers of Permanent Plumbing Goods.

DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.



The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discounts

MADE BY

THE DAY MFG. CO.
Detroit, Mich., U. S. A.



BERGERS STAR BUCKET EARS

SEND FOR SAMPLE AND FULL ILLUST. CATALOGUE

L.D BERGER
MANUFR OF
TINNERS HARDWARE AND SUPPLIES.
59 N. 2d STREET, - PHILADELPHIA, PA.

Leather and Rubber

WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

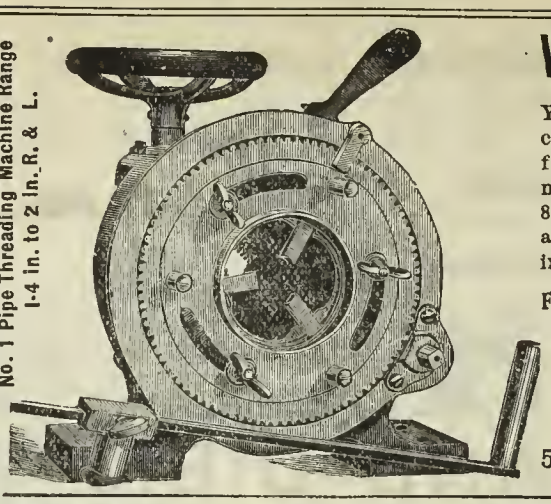
I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

— "Can you not read my thoughts[?]" They were near the cold, gray ocean with its eternal pulsations.

His ardent glance rested upon her glorious face.

"No," she answered quietly; "I do not care for light reading."—*Puck.*





When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.

W. & B. DOUGLAS,



Middletown, Conn.

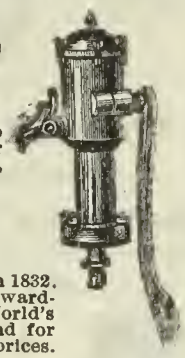
Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON
156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS

GREATEST IMPROVEMENT OF THE AGE.

Simple, durable, powerful, easy to operate never affected by frost. Patent GLASS VALVE, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.

THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.
Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

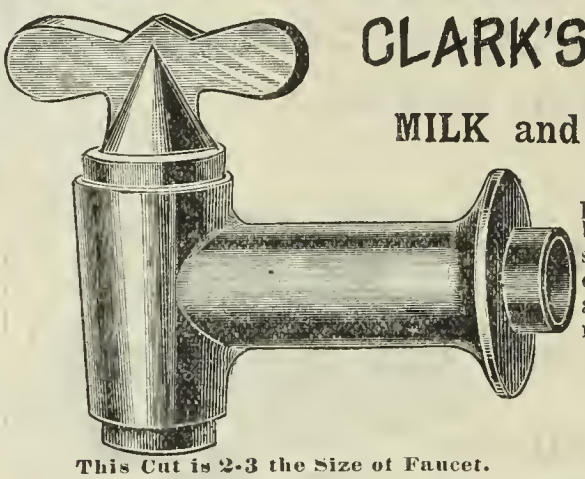
MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

6-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; AOME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.



This Cut is 2-3 the Size of Faucet.

CLARK'S NEW FAUCET

— FOR —

MILK and CREAM CANS, ETC.

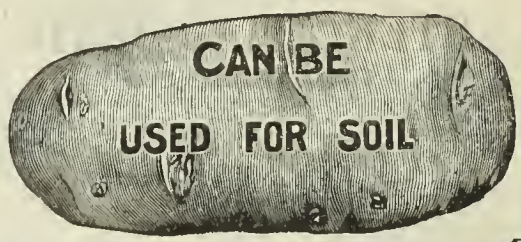
Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.

A RAW POTATO



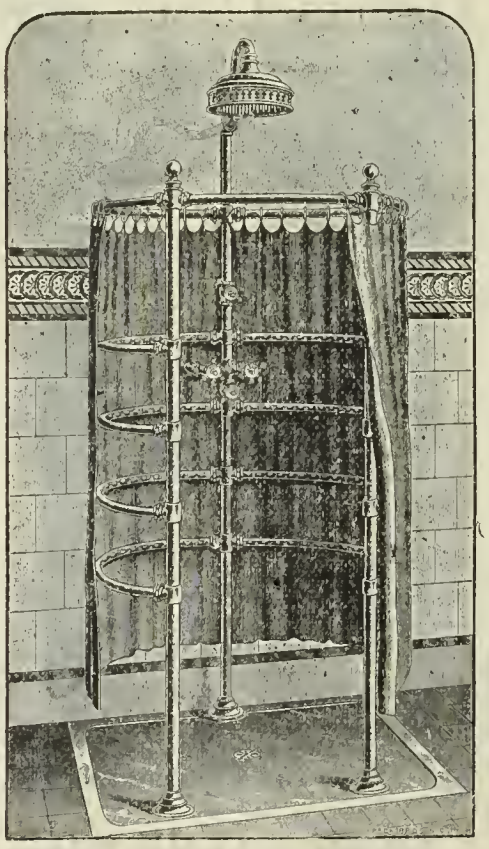
Up to Date Plumbers Use

Bailey-Farrell Mfg. Co.'s Prepared Soil and S. S. S. Solder.

Special Price for Trial Lots.

Pittsburgh, Pa.





47 Cliff St., NEW YORK.
259 Wabash Ave., CHICAGO.

Peck Bros. & Co.,

MAKERS OF

Fine Sanitary Brass Work and Sanitary Fixtures of only Highest Grade.

HAVE YOU OUR CATALOGUE.

This reduced cut, Fig. 218, is only one of hundreds of others

127 Chestnut St., NEW HAVEN, CT.
65 Oliver St., BOSTON.

Don't Buy

*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

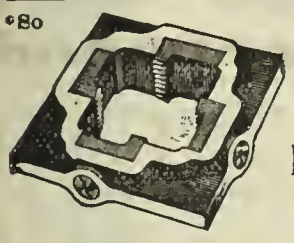
Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;

Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**

Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence** of quality.

If by chance you do not think these points, or the saving of money, objectionable,

*80



Send us a **Postal Note for 62 Cents** (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, PA., U. S. A.
SEND FOR CATALOGUE OF THE "SKELETON" PIPE DIE

SIMS'S ADJUSTABLE EAVE TROUGH.



Pat. Jan. 14th, 1890.

Various Designs of Galvanized Sheet Steel Eave Troughs, Mitres, and Ridge Rolls, Roof Gutters, Expanding Conductors, Elbows, etc., etc.

THE SIMS MFG. CO, Sole Manufacturers, **NEWARK, OHIO.**

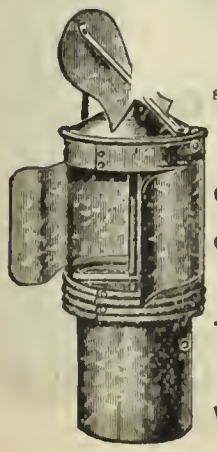


BERGER BROS.,

TINNERS' HARDWARE, ROOFERS' SUPPLIES,
231 AND 237 ARCH STREET, PHILADELPHIA.
GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS.
LARGEST STOCK, GREATEST VARIETY, PROMPT SHIPMENTS.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Rods, Elbows, Ears, Handles, Valves and Plungers, etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.



REVOLVING CHIMNEY CAPS,

Galvanized Iron.

These Caps revolve on heavy glass bearings, and are made from No. 26 iron. All sizes; cheapest and best.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted Leader, cheapest and best in the market. Sheet Iron Piping, Stove Pipe and Fittings of every description.

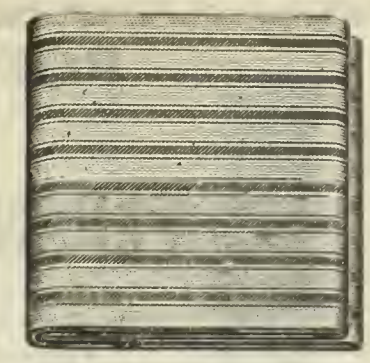
GENERAL GALVANIZING TO ORDER.

THE JERSEY CITY GALVANIZING CO., Manufacturers and Jobbers in

GALVANIZED MATERIAL OF EVERY DESCRIPTION.

Works, Jersey City. **Store, 112 John St., New York.**

SEND FOR CATALOGUE.



It requires considerable skill to make a good wiped joint—considerable skill, also, to make a proper **Wiping Cloth.** And while one cannot manufacture a wiped joint, we can and do make and sell a perfect **Cloth.**

One that will outwear two of the ordinary kind.

One that you can buy cheaper than you can make.

Send us 12 cents for a sample (any size; for any kind of a joint) and see if the "Columbia" Wiping Cloth is not a model of its kind, then send 62 cents for six of any size by mail. See that each one is stamped "Columbia."

THE

J. W. Chamberlain Co.,

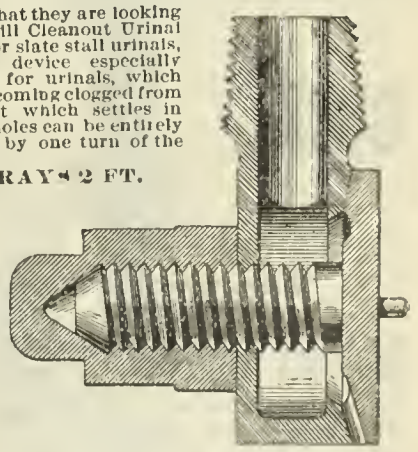
Plumbing and Steam Fitting Specialties,

BANGOR, - - MAINE.

Plumbers, Builders, Architects!

Just what they are looking for. Savill Cleanout Urinal Spray for slate stall urinals, a new device especially adapted for urinals, which upon becoming clogged from sediment which settles in tits or holes can be entirely cleaned by one turn of the nut.

SPRAYS 2 FT.



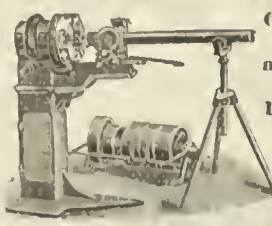
(Patent applied for.)

FOR SALE BY

SAVILL, WALLS & CO.,

Dealers in Plumbers' Supplies,
1229 and 1231 Budden Street, - PHILADELPHIA.
Write for circulars.

PIPE THREADING AND CUTTING OFF MACHINES.



WATER, GAS and STEAM FITTERS' TOOLS.
Improved Hinged Vises,
Pipe Wrenches,
Stocks and Dies.
Acknowledged to be the Best.

ARMSTRONG MFG. CO.,
N. Y. OFFICE: 139 Centre St.
Bridgeport, Conn.

POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**





W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.





BROUGHTON'S

Patent

Self-Closing



CAN BASIN COCK.

NOT BE TIED OPEN.

Every One Warranted.

Stebbins Mfg. Co., BRIGHTWOOD, MASS.,

SOLE MANUFACTURERS.

If you want the best

Eave Trough,

Conductor Pipe, etc.,

Write us at once and get our prices. We can save you money, as well as furnish you with superior goods manufactured on new and greatly improved machinery——Address

The Kanneberg Roofing Co.,

Canton Ohio



Corrugated Expanding Conductor

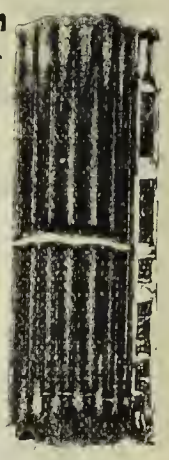
OF GALVANIZED IRON AND COLD ROLLED COPPER.



JAMES A. MILLER & BRO.,

129 and 131 South Clinton St.,

CHICAGO.



EAVES TROUGH HANGERS.

PROUDMAN BROS.,

MERIDEN, CONN.



CHUCKS The National

All sizes and styles. Patented

Reversible Jaws. Illus. catalogue.

The standard Chuck since 1882.

Address W. WHITLOCK,

39 Cortlandt Street, New York.



USE "OUR OWN" BASIN PLUGS.

No other lettering on them.

SAMPLE DOZEN ASSORTED $1.

HANDSOMELY NICKELED. BEST QUALITY STOCK

H. O. CANFIELD

MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.



BOWERS, GALPIN & CO.



Standing Seam and Roll Roofing.
Painted Steel, Terne and Galvanized.

—MANUFACTURED BY—

BOWERS, GALPIN & CO., Binghamton, N. Y.





STYLE S.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.





THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR

MANUFACTURED BY THE

S. S. S. CONDUCTOR CO.,

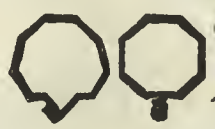
LIMITED

168 Lacock Street,

ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

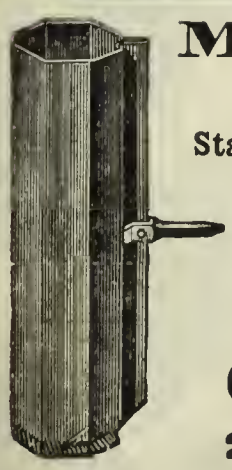


Made in 6-foot lengths of a single sheet of SOFT STEEL.

Galvanized, Kalameined or Leaded.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.





MARLIN & CO.,



(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

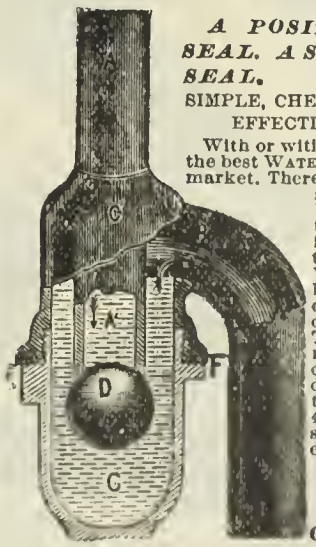
—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.

THE BOWER

SEWER GAS TRAP.



A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

SIMPLE, CHEAP.

EFFECTIVE and DURABLE.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 48-page pamphlet sent free on application.

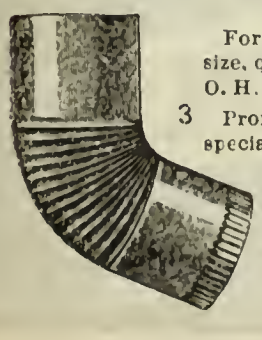
B. P. BOWER & CO.
Manufacturers,
Cleveland, Ohio

The "O.H." One Piece

PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

(PATENTED OCT. 25, 1892.)

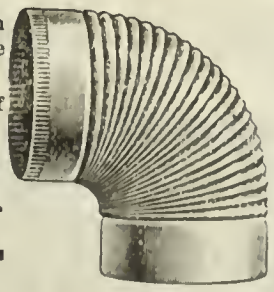


For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.

For Sale by all First-class Jobbers.



THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 30th Street, NEW YORK.

LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order.

PATENTED

LONGEST EAVE TROUGH IN THE WORLD 10 FT. WITHOUT A SEAM

PRESSED STEEL BRICK

COMPLETE GALVANIZED

STEEL FRONTS

ROCK FACE BRICK AND STONE

CONDUCTOR

CORRUGATED IRON

NO SIR! YOU CAN'T SELL ME YOUR ROOFING! I AM USEING BERGER'S PATENT, IT IS THE BEST IN THE MARKET, AND YOU KNOW IT."

BERGER'S PATENT ROOFING

CRIMPED IRON

PLAIN ROUND

FIRE PROOF DOORS & SHUTTERS

METALLIC SHINGLES

CONDUCTOR

EXPANDING

PATENT CEILINGS

25 STYLES

CORNICES AND FINIALS

PERFECTION WATER CUT-OFF

PERFECTION WIRE HANGER

IMPERIAL STEEL HANGER

SKYLIGHTS

ALL STYLES

132 PAGE Catalogue ON APPLICATION.

WRITE FOR PRICES IT WILL PAY YOU.

THE BERGER MFG. CO. CANTON, O.

IRON AWNINGS, ROOF PAINTS, WEATHER VANES, VENTILATORS, MALLEABLE IRON CRESTINGS, etc.

WESTERN AGENTS: ILLINOIS ROOFING & SUPPLY CO. CHICAGO, ILL.

SPECIALTIES.

BRIGHT TIN PLATE.
CUMMEY'S ANTI-PINHOLE.

TERNE PLATE.
ALDERLY EXTRA QUALITY.
PENNSYL OLD METHOD, Treble Coated.
GILBERTSON'S OLD METHOD, Treble Coated.

Sheet Copper.—Brazier's Cold Rolled & Polished.

CRAIG SHEET STEEL.

COLD ROLLED SHEET IRON.
" " " SOFT STEEL.

CORRUGATED IRON.
" CONDUCTOR PIPE.

SPIRAL PIPE. REGISTERS.

ROOFING PAPER, No. 9.— 500 Square Feet per Roll.
" " No. 13.— 800 Square Feet per Roll.

ROOFING PAINT.
" TIN IN ROLLS.
100 Square Feet.
20 in. and 28 in. Wide.
Painted One Side.

ASBESTOS FIRE PROOF SHEATHING PAPER.

PECORA ROOFING CEMENT.

PLASTERING WIRE.

GUMMEY, SPERING & CO.,
PHILADELPHIA.

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD
Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,
535 to 547 West 15th Street, New York.

NEW CASTLE
AMERICAN
BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works
direct from
LAKE SUPERIOR ORES.

Equal to the "Best in the World,"
If you don't believe it send for samples.

New Castle Steel and Tin Plate Co., New Castle, Pa.

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.

AMERICAN SHEET IRON COMPANY,
—MANUFACTURERS OF—
SHEET IRON AND SHEET STEEL,
Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

PHILLIPS' ROOFING. EXTRA HEAVY COATED. Guaranteed 35 Pound Coating.
"BOSTON" ROOFING. HEAVY SPANGLED TERNE. Guaranteed 20 Pound Coating.
NATIONAL (Dark) TERNES. (WORCESTER GRADE.) Guaranteed 10 Pound Coating.

THE PHILLIPS TIN PLATE CO., Philadelphia.
SEND FOR SAMPLE AND NEW TARIFF PRICES.

MAPLE SYRUP CAN and SAP BUCKET STOCK.

We are now prepared to quote for December and January shipment.

M. & L. A. OSBORN, - - - CLEVELAND O.

—EXPERIMENTAL.—Freddy (day before Christmas): "Santa Claus is going to have some trouble coming down our chimney."

Johnnie: "How is that?"

Freddy: "I went up to the roof yesterday and put a stray cat in the chimney, and she hasn't come down yet."—*Harper's Young People.*

PHELPS, DODGE & CO.,

11 Cliff St., N. Y.

Tin Plate, Pig Tin, Sheet Iron, Sheet Zinc, &c.

PHELPS' TREBLE COATED ROOFING.

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade:

TIN AND IRON SHOW CARDS.

110 John St., - New York.

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.



ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.

Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

MONARCH OLD PROCESS

Has been on the market for ten years and has never varied from its high standard of quality

P. B. CALVERT & CO.,

Write for Prices. Philadelphia, Pa.

JOHN DUNLAP COMPANY'S

SPECIAL BRAND ROOFING PLATES.

SUPERIOR GRADE.

I DUNLAP'S DOUBLE IPPED C

Or I X.

PALM OIL PROCESS.

EVERY BOX GUARANTEED. PITTSBURGH, PA.

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. BRIDGEPORT, OHIO.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

— WAS A REVELATION.—Fair visitor: "So you have really decided not to sell your house?"

Fair host: "Yes. You see we placed the matter in the hands of a real estate agent. After reading his lovely advertisment of our property neither John nor myself could think of parting with such a wonderful and perfect home."—*New York Herald.*

— "I NEVER get angry with a fool," was the cutting remark of a man who wanted to crush a rival.

"That accounts for your always being on such good terms with yourself," was the reply.—*London Tit Bits.*

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices.

Brooklyn, N. Y.

BLINN'S

TIN, SHEET-IRON and COPPER-PLATE WORKER,

A New, Revised and Enlarged Edition, from New Type, with New Engravings.

One of the Most Popular Technical Books ever published in the United States.

A PRACTICAL WORKSHOP COMPANION

—FOR—

TIN, SHEET-IRON

—AND—

COPPER-PLATE WORKERS.

Containing rules for describing various kinds of Patterns used by Tin Sheet-Iron and Copper-Plate Workers. Practical Geometry. Mensuration of Surfaces and Solids; Tables of the Weights and Strengths of Metals and other Materials; Tables of Areas and Circumferences of Circles; Composition of Metallic Alloys and Solders, with numerous valuable Receipts and Manipulations for every-day use in the workshop. By Leroy J. Blinn, Master Mechanic. A new, revised and enlarged edition, printed from new type, and with 170 newly engraved illustrations.

In one volume, 12mo, 296 pages, price $2.50, free of postage to any address in the world.

☞ It having been found necessary to make a new set of electrotype plates and new engravings of this most popular book—the old ones having been worn out by actual use—it was determined to have the book re-edited and to add to it, in the different departments, new, recent and necessary matter. All of the old illustrations of patterns have been retained, and new ones have been added. The portion treating of metallic alloys and solders has been entirely re-written, so as to have a more systematic arrangement, and to bring it abreast with the best modern practice in this interesting and important field. In all the other departments new matter has been added, every effort having been made to render the entire work, in the future, if possible, even more useful to the tin, sheet-iron and copper-plate worker than in the past.

ABSTRACT OF CONTENTS.

Rules for Describing Patterns; Practical Geometry; Mensuration of Surfaces; Mensuration of Solids, and Capacities of Bodies; Tables of Weights, &c.; Tables of the Circumference of Circles and of the Areas of Circles; Rules for Rendering the Tables Useful; Sizes of Tinware; Capacity of Cylinders, and various other Useful Tables and Information; Practical Receipts Varnishes, Lacquers, Cements, Metallic Alloys, Miscellaneous Receipts; Strength of Materials, with Tables Index.

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher & Bookseller

96-102 Reade Street, New York.

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

—MANUFACTURERS OF—

SHEET METAL ROOFING, SIDING AND CEILING

—OF ALL DESCRIPTIONS FROM—

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.

Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.

Factory, 113 to 133 Soulard Street, ST. LOUIS, MO.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size. CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. LITTLEFORD BROS., SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O

Buy Plain and Corrugated Conductors and Single and Double Beaded Eave Troughs, all in 10 ft. lengths; also Brick Siding, Corrugated Roofing, Cornices, &c., of

ALLEN'S CORRUGATING WORKS,

422 and 424 W. Randolph St., CHICAGO, ILL.

You can get everything in the line of Sheet Metal Goods from us.

PRICES WAY DOWN.

Steel Roofing, Corrugated Iron.

Galvanized Steel Eave Trough, Corrugated Expanding Conductor, Galvanized Cornice, Ornamental Crestings, Finials, Etc.

DOWN! DOWN! GO PRICES. WRITE US QUICK.

J. H. ELLER & CO., Office, 194 E. Fifth St., CANTON, OHIO.

Bright Charcoal Tin Plates.

Coke Tin Plates.

A Full Assortment of Sizes.

ALSO

20 x 28 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.		
IC	CLYRO—Old Way, Stamped and Squared.		
IC	M F Stamped and Squared.		
IC	PONTYMISTER—Old Style, Stamped and Squared.		
IC	KILLEY—Extra Coated, Stamped and Squared.		
IC	L P L—Extra Coated, Stamped and Squared.		
IC	LILY—Stamped and Squared.		
IC	DYFFRYN.	200 lbs.	PETREL.
IC	WORCESTER.	IC	ALYN.
200 lbs.	WORCESTER.	IC	BAAN.
IC	W T R—Stamped.	IC	MANSEL.
200 lbs.	W T R.	IC	ALBAN.
IC	P T L.	200 lbs.	ALBAN.
IC	DEAN	190 lbs.	ALBAN.
200 lbs.	DEAN.	200 lbs.	CAWDOR.
IC	PETREL.	190 lbs.	CAWDOR.

14 x 20 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.		
IC	CLYRO—Old Way, Stamped and Squared.		
IC	M F—Stamped and Squared.		
IC	PONTYMISTER—Old Style, Stamped and Squared.		
IC	KILLEY—Extra Coated, Stamped and Squared.		
IC	L P L—Extra Coated, Stamped and Squared.		
IC	W T R—Stamped.		
100 lbs.	W T R.		
IC	P T L.		
IC	DEAN.		
100 lbs.	DEAN.		
IC	PETREL.		
100 lbs.	PETREL.		
100 lbs.	CAWDOR.		
IC	BAAN.		

WASTER ROOFING.

ICW	20x28	GWERNEN.	
ICW	"	W T R.	
200 lbs. W	"	ALBAN.	
190 lbs. W	"	ALBAN.	
180 lbs. W	"	DYFFRYN.	

SOLDER—The reduction in Pig Tin has made prices much lower.

RUSSIA SHEET IRON (Genuine)—The duty has been reduced, and prices are lower than last year. No. 8 to No. 16 inclusive, sheets 28x56 inches.

BRUCE & COOK,

190 Water St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

Standard Books

—ON—

FOUNDRY PRACTICE.

The Encyclopedia of Founding and Dictionary of Foundry Terms,

used in the practice of molding. Together with a description of the tools, mechanical appliances, materials, and methods employed to produce castings in all the useful metals and their alloys. including brass, bronze, steel, bell, iron and type founding, with many original mixtures of recognized value in the mechanic arts. Also aluminum, plating, gilding, silvering, dipping, lacquering, staining, bronzing, tinning, galvanizing, britannia-ware, German silver, nickel, soldering, brazing, ores, smelting, refining, assaying, etc. By SIMPSON BOLLAND, Author of "The Iron Founder," "The Iron Founder" Supplement. 12mo.: cloth.....**$3.00**

The Pattern Maker's Assistant

Embracing lathe work, branch work, core work, sweep work and practical gear constructions, the preparation and use of tools, together with a large collection of useful and valuable tables. Sixth edition. By JOSHUA ROSE, M. E.; illustrated with 250 engravings; 324 pages: cloth.....**$2.50**

Modern Molding and Pattern Making.

A practical treatise upon pattern shop and foundry work. By JOSEPH P. MULLIN, M.E.: 257 pages; cloth; illustrated. **$2.50**

Iron and Steel Founding.

Illustrated with 39 diagrams. By C. WYLIE. Second edition, revised and enlarged; 324 pages; 8vo; cloth... .....**$2**

The Practical Brass and Iron Founder's Guide.

A treatise on brass founding, molding, the metals and their alloys, etc. By JAMES LARKIN, late conductor of the brass foundry department in the Penn Works, Philadelphia. A new revised and greatly enlarged edition. Contents: Among the most important and entirely new sections of this edition of this valuable and popular book are the following: Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to Other Metals; Casting Iron and Other Metals Upon Lace, Embroideries, Fern Leaves and Other Combustible Materials; Some Modern Bronzes. In one volume; 12mo; 400 pages.....**$2.50**

American Foundry Practice.

Treating of loam, dry sand and green sand molding, and containing a practical treatise upon the management of cupolas and the melting of iron. By THOMAS D. WEST, practical iron molder and foundry foreman. Fully illustrated. Eighth edition, revised. 408 pages; cloth.....**$2 50**

The Iron Founder.

A comprehensive treatise on the art of molding, including chapters on core-making, loam, dry sand and green sand molding, also crystallization, shrinkage and contraction of cast iron and a full explanation of the science of pressures in molds, added to which are formulas for mixtures of iron, tables, rules and miscellaneous information. By SIMPSON BOLLAND. Illustrated with over 300 engravings. 12mo, cloth....**$2.50**

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings, wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. Illustrated with over 200 engravings; 400 pages; 12mo: cloth..... ...**$2.50**

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96-102 Reade St., - New York.

IS IT RIGHT?

Is it right to presume that the metal workers of America do not know the difference between common galvanized iron and good galvanized iron? We don't think so.

Would it be right to take advantage of that ignorance, even if it did exist? We don't think so.

Is it wise to conduct a business on that sort of a basis? We don't think so.

Taking advantage of other people's lack of expert knowledge is mighty poor business. Very few of us but have to take other people's words for things we are not wholly familiar with. Are we "fair game" for imposition because we depend on other folks' honesty? As a matter of fact, metal workers do know the difference between poor iron and good iron. They may be imposed upon once in a while because they believe in the dealer's honesty and do not watch him, but sooner or later they will find out the imposition, and then the dealer will be sure to lose their trade forever.

A dealer or manufacturer who sells inferior goods on the representation or with the understanding that they are first-class, is not a safe man to deal with. If he will sell a single sheet of iron that way, look out for him on a car load.

When we sell "Star Best Bloom," we guarantee it perfectly flat, full weight without variation, and absolutely true to gauge. It's the best grade of galvanized sheets we know how to procure. Doubtless, unscrupulous persons can occasionally sell inferior sheets at the price of the "Star." Doubtless they would make a little bigger profit on that one sale, but the big profits that result in lost trade are not so very profitable after all.

For a certainty of quality and an absolute guarantee of grades, address

MERCHANT & CO., Inc.,

PHILADELPHIA, CHICAGO, NEW YORK, BROOKLYN.

Hicks' Guide
FOR
Builders,

Comprising an easy, practical system of Estimating Materials and Labor for Carpenters, Contractors and Builders.

A comprehensive guide to those engaged in the various branches of the building trades.

By I. P. HICKS.

160 Pages, - 114 Illustrations.

Bound in Cloth, Price, - $1.00

This book presents to the trade, first, an easy, practical system of estimating materials, in concise form for reference. In the next place is given the average day's work of all kinds, and the average rates on which to figure in almost every detail of building construction.

Material and Labor, including Lumber, Carpentry Work Masonry, Plastering, Hardware, Painting, etc., are among the principal divisions. These in turn are illustrated and ably treated under numerous sub-divisions, showing step by step the entire work of estimating, contracting and building, together with the best and most practical methods of doing the work.

This is followed by a section given to the Geometrical Measurements of Roof Surfaces with numerous illustrations and examples. It embraces a new and simple system of framing curved roofs, also the simplest methods of roof framing of every description, with practical examples thoroughly illustrating nearly every conceivable form of roof and showing many points never before presented.

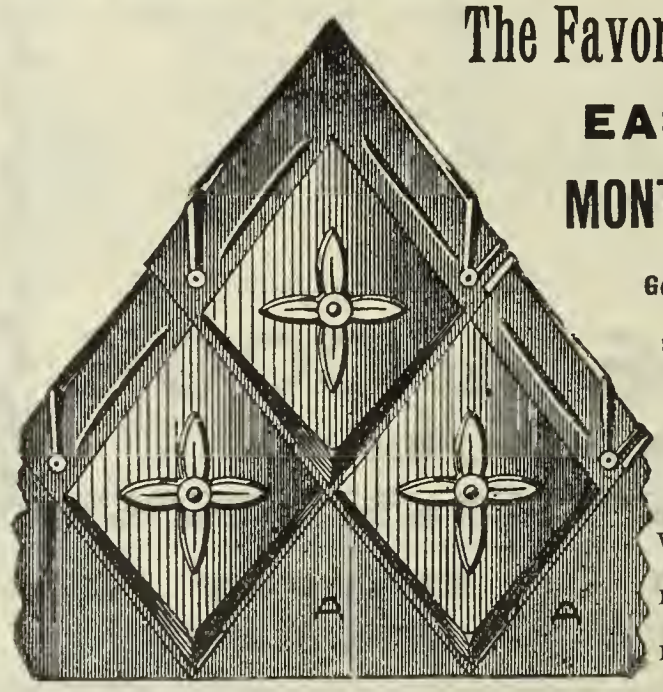
The volume also contains a chapter on Mitering Planceers, Moldings, etc., illustrating and describing how to make, in an easy, practical manner, many joints which are the source of no little trouble and annoyance on the part of the workman.

SENT POST-PAID BY

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade St., N. Y.

The Favorite Metal Shingle



EASTLAKE.

MONTROSS PATENT.

Gothic and Diamond Tile.

Unequaled for beauty and excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit, Mich.

MONTROSS METAL SHINGLE CO., Camden, N. J.

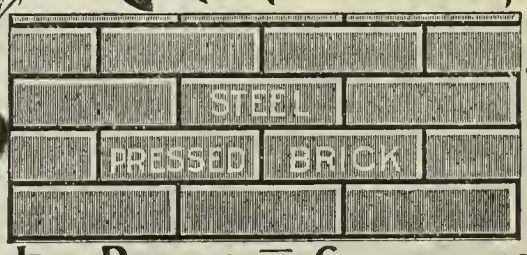
E. VAN NOORDEN & CO., Boston, Mass.

BEWARE!
OF INFRINGMENTS.

CLUSTER STEEL SHINGLES
ROLL STEEL ROOFING

FOR Catalogue, Samples and Prices.

..Purchase only the.. Genuine Pressed Steel Brick

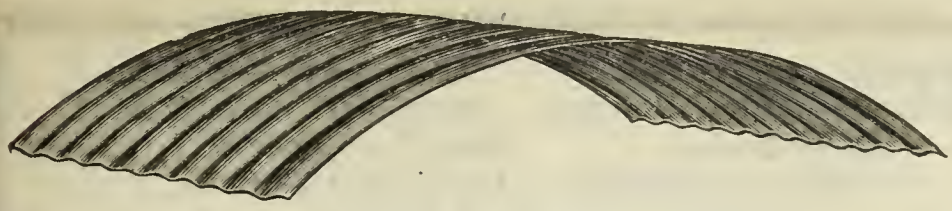


PATENTED APRIL 5th 1887.

Corrugated Steel CEILINGS

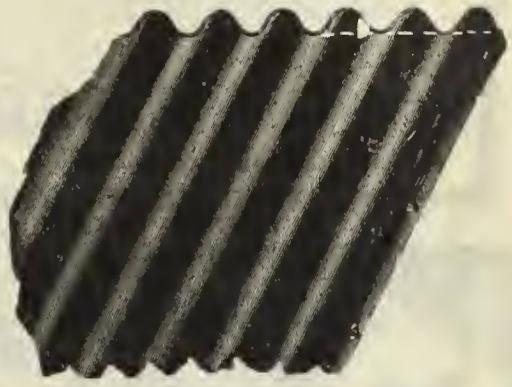
THE PENN IRON ROOFING AND CORRUGATING Co LIMITED.

23rd & HAMILTON Sts PHIL'A, PA. U.S.A.



Curved and Corrugated

Sheets for Structural Purposes



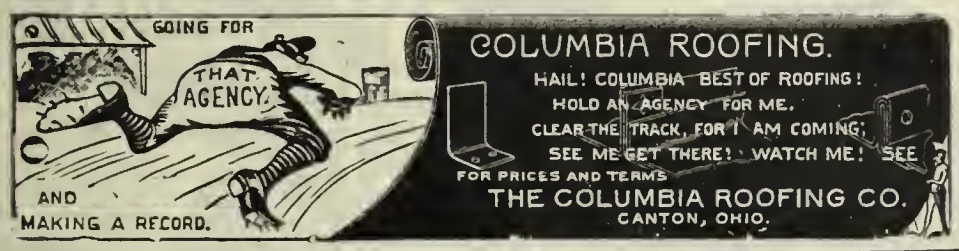
Any size and dimension, ready for placing in position without trimming. Lightness, strength and durability insured at a minimum cost.

Such as
Houses,
Barns,
Factories,
Warehouses,
Granaries,
Sheds, Etc.

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.





BANGOR EXCELSIOR SLATE COMPANY

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, . . EASTON, PA.

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC.

QUARRIES, BANGOR, PA.

NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE Kitchen Sinks, Laundry Tubs, Washstand Tops, Marbleized Shelves, Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also Mantels.

FAIRHAVEN, VERMONT

SEND FOR CATALOGUE.

RISING & NELSON,

WEST PAWLET, VT.

MANUFACTURERS OF

RED and GREEN ROOFING SLATE.

Wholesale Dealers in all kinds of Roofing Slate.

CORRESPONDENCE SOLICITED.

At this time of the Year

metal workers are busy fixing furnaces, steam pipes, etc. Dixon's Graphite Pipe Joint Grease will make a better joint than red or white lead and parts can be separated easily even years after. When used on valves it does not harden or cause the valves to stick. Send for circular and sample.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York.

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds.

THE ROOT & BARRON ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer.

PALMYRA, NEW YORK.

JOHN D. EMACK,

Roofing Slate,

SLATE BLACK-BOARDS.

Betz Building, Philadelphia, Pa.

JOHN SANBORN,

Dealer in Metals,

and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead

217 WATER STREET,

Near Beekman Street, NEW YORK

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.

AMERICAN ROOFING CO.,

Mention this paper. **ST. LOUIS and CINCINNATI.**



The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S.

FIRST & WASHINGTON STS. JERSEY CITY, N.J.

James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

MANUFACTURERS.

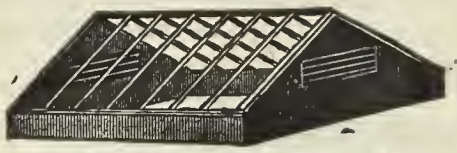
CORRUGATED

FOR

ROOFING AND SIDING.

Send for Circular and Prices.

RASNER & DINGER

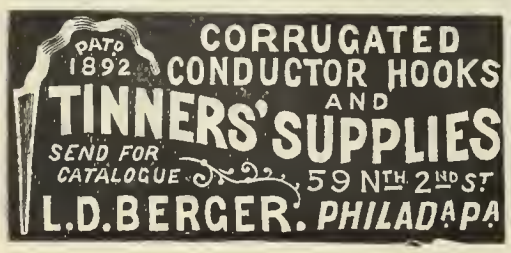


Manufacturers of **HAYES' PATENT**

Metallic Sky-Lights,

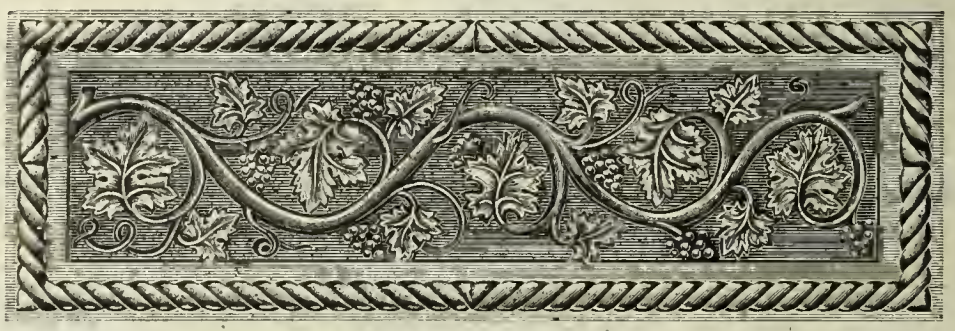
Galvanized Iron Cornices and all kinds of Architectural Sheet Metal Work, Tin and Iron Roofers.

Second Ave. & Ferry St., Pittsburgh, Pa



Friedley & Voshardt,

194 and 196 Mather St., Chicago, Ill.,



MANUFACTURERS OF

Sheet Metal, Zinc and Copper Ornaments

For Interior and Exterior Work, Steel Ceilings, Statuary, &c.

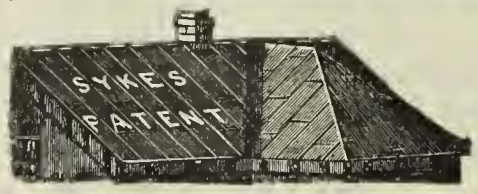
Send for our new 1894 Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.

HOLTON IRON ROOFING C

ROOFING, SIDING, CEILING &C. NEW LISBON, O.

AGENTS WANTED EVERYWHERE



WORLD'S FAIR AWARD.

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

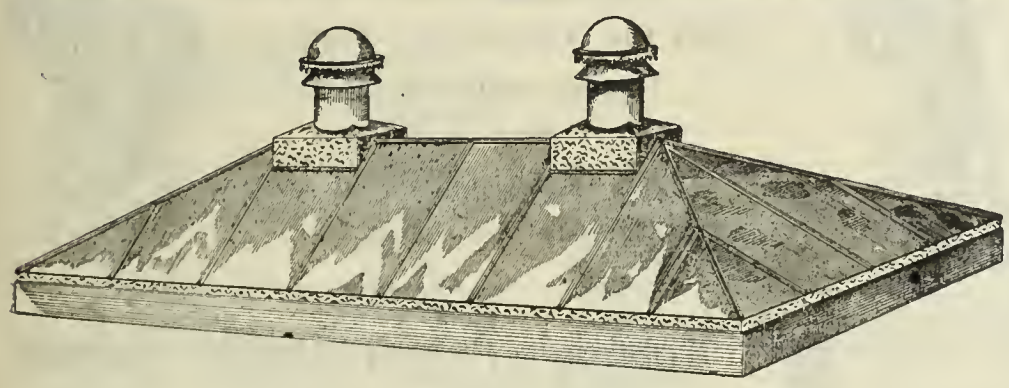
Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.





Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.

POWERS & BOYD

Galvanized Iron Cornice and Roofing Co.,

ST. LOUIS, MO.

Manufacturers of Copper and Galvanized Iron Cornices and Sheet Metal Trimmings or buildings. ESTIMATES FURNISHED ON APPLICATION.

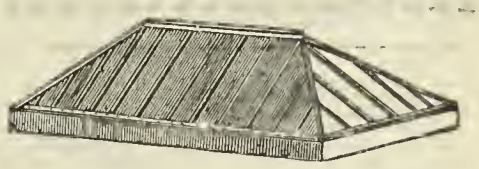
JAMES A. MILLER & BRO.

129 and 131 So. Clinton St.,

CHICAGO.

MANUFACTURERS OF

Sheet Metal Skylights.



The amount of skylight work we did for the World's Fair (over 600,000 sq. ft.) required us to so increase our facilities for such work that we have cheapened the cost materially, and we will be particularly pleased to quote prices for large or small skylight work, "knocked down" or put together, as preferred.

CORTRIGHT METAL SLATES

and

VICTORIA SHINGLES

Made of

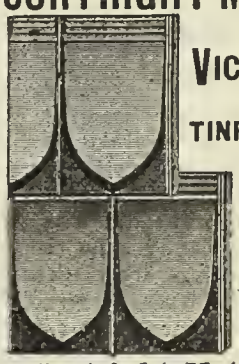
TINPLATE, (Full Weight Only)

Galvanized Steel

and

COPPER

Prices and Samples Free on Request.



Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.

Western Office, 134 Van Buren Street, Chicago.

Defy Fire and Time

WITH OUR

Steel Roofing,

Steel Ceilings, (Patented)

Corrugated Iron, Conductor Pipes,

Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,

Office and Works, Wheeling, W. Va.

Office and Warehouse, 474 Laflin St., Chicago.

Office and Warehouse, 81 Fulton St., New York.

DUGAN'S PATENT

SNOW GUARDS FOR SLATE AND OTHER SLANTING ROOFS

SEND FOR ILLUSTRATED CIRCULAR & PRICE LIST.

M. HALLIDAY,

SOLE PROPRIETOR AND MANUFACTURER.

218 EAST NINTH STREET, NEW YORK.

Architectural
Sheet Metal
Work.

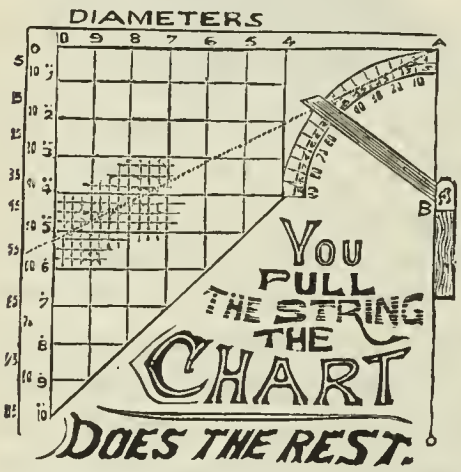
Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.

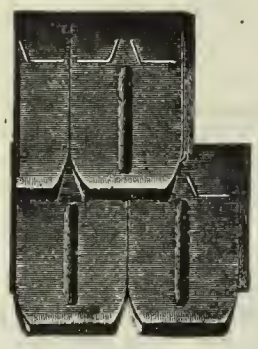


ELBOW PATTERN CHARTS.

Quick method. Easy to learn. Good to have. Over 1000 sold. 50c. hy mail.

A. L. BURTIS, Lockport, N. Y.

THORN'S PATENT METALLIC ROOFING



TILES AND SPRING-LOCK SHINGLES.

THE BEST, MOST HANDSOME, DURABLE AND SECURE ROOFING PLATES YET OFFERED TO THE BUILDING TRADE.

Indorsed by All the Leading Architects.

Our system differs from all others in existence. We keep a complete stock of *eight designs of tile and two sizes of shingles.* Our tiles are a marvel of beauty and have the most secure and most practical side-lock ever invented.

Send for illustrated catalogue and circular.

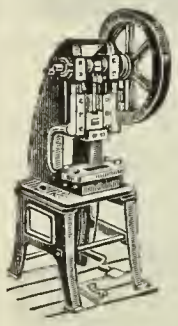
THORN SHINGLE & ORNAMENT CO.,

1227 Callowhill St., Philadelphia, Pa.

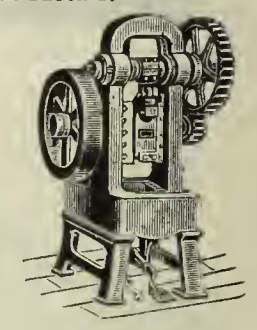
THE TOLEDO MACHINE & TOOL CO.,

MANUFACTURERS OF

Power Punching Presses, Drop Presses, Trimming Presses, Stamping Presses Riveting Presses, Embossing Presses, Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

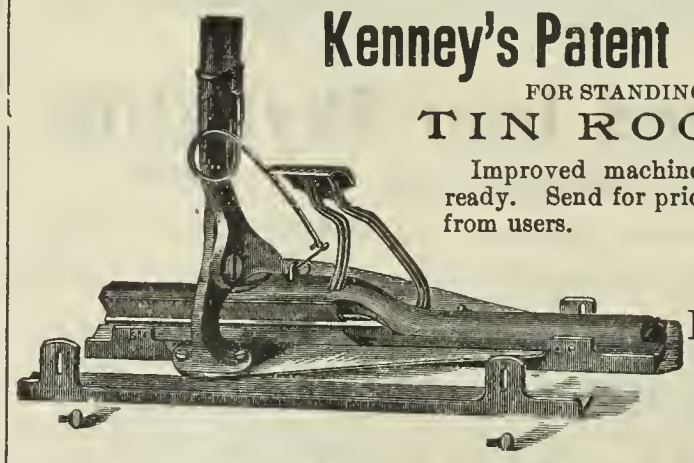


Send for Catalogue now being printed.



The Toledo Mach. and Tool Co.

Superior and Oak Sts.. Toledo, O.



Kenney's Patent Double Seamer

FOR STANDING LOCK

TIN ROOFING.

Improved machine, from new patterns, now ready. Send for prices and flattering testimonials from users.

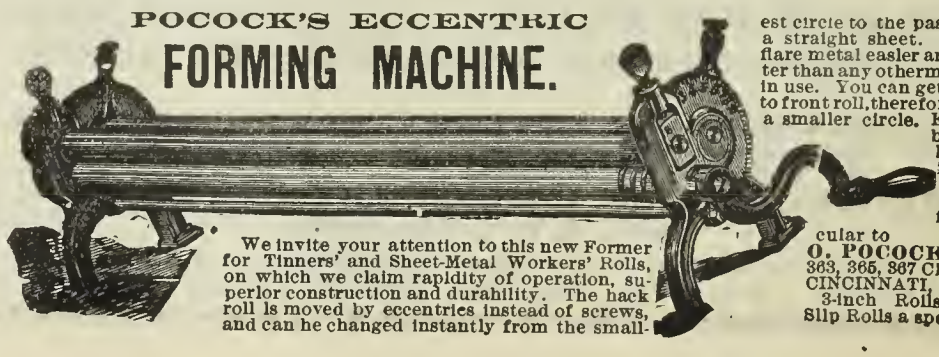
MANUFACTURED BY

Dwight Slate Machine Co.,

Hartford, Conn.

POCOCK'S ECCENTRIC

FORMING MACHINE.



We invite your attention to this new Former for Tinners' and Sheet-Metal Workers' Rolls, on which we claim rapidity of operation, superior construction and durability. The back roll is moved by eccentrics instead of screws, and can be changed instantly from the smallest circle to the passing of a straight sheet. It will flare metal easier and better than any other machine in use. You can get closer to front roll, therefore bend a smaller circle. For sale by all leading jobbers. Send for circular to

O. POCOCK, Mfr.
363, 365, 367 Clark St.
CINCINNATI, OHIO.

3-inch Rolls with Slip Rolls a specialty

The Tonquin Wood Mines.

The wood mines of Tonquin appear to constitute a curious source of wealth. The wood in these mines was originally a pine forest, which the earth swallowed in some cataclysm. Some of the trees are said to be a yard in diameter. They lie in a slanting direction and in sandy soils, which cover them to a depth of about 8 yards. As the top branches are well preserved, it is thought the geological convulsion which buried them cannot be of great antiquity. The wood furnished by these timber mines is imperishable, and the Chinese gladly buy it for the manufacture of coffins.—*Invention*

— NOW THAT IT IS OVER.—A lady who was shopping saw her husband examining pocketbooks at a showcase in another part of the store. When he had gone she approached the saleswoman in that department.

"Did he get the one I wanted?"

"Yes; the one with the silver horseshoe. I told him it was the best and would just suit."

"You're a jewel. I feared he would get something I didn't want. Thank you ever so much."

The husband had gone to his favorite drug store, where he asked:

"Has my wife been here?"

"Yes," said the clerk with a grin.

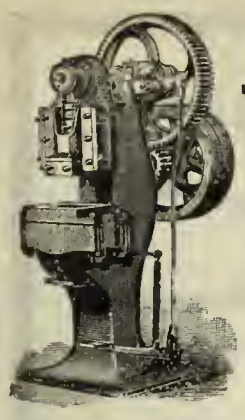
"Did she get a toothbrush or a box of cigars for my Christmas present?"

"She looked at cigars."

"Ha! I know the brand—$2 a hundred. Well, if she buys a box change them to my regular brand and I'll pay the difference. See?"

And the druggist saw.—*Detroit Free Press.*

NIAGARA



Power Punching Press.

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

A FULL LINE.

THE BEST AND MOST IMPROVED

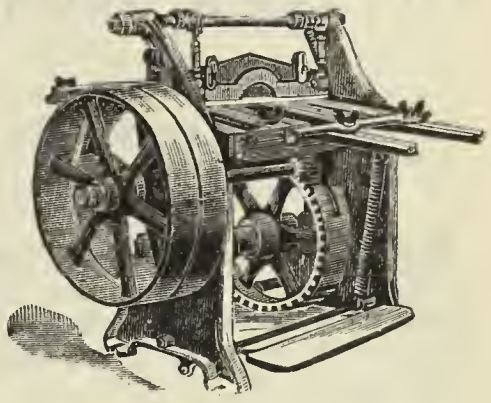
ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

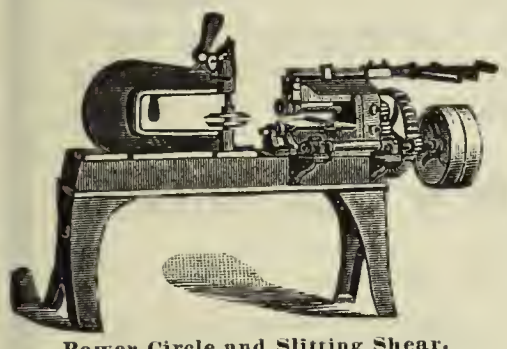
CORNICE MAKERS' TOOLS.

PRESSES AND DIES.

SQUARING, SLITTING and CIRCLE SHEARS.



Geared Power Squaring Shear.



Power Circle and Slitting Shear.

Complete Outfits for making Tinware, Cans and Other Sheet Metal Goods.

—MANUFACTURED BY—

THE NIAGARA STAMPING & TOOL CO.,

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**

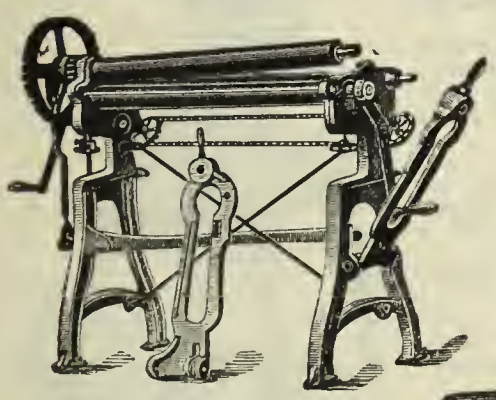
Metal Workers' Machinery.

For several years past our efforts have been directed solely towards the production of a line of sheet metal working machinery that would at once prove economical, durable and peculiarly adapted for the purpose intended. In this we have been successful beyond our most sanguine expectations and therefore desire to announce to all workers of sheet metal that it would be to their interest to correspond with us. We have a good stock of various machines on hand and in course of completion. Address

BERTSCH & COMPANY,

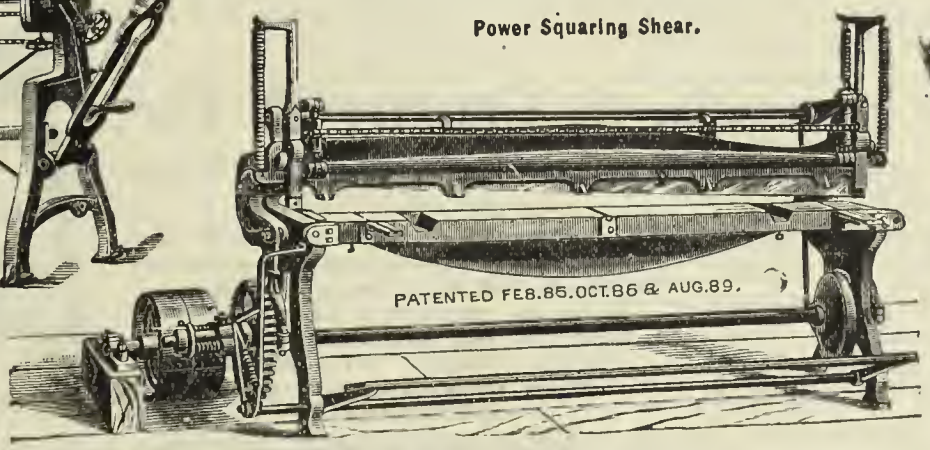
MANUFACTURERS OF SHEET METAL WORKING MACHINERY,

CAMBRIDGE CITY, IND.



Slip Roll Former.

Power Squaring Shear.



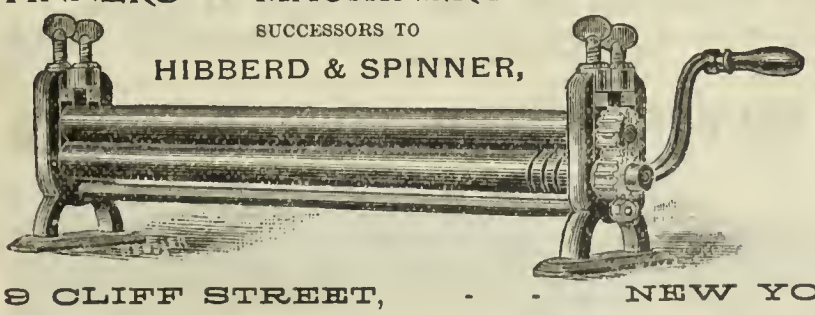
Punch and Stock Shear



TINNERS' - MACHINERY - and - SUPPLY - CO.,

SUCCESSORS TO

HIBBERD & SPINNER,



Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery, Presses, Dies and Can Makers' Tools.

FULL LINE OF SUPPLIES.

9 CLIFF STREET, - - NEW YORK CITY.

PATENT AUTOMATIC CAN BODY

SEAMERS.

COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.

218 New St.,

W. J. GORDON, PHILADELPHIA, PA.

— A Liberal Education.— A wealthy old farmer, as close as the bark on a tree, had sent his only son to a country academy to educate him.

"You shouldn't have sent him there," remonstrated a friend.

"What's the matter with the place?" asked the old man testily.

"It's too little and poor. You ought to send him to one of the big colleges and give him a liberal education."

"Liberal! Liberal!" squeaked the farmer excitedly. "Why, man, ain't it liberal enough when I allow him $25 a month for his schooling and living expenses?"—*Detroit Free Press.*

— Inexpensive.—"I promised to give my wife a surprise on Christmas."

"Indeed?"

"Yes. You see, it's all I can afford to give her."—*Chicago Record.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstrat on is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

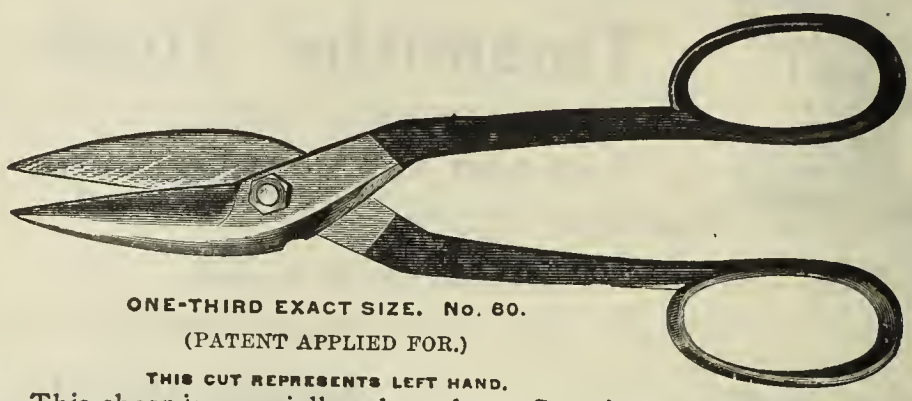
ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade Street, New York.

The "Lyon" Shear.



ONE-THIRD EXACT SIZE. No. 80.

(PATENT APPLIED FOR.)

THIS CUT REPRESENTS LEFT HAND.

This shear is especially adapted to **Cornice and Tin Work,** being so constructed that **Scrolls, Circles,** &c., can be **perfectly** and **accurately** cut, which **cannot** be done with the ordinary shear.

LYON, CONKLIN & CO., BALTIMORE.

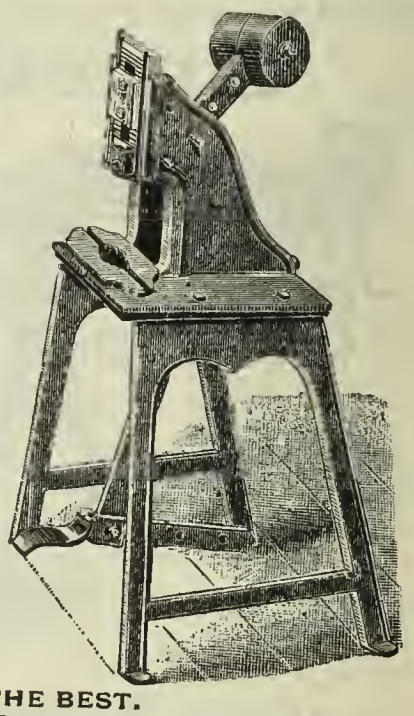
For Sale by

Fitz, Dana & Co. }
Brown & Wales, } Boston, Mass.
Austin & Doten, }
Meurer Bros. Co., Brooklyn, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.
The McIntosh-Huntington Co., Cleveland, O.
The F. H. Lawson Co., Cincinnati, O.
Sargent, Greenleaf & Brooks, Chicago, Ill.
W. S. Phelps & Son, Dayton, O.
O'Dell Hardware Co., Greensboro, N. C.
Stratton & Terstegge, Louisville, Ky.
Fones Bros. Hdw. Co., Little Rock, Ark.
Peden & Co., Houston, Texas.
Tanner & Sullivan, Indianapolis, Ind.
Manogue-Pidgeon Iron Co., Memphis, Tenn.
Phillips-Buttorff Mfg. Co., Nashville, Tenn.
C. S. Mersick & Co., New Haven, Conn.
Demmler Bros. }
McClure & Co., } Pittsburg, Pa.
G & A. Bargamin, Richmond, Va.
Excelsior Mfg. Co., }
A. Geisel Mfg. Co., } St. Louis, Mo.
Townley Stove Co., Terre Haute, Ind.
W. A. List & Co., Wheeling, W. Va.
Ed. Strauss, Waco, Texas.
C. A. Conklin Mfg. Co., Atlanta, Ga.

—OUR—

PENDULUM PRESSES

are suitable for a wide range of work. Grooved beds with sliding bolts for holding all sizes of dies. Perfectly fitted balanced, and adjustable to light and heavy blows. A first class machine in every respect.



MANUFACTURED BY

G. A. Crosby & Co,

176 & 178 So. Clinton St., CHICAGO, ILL., U. S. A.,

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap and Boiler Makers, and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Wire Goods, Brass Goods and all Hardware Novelties.**

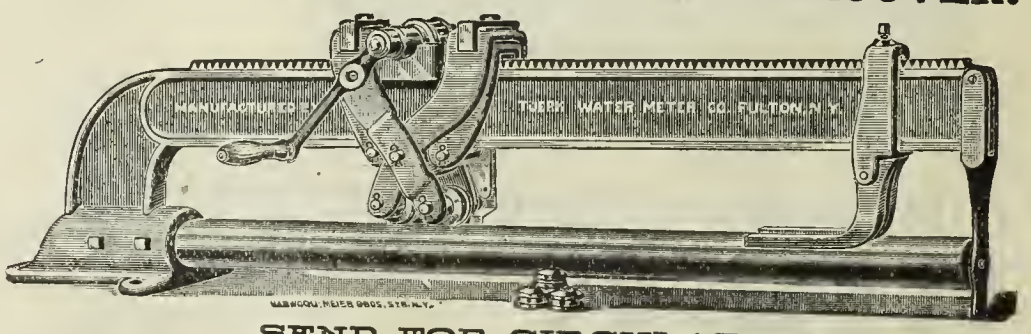
Special Attention to Dies of every Description.

WORK GUARANTEED THE BEST.

Write for Prices and Our New 200-Page Catalogue.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.

TUERK WATER METER CO.'S GROOVER.



SEND FOR CIRCULAR.

Manufactured by TUERK WATER METER CO., Fulton, N. Y.

ALPHABETICAL LIST OF ADVERTISERS.

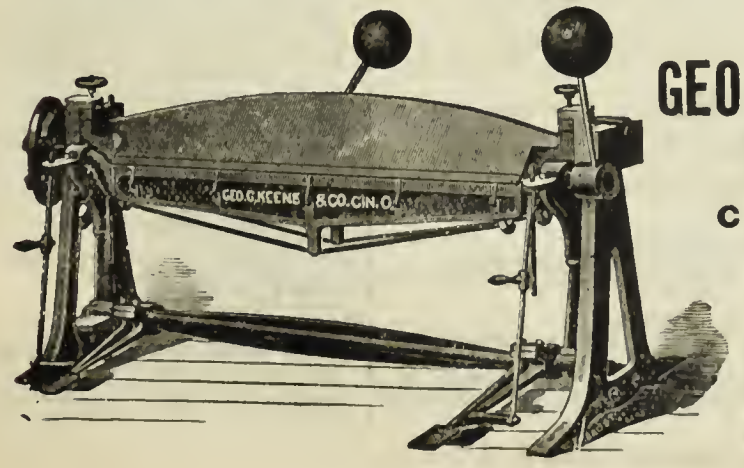
Acme Roofing Co..... 86
Ætna Standard Iron & Steel Co..... 81
Allen's Corrugating Wks... 82
American Boiler Co..... 19
American Radiator Co..... 1
American Roofing Co..... 86
American Sheet Iron Co..... 79
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 75
Auld & Conger..... 63
Bailey-Farrell Mfg. Co..... 74
Bangor Excelsior Slate Co.. 85
Barstow Stove Co..... 96
Bascom, H. Clay.. 71
Belden, F. E. Mica Mining Co..... 81
Belding Mfg. Co .....28&29
Bellaire Stamping Co..... 67
Berger Bros..... 75
Berger, L. D.....73&83
Berger Mfg. Co..... 78
Bertsch & Co..... 89
Bibb, B C. Stove Co 24
Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 62
Bowen Mfg. Co..... 31
Bower, B. P. & Co..... 77
Bowers, Galpin & Co..... 77
Brauer, A. G..... 71
Brombacher's Sons, Jacob.. 95
Bronson Supply Co..... 69
Bruce & Cook.....83&96
Buffalo Register Works..... 62
Burtis, A. L..... 88
Burton, W. J. & Co..... 84
Calely, Ed. L..... 71
Calvert, P. B. & Co..... 81
Cambridge Iron & Steel Co.. 80
Canfield, H. C..... 76
Canton Steel Roofing Co..... 88
Carton Furnace Co..... 3
Central Oilgas Stove Co..... 14
Central Stamping Co 65
Challenge Corn Planter Co.. 30
Chamberlain, J. W. Co..... 75
Cheney, S. & Son. 71
Chicago & Erie Stove Co..17&22
Cincinnati Corrugating Co 85
Clark, G. M. & Co..... 12
Clark Novelty Co..... 74
Clark, Quien & Morse..... 77
Clayton & Lambert Mfg. Co. 72
Cleveland Gas Machine Co.. 62
Clough, R. M 91
Columbia Refrigerator Co.. 39
Columbia Roofing Co..... 85
Colwell Lead Co..... 77
Cooney, Seiner & Co..... 74
Cope, Geo. W..... 71
Corning Mfg. Co. 24
Correspondence School of Mechanics..... 61
Cortright Metal Roofing Co. 87
Cory, U. & Co... 26
Covert Mfg. Co..... 64
Craig-Reynolds Fdy. Co..... 22
Crosby, G. A. & Co..... 90
Curtis & Curtis..... 74
Dalton-Ingersoll Co..... 72
Dangler Stove & Mfg. Co.... 8
Day Mfg. Co..... 73
Dayton Mfg. Co..... 15
De Haven & Co..... 16
Deming Co..... 74
Dixon, Jos., Crucible Co..... 85
Dixon-Woods Co..... 15
Douglas, W. & B..... 74
Dover Machine Works..... 91
Dunlap, John Co..... 81
Dwight Slate Machine Co.... 88
Eckstein, Chas. G. & Co..... 95
Electric Boiler Co..... 24
Eller, J. H. & Co..... 82
Emack, John D..... 85
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 85
Ferrosteel Co..... 15
Fostoria Steel Roofing Co... 87
Fox, Chas. F..... 27
Frink, I. P..... 96
Friedley & Voshardt..... 86
Froelich, A., Estate of..... 70
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Gait, John & Sons 85
Garry Iron & Steel Roofing Co..... 87
Geuder & Paeschke Mfg. Co. 66
Globe Iron Roofing & Corrugating Co..... 87
Globe Ventilator Co..... 71
Gobeille Pattern Co..... 71
Gordon, W. J..... 89
Gorton & Lidgerwood Co..... 1
Graff & Co..... 22
Greene, W. F..... 63
Griswold Mfg. Co..... 63
Gummey, Spering & Co..... 79
Gurney Heater Mfg. Co..... 19
Gurney Refrigerator Co..... 31
Halliday, M..... 87
Hammacher, Schlemmer & Co 65
Hart & Crouse..... 18
Hartford Hollow Ware Co.. 67
Hess, Snyder & Co..... 26
Highland Foundry Co. 1
Highton, Wm. & Sons..... 62
Holton Iron Roofing Co..... 86
Howard Furnace Co..... 32
Howard Thermostat Co..... 27
Howson & Howson 61
Illinois Refrigerator Co..... 30
Illinois Zinc Co 83
Iwan Bros..... 69
Jackson's Sons, W..... 17
Jenkins Bros..... 1
Jersey City Galvanizing Co. 75
Johnson, E. J. & Co 85
Kanneberg Roofing Co..... 76
Kansas City Metal Roofing & Corrugating Co..... 80
Keen & Hagerty..... 69
Keene, Geo. C. & Co 91
Kelly, Thos. & Bro..... 73
Kemp, C M Mfg. Co..... 73
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 61
Kewanee Boiler Co..... 26
Kieckhefer Bros. & Co..... 65
Kieley, T 1
Kilbourne & Jacobs Mfg. Co. 72
Lawrence-Letts Elbow Co... 77
Lawson, F. H. Co..... 68
Lindemann, A. J. & Hoverson Co..... 10
Littleford Bros..... 82
Lyon, Conklin & Co.... 90
McDaniel & Harvey Co..... 83
McLaughlin, J. K..... 71
Mahony, M..... 23
Marcy Stove Repair Co..... 70
Marlin & Co..... 77
Marston, I. G. & Co..... 73
Mason Regulator Co..... 1
Merchant & Co., Inc..... 84
Merry, Geo. E..... 79
Meurer Bros. Co..... 82
Mica Mfg. Co..... 31
Michigan Stove Co.....20&21
Michigan Vapor Stove Co... 11
Millar, Chas. & Son.... ... 96
Miller, Jas. A. & Bro....76,86&87
Miner & Peck Mfg. Co... ... 95
Monarch Stove Co..... 11
Montross Metal Shingle Co.. 84
Mt. Penn Stove Works..... 16
Mowry, W. C..... 24
Mullins, W. H..... 87
Munsell, E. & Co 31
Myers, F. E. & Bro..... 74
National Wringer Co..... 66
Newark Regulator Co..... 73
New Castle Steel & Tin Plate Co..... 79
New Haven Heating & Plumbing Co..... 19
New York Central Iron Wks. 25
New York Elbow Co..... 67
New York Iron Roofing & Corrugating Co..... 86
New York Metal Ceiling Co.. 85
New York Nickel Plating & Mfg. Co..... 70
Niagara Stamping & Tool Co. 89
Niles Mfg. Co..... 67
Obdyke, W. A. & Co..... 76
Obermayer, S. Co..... 70
Ohl, Geo. A. & Co 94
Osborn, J. M. & L. A..... 79
Ostrander, W. R. & Co..... 70
Page Boiler Co., Wm. H..... 23
Palermo Mica Co..... 27
Pancoast, Henry B. & Co.... 75
Paxson, J. W. & Co..... 70
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 74
Penn Iron Roofing & Corrugating Co..... 84
Phelps, Dodge & Co 80
Phillips Tin Plate Co..... 79
Pocock, C..... 88
Pontyminster Old Style Ternes..... 80
Poorman Mfg. Co..... 95
Portsmouth Stove & Range Co..... 25
Powers & Boyd Galvanized Iron Cornice & Roof'g Co. 87
Presbrey Stove Lining Co... 71
Proudman Bros..... 76
Puffer, W. E..... 63
Putnam Foundry & Machine Co..... 23
Rasner & Dinger..... 86
Rathbone, Sard & Co..... 9
Republic Iron Works, ... 81
Ringen Stove Co..... 2
Rising & Nelson..... 85
Robinson, J. M. & Co ... 95
Rochester Stamping Wks.... 67
Rome Mfg. Co..... 69
Root, A. L..... 85
Rutland Fire Clay Co.... 71
St. Louis Corrugating Co.... 82
St. Louis Stamping Co..... 69
S S. S. Conductor Co..... 77
Salem Nail Co..... 85
Sanborn, John. 85
Sandwich Novelty Co..... 64
Sannders' D. Sons..... 73
Savill, Walls & Co..... 75
Sayre Stamping Co..... 63
Schaffer, J. P..... 26
Schneider & Trenkamp Co.. 7
Scollay, J. A..... 26
Shepard, Sidney & Co..... 64
Sheppard, Isaac A. & Co..... 1
Sims Mfg. Co. 75
Smith & Winchester Co..... 23
Smith Co., H. B..... 25
Smith, J. D. Foundry Supply Co..... 71
Sonther, E. B. Iron Co..... 80
Special Notices..... 61
Sperry, D. R. & Co..... 67
Stamford Foundry Co..... 17
Standard Lighting Co..... 6
Star Conpler Co..... 18
Star Mfg. Co..... 6
Stebbins, E. Mfg. Co..... 76
Steel Clad Bath Co..... 73
Stellwagen & Kynoch..... 27
Stiles & Parker Press Co.... 94
Stocking, E. B..... 61
Sykes Iron & Steel Roofing Co 86
Taplin, Rice & Co..... 17
Tarbox Mfg. Co..... 70
Taylor Co., N. & G..... 96
Thatcher Furnace Co..... 18
Thorn Shingle & Ornament Co..... 88
Tinners' Machinery & Supply Co..... 89
Tinplate Decorating Co..... 80
Toledo Machine & Tool Co.. 88
Troy Nickel Works..... 31
Tuerk Water Meter Co..... 90
Tuttle & Bailey Mfg. Co..... 62
United States Heater Co.... 25
Utter, Sam S..... 27
Valentine, M. D. & Bro. Co... 71
Van Noorden, E. & Co.. 84
Van Range Co., John..... 4
Vedder Pattern Works..... 71
Vogel, William & Bros. 66
Walker & Pratt Mfg. Co..... 13
Washburne, E. G. & Co..... 71
Weathered's, Thos. W. Sons 19
Western Stove & Mfg. Co.. 10
Wheeling Corrugating Co... 87
Whitlock, W..... 76
Wisconsin Refrigerator Co.. 30
Wise, John & Son..... 63
Wister, L. & R. & Co 96
Wohler Aluminum Co..... 64
Wood, Alan Co..... 80
Wood Co., W. Dewees..... 96
Yates & Co..... 61
Zero Valve Co..... 73

THE KEENE FOOT POWER

CORNICE BRAKE.

EASIEST TO OPERATE, STRONGEST AND BEST.

Sheet Metal Working Machinery of all Kinds.



GEO. C. KEENE & CO.,

Cincinnati, O.

AGENTS:

Hibberd & Spinner,
9 Cliff St., New York

Holder & Herrick,
49 Broad St., Boston, Mass.

Ledwidge & Co.,
234 Lake St., Chicago, Ill.

PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

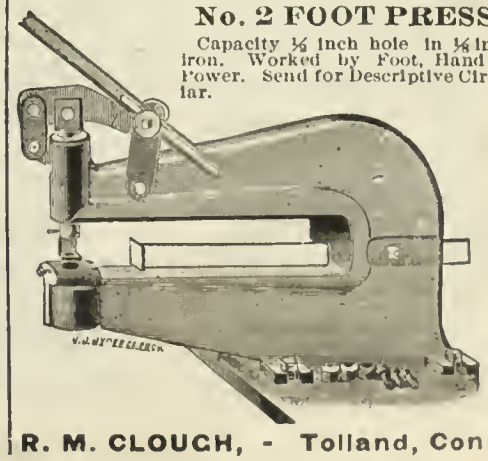
Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS., Dover, Del.

No. 2 FOOT PRESS.

Capacity ⅛ inch hole in ⅛ inch iron. Worked by Foot, Hand or Power. Send for Descriptive Circular.



R. M. CLOUCH, - Tolland, Conn.

CLASSIFIED LIST OF ADVERTISERS.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield H. O., Bridgeport, Conn,

Bathtubs.
Day Mfg. Co., Detroit, Mich.
Peck Bros., & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers Tools and Machines.
Bliss E. W. Co., Brooklyn, N. Y.
Crosby G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Chucks.
Whitlock, W., 39 Cortlandt St., N. Y.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Conductor Pipe and Elbows.
Acme Roofing Co., Canton, O.
Allen's Corrugating Works, Chicago, Ill.
Berger Bros., Philadelphia, Pa.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A., & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Corrugating Works, Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro. Chicago, Ill.
Powers & Boyd Galvanized Iron Cornice and Roofing Co., St. Louis, Mo.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cuspidores.
Rochester Stamping Works, Rochester, N. Y.

Cut-Offs, Rain-Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co. Indianapolis,
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
E. W. Bliss Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Mfg. Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill
Prondman Bros., Meriden, Conn.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Files.
Hammacher, Schiemmer Co., 209 Bowery, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Flour Bins and Sifters.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Foundry Facings, Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N, Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Craig-Reynold Foundry Co., Dayton Ohio.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J F, Furnace Co., Syracuse, N.Y.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Conn.
Thatcher Furnace Co., 240 Water St., N. Y.

Furnaces, Plumbers' and Tinners'.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Grocers.
Tuerk Water Meter Co., Fulton, N. Y.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y
Poorman Mfg. Co., Canton, Ohio.

Heater Regulators.
Buffer W. E., 8 Peck Slip, N. Y.

Heaters, Steam and Hot-Water.
American Boiler Co, Chicago, Ill.
Barstow Stove Co Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Fuller & Warren Co., Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New Haven Heating & Plumbing Co., New Haven, Conn,
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Putnam Foundry & Machine Co., Putnam Conn.
Scollay, Jno. A., Brooklyn, N. Y.
Smith Co., H. B. 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass
Thatcher Furnace Co., 240 Water St N. Y.
United States Heater Co., Detroit, Mich
Weathered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Wohler Aluminum Co., Chicago, Ill.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lawson, F. H. Co., Cincinnati, O.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co. Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis
Lawson, F. H. Co., Cincinnati, O.

Lamp Stoves and Heaters.
Central Oilgas Stove Co., Boston, Mass
Utter, Sam S., 113 Beekman St., N. Y.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 89 Fulton St., N. Y.

Molding Sand.
Obermayer, S. Co., Cincinnati, Ohio.
Smith, J. D., Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating and Mfg. Co., 227 and 229 West 29th St., N. Y.

Oil Cans.
Central Oilgas Stove Co., Boston, Mass
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Pattern Charts,
Burtis, A. L., Lockport, N. Y.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Caley, Edw. L., Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, Jno. K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa
Bower, B. P. & Co., Cleveland, O.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
Star Coupler Co., St. Louis, Mo.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher
Vogel, Wm. & Bros., 37 to 47 S. Brooklyn.

Pot Covers.
Shepard, Sidney & Co., Buffalo, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Peck, Stow & Wilcox Co., 27 Chambers St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 45 Vesey St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water
American Radiator Co., Chicago, Ill.
Exeter Mch. Works, Boston, Mass.
Gurney Heater Mfg. Co. Boston, Mass.
Smith, H. B. Co., 137 Centre St., N.

Reflectors.
Frink, I. P., 551 Pearl Street, N. Y.

Refrigerators.
Belding Mfg. Co., Belding, Mich.
Bower Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co., Grand Haven, Mich,
Columbia Refrigerator Co., Northville, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.
Illinois Refrigerator Co., Chicago, Ill.
Wisconsin Refrigerator Co., Eau Claire Wis.

Registers.
Buffalo Register Works Buffalo, N. Y.
Highton, Wm. & Sons, Boston, Mass
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St. N. Y
Wise, J. & Son, Butler, O.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel Corrugated and Plain.
Acme Roofing Co., Canton, O.
American Roofing Co., Cincinnati, O.
Berger Mfg. Co., Canton, O.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Columbia Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, Ohio.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing and Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
Souther, E. E. Iron Co., St, Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Conn.
Lyon, Conklin & Co., Baltimore, Md.
Pocock, O., Cincinnati, Ohio.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Emack, J. D., Philadelphia, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.
Rising & Nelson, West Pawlet, Vt.

SEE ALPHABETICAL INDEX, PAGE 91.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co. Toledo, O.
Tuerk Water Meter Co., Fulton, N. Y.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Thorn Shingle and Ornament Co. Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.

Skate Sharpeners.
Sandwich Novelty Co., Sandwich, Ill.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.
Rasner & Dinger, Pittsburgh, Pa.

Slater's Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bailey Farrell Mfg. Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Tieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son., Manlius, N. Y.

Stove Repairs.
Braner, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., City.
Troy Nickel Works Troy, N. Y.

Stove Trucks.
Fox, Chas. F., Dayton, Ohio.
Stellwagen & Kynoch, St. Ignace, Mich.

Stoves and Ranges.
Bibb, B. C., Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
DeHaven & Co., Pittsburgh, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co, Boston, Mass
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Stamford Foundry Co., Stamford, Conn.
Taplin, Rice & Co., Akron, O.
Thatcher Furnace Co., 240 Water St. N. Y.
Van, John, Range Co., Cincinnati O.
Walker & Pratt Mfg. Co., Boston, Mass.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Dixon-Woods Co., Pittsburgh, Pa.
Lindemann, A. J & Hoverson Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I
Central Oilgas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, O.
Dayton Mfg. Co., Dayton, Ohio.
Lindemaun, A. J. & Hoverson Co., Milwaukee, Wis.
Mich. Vapor Stove Co., Grand Rapids, Mich.
Monarch Stove Co., Mansfield, Ohio.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Utter, Sam S., 113 Beekman St., N. Y.
Western Stove and Mfg. Co., Milwaukee, Wis.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Bruce & Cook, 186 to 190 Water St. N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Dunlap, John Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Lawson, F. H. Co., Cincinnati, Ohio.
Lyon, Conklin & Co., Baltimore, Md.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila., Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., N. Y.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Keen & Hagerty, Baltimore, Md.
Kleckhefer Bros. & Co., Milwaukee Wis.
Lawson, F. H. Co., Cincinnati, Ohio.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N. Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, Ohi, George A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., Cliff St., N. Y.

Traps and Vents.
Bower, B. P. & Co., Cleveland, O.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, O. M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 2.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - -	$1.00	SIX MONTHS, - - - - - -	$22.10
ONE MONTH, (5 Times.) - - - - -	5.00	ONE YEAR, - - - - - -	40.30
THREE MONTHS. - - - - - -	12.35		

RATES FOR LARGER SPACES QUOTED ON APPLICATION.

DAVID WILLIAMS, Publisher,

96, 98, 100 and 102 Reade Street, NEW YORK. **59 Dearborn Street, CHICAGO.**

New York (Main Office), - - - -	96-102 Reade Street. - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - - -	220 South Fourth Street, - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - - -	Room 509, Hamilton Building, - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - - -	59 Dearborn Street, cor. Randolph, - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - - -	Rooms 22-24 Pickering Building, - - -	HENRY SMITH, Manager.
St. Louis, - - - - - - - -	Bank of Commerce Building, - -	H. H. ROBERTS, Manager.
Boston, - - - - - - - -	146 Franklin Street, - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - - -	312 The Cuyahoga, - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon St., London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A., The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

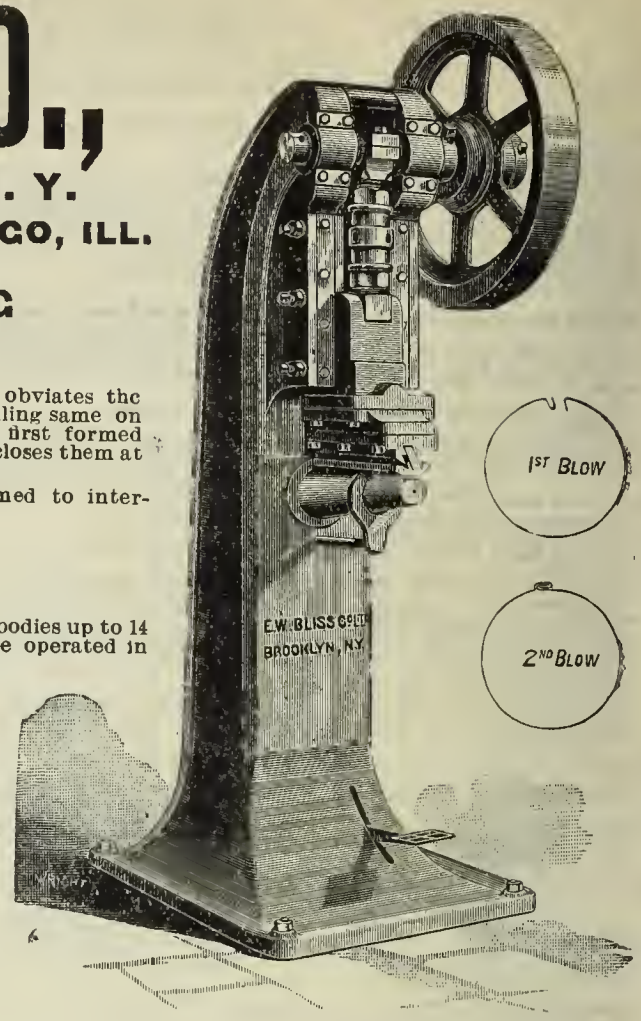
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.



PRESSES, PUNCHES, SHEARS,

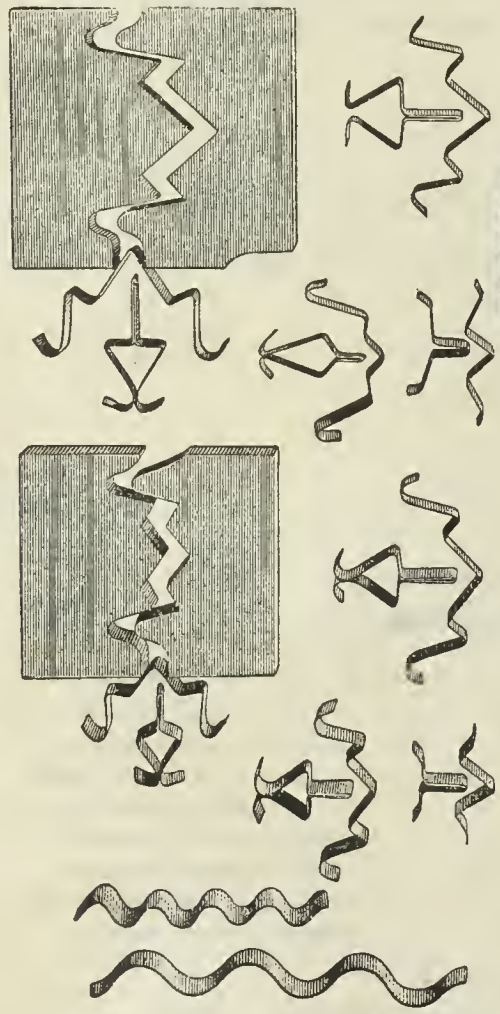
DROP HAMMERS,

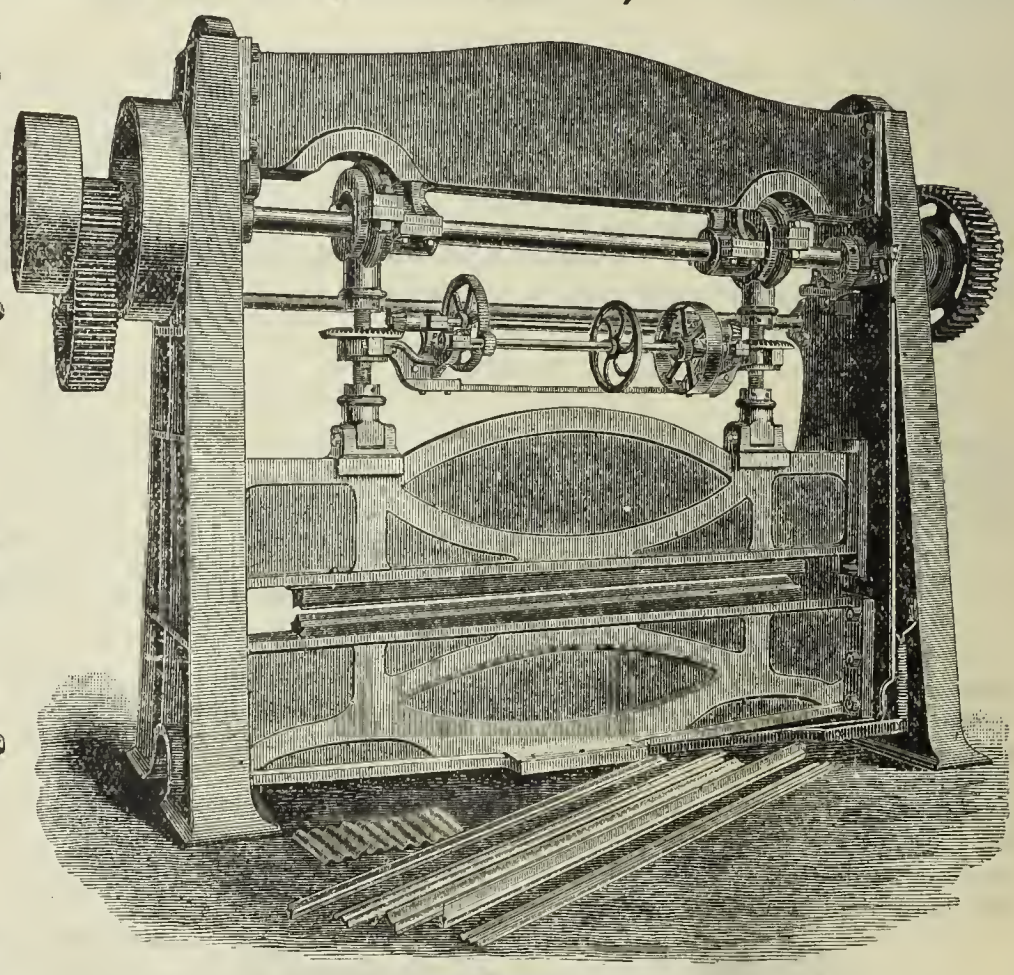
DIES, SPECIAL MACHINERY, &c.

THE STILES & PARKER PRESS CO.

GEO. A. OHL & CO., 157, 159, 161 Oraton Street, NEWARK, N. J.

SOME SAMPLES OF WORK PRODUCED ON THESE MACHINES.



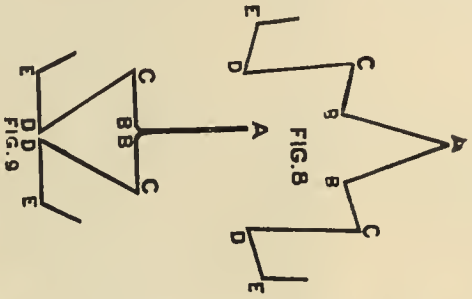


Improved Sheet Metal Power Press.

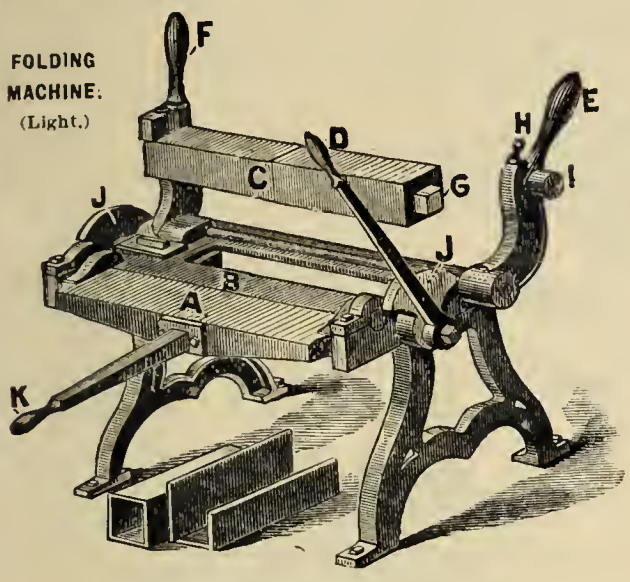
The above cut represents a ten foot power press weighing 20,000 pounds. This machine will make a skylight bar seven (7) bends at once of No. 24 iron, corrugate as heavy as No. 14 iron, also will press out mouldings of any shape that can be pressed between two dies. It is provided with a special mechanism for raising and lowering the hammer, with the die holder and die, to suit the different heights of the latter.

SHEET IRON, BRASS, ZINC, COPPER

working machinery of the newest and best designs is what we are and have been building for all kinds of shops, and for 37 years have been making and selling the "Globe" Cornice Brake. The first machine ever built for the purpose and which still stands at the head. If you will send us your address we will be glad to send you illustrations and description of what we make. If in the city, call and see us.



FOLDING MACHINE. (Light.)

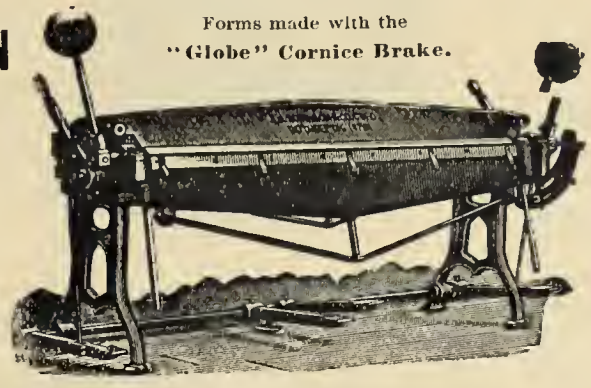


J. M. ROBINSON & CO.,

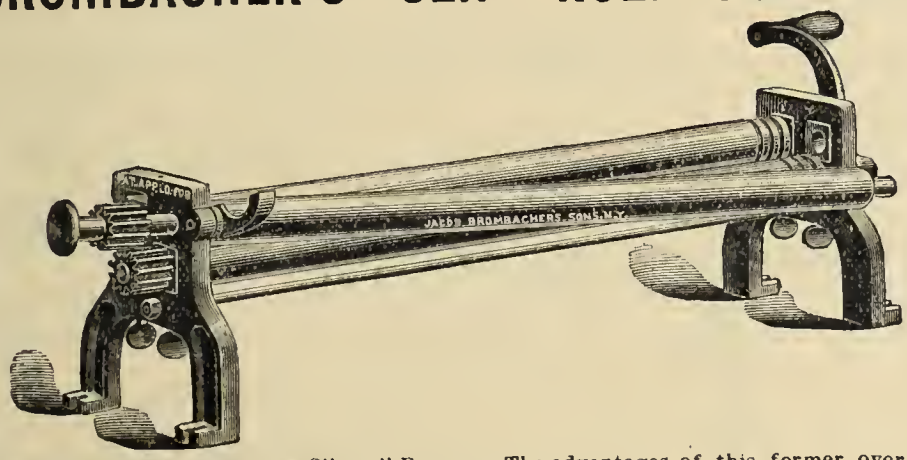
CINCINNATI, OHIO.

This Advertisement Is Changed Weekly.

Forms made with the "Globe" Cornice Brake.



BROMBACHER'S SLIP ROLL FORMER.



Above cut represents our new Slip-roll Former. The advantages of this former over ordinary formers are

First, that the rollers are made of cold rolled steel rolls.

Second, it has cut gears with consequent smoothness of operation.

Third, the thumb screws are inserted from underneath, consequently the box carrying the rollers rests on the screws instead of the screws carrying the boxes and rollers; this obviates the possibility of breaking thumb screws.

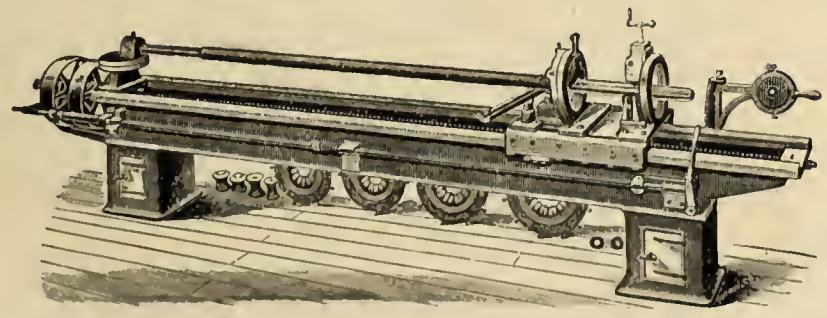
Fourth, we do not have to split one frame in order to obtain the slip roll mechanism, and we therefore have all the rigidity of ordinary formers with all the convenience of slip-roll formers.

Above design makes the smoothest and quickest operating and stiffest Former on the market and they are sold at the price of ordinary Stove Pipe Formers.

JACOB BROMBACHER'S SONS - - No. 30 Cliff St., N. Y. City.

Established 1833 Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

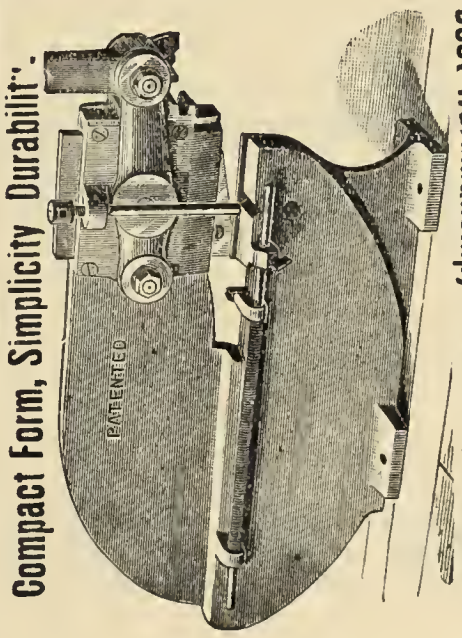
WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

CHAS. G. ECKSTEIN & CO.,

45 Vesey St., New York.

Punches and Shears, Wrought Iron Ornaments, Mouldings, Rosettes, Fence Pickets, etc.



Best Workmanship, Few Parts, Low Price.

Compact Form, Simplicity Durability.

SEND FOR CIRCULAR.



— A VERBAL SLIP. — Cholly Chumpleigh: "I have a dog that knows as much as I do."

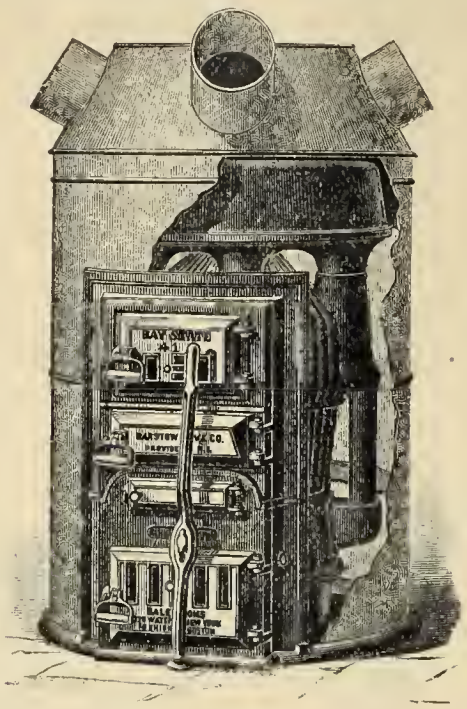
Miss Coldeal (absently): "I think dogs are awfully stupid animals."—*Truth.*

—MISS TRILL: "I love to hear the birds sing."

Jack Downright (warmly): "So do I. They never attempt a piece beyond their ability."—*Tit Bits.*

This is the "BAY STATE" Furnace.

All cast iron, with the latest improvements.
A large deep ash pit, yet specially adapted for low cellars.



"BAY STATE."

MEANS

VERY HEAVY—SCIENTIFIC—HIGHEST GRADE.

THE

STANDARD OF MERIT,

And our prices are right.

THEN CERTAINLY

Our "Bay State" Furnaces, Ranges and Stoves are the very best.

Why not order a sample or send for special circulars and secure the agency for your territory?

BARSTOW STOVE COMPANY,

Incorporated,

BOSTON. PROVIDENCE, R. I. NEW YORK.

Have you our Catalogue and Price-List?

A FULL STOCK

IS ALWAYS CARRIED AT OUR

NEW YORK OFFICE,

231 WATER STREET.

N. & G. TAYLOR CO.,

Manufacturers of Tinplate,

PHILADELPHIA.



L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK

TINNERS' TOOLS and MACHINES.

TINNERS' SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOO

By far the best Spout made. Greatly proved this season. More used every year th all others combined Sold by leading jobb everywhere, and to them by

CHARLES MILLAR & SON, Utica, N.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON

PATENTED:

December 10th, 1878.
January 10th, 1882.
January 1st, 1884.
February 12th, 1884.
March 4th, 1884.
April 15th, 1884.
June 10th, 1884.
January 6th, 1885.
August 31st, 1886.
January 1st, 1889.
January 17th, 1893.

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. Al WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh, Pa.

The Metal Worker Essays on House Heating by Steam, Hot Water and Hot Air.

WITH INTRODUCTION AND TABULAR COMPARISONS.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

How to Effectively and Economically Heat a Given Building

is a problem of the highest importance to the Architect, Builder and Owner. Shall steam, water or air be employed as a medium? What are the relative merits of the different systems? By what means can a comparison be instituted that will show their respective advantages?

The essays comprised in this volume are some of the results of a prize contest conducted by *The Metal Worker* some time since. They include the prize essays and selections from the best of the others. The foundation of all the essays is a house, the floor plans and elevations of which were the result of previous competitions conducted by *Carpentry and Building*. The elevations and the plans of this house were carefully printed on separate sheets adapted to receive at the contestants' hands lines indicating the position of heater, runs of pipes, location of radiators, etc., thus insuring a uniformity in presentation, and also holding the competitors to exactly the same conditions. The result, therefore, is a book in which are shown: First, different means of heating the same house, among which may be instituted various comparisons, and, second, several different interpretations of each of the several methods, among which also instructive comparisons may be instituted.

The work is not a mere theoretical consideration of principles and a statement of facts gained by inquiry in the trade; but, instead, a collection of essays by practical men, each showing how one man would go about heating the building in question, using the means with which he is best acquainted in practice. Features of the book which are not the least important among its numerous merits are the *lists of items and statement of cost* accompanying the different essays. Never before in the history of the heating trades has there been offered such a collection of information directly from the practice of those who are actively engaged in the heating business as is contained in this volume.

"The whole forms a valuable and instructive exposition of current practice in house heating."—*American Machinist.*

"Covers the ground very completely."—*Scientific American.*

"It will be found as complete a compendium as possible of existing information on this subject, amply illustrated by drawings."—*The Sanitary Era.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume. Price, $3.00.

SENT, POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS, Publisher, 96-102 Reade St., New York.

Index to Reading Matter, Page 58.

Index to Advertisements. Pages 91 - 93.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

VOL. XLIII. NUMBER 4.

NEW YORK AND CHICAGO, JANUARY 26, 1895.

ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



NATIONAL.

AMERICAN RADIATORS (TRADE-MARK.) BEST ON EARTH.

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

111 and 113 Lake Street, CHICAGO, ILL.

New York. 93 Centre St. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler

GORTON & LIDGERWOOD CO., 96 Liberty St., New York

197-203 Congress St., Boston. Old Colony Bldg, Van Buren and Dearborn Sts., Chicago.

F&WCO

GUARANTEED STOVES FURNACES RANGES & HOT-WATER HEATERS

FULLER & WARREN CO. TROY, N.Y.

PARAGON HOT AIR FURNACES

SIX POINTS ~ 1·FEWEST JOINTS 2·EQUALIZED DRAFT 3·LARGEST RADIATING SURFACE 4·ABSOLUTELY SELF CLEANING 5·BALL BEARING GRATE 6·PERFECT ADAPTABILITY TO ANY KIND OF COAL

ISAAC A. SHEPPARD & CO. —MANUFACTURERS PHILADELPHIA, PA. & BALTIMORE, MD.

Write for our FURNACE BOOK "HINTS ABOUT HEATING"
It will interest you IT MAY HELP YOU
EXCLUSIVE RIGHTS GIVEN TO ENTERPRISING DEALERS

The Best Galvanized Iron

ought not to require specification, for a first-rate job of difficult work can't be done without it, and a first rate job costs less with it than an honest attempt at a first-rate job without it.

Every first-rate metal-worker probably knows that Apollo is true to gauge and flat and bendable.

It is of some little account that the top and bottom sheets of a bundle are cushioned against the bands; and so are delivered almost without blemish, just as the top and bottom sheets protect the inside sheets from the bands in other makes.

Apollo Best Bloom is the trade-mark. It costs a little more in large quantities. This is the only reason that other galvanized iron is sold at all.

APOLLO IRON AND STEEL COMPANY,

Pittsburgh Pennsylvania

WORKS AT APOLLO

Write for new Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES

HIGHLAND FOUNDRY CO., BOSTON, - MASS.

SECOND EDITION.

"Kitchen Boiler Connections."

A Selection of Practical Letters and Articles

—RELATING TO—

Water Backs and Range Boilers.

Compiled from *The Metal Worker*.

71 Illustrations.

A Practical Helper. Price, $1.00.

DAVID WILLIAMS, PUBLISHER, 96-102 Reade St., New York.

The COLD WAVE FLAG

Has no terror for those using a

FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.

EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO., Boston, Mass.



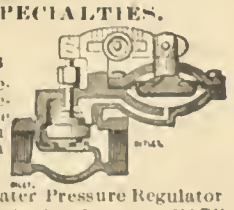
We claim the following Merits for Jenkins Bros'. Valves:

1. They are Mechanically Made.
2. They have Improvements that no other valves have.
3. The Metal is in the right place.
4. Nothing but the best Steam Metal is used.
5. All parts are Interchangeable.
6. Every Valve Tested before leaving the manufactory.

New York, Chicago. JENKINS BROS. Philadelphia, Boston.

STEAM SPECIALTIES.

Pump Governors, Steam Traps



Steam and Water Reducing Valves, Noiseless Back Pressure Valves, Damper Regulators and Oil Separators.

Send for Circulars.

Water Pressure Regulator

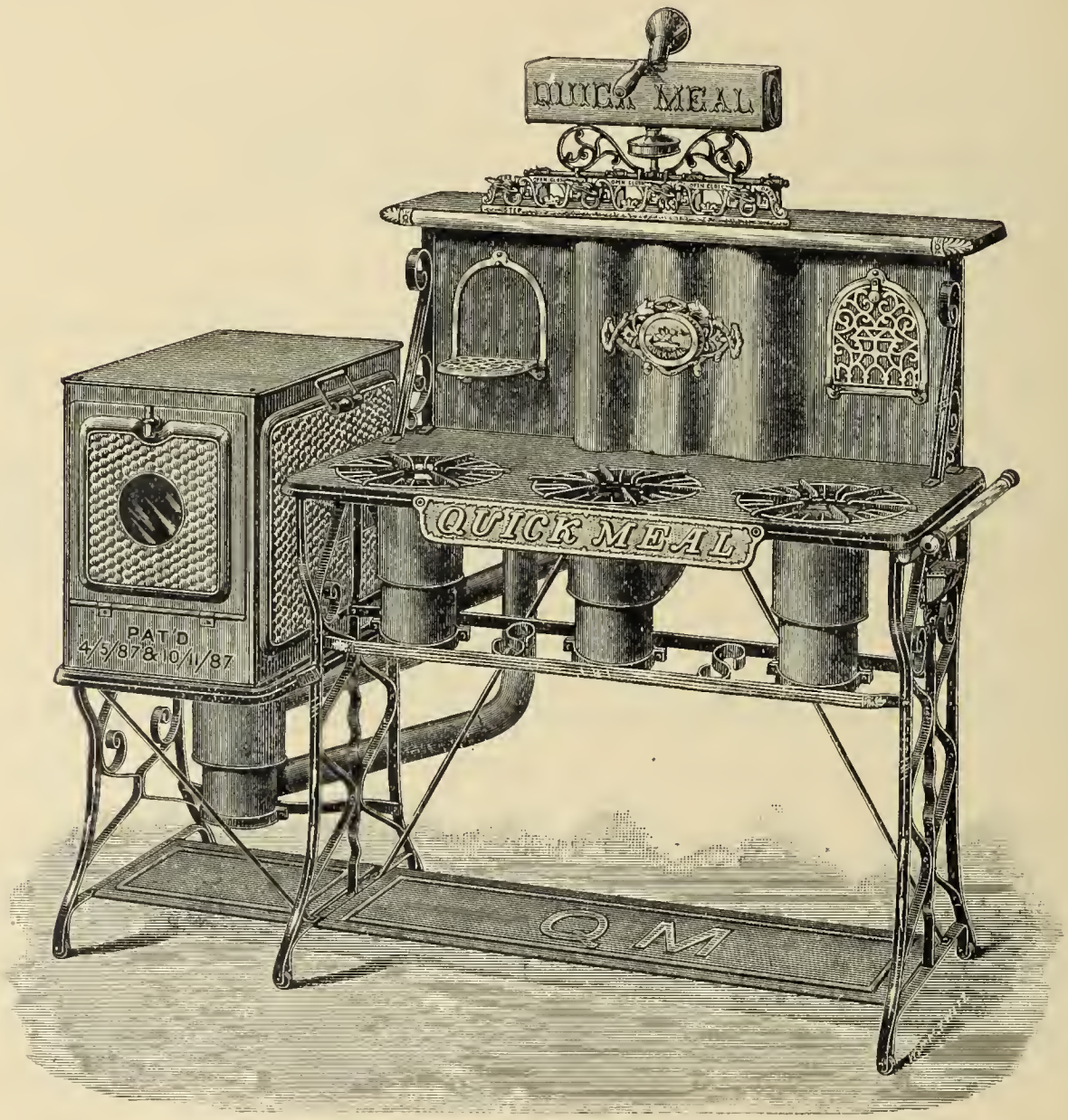
T. KIELEY, 7 to 11 W. 13th St., NEW YORK.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

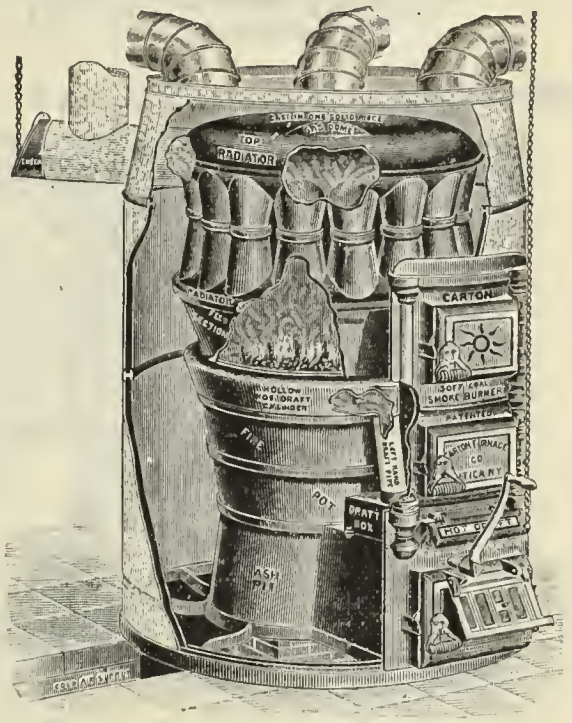
ST. LOUIS.

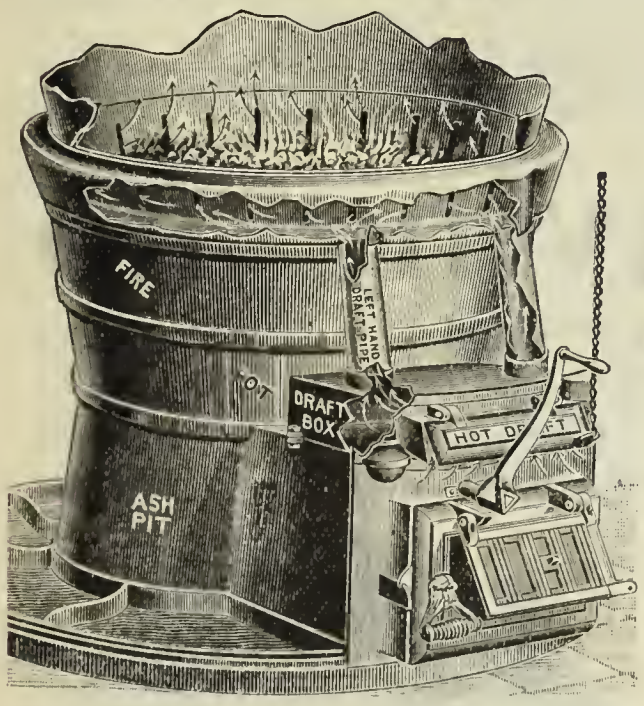
Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

Hot Water & Steam Boilers & Furnaces.

OUR SOFT COAL SMOKE CONSUMER.





Smokeless!!

Sootless!!

Vertical Combustion Flues. Draft EQUALLY divided.

NO CENTRE Draft, but ALL SIDE Draft.

No accumulations in Radiators. No Clean-out Doors.

NO Bolts Used. Most Durable Furnace.

OUR CATALOGUE AND PRICES WILL INTEREST YOU.

MANUFACTURED BY

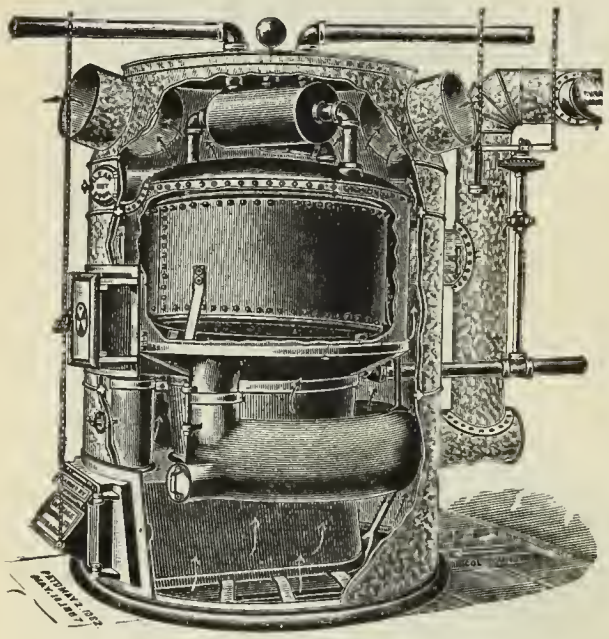
Carton Furnace Co.,

UTICA, N. Y.,

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

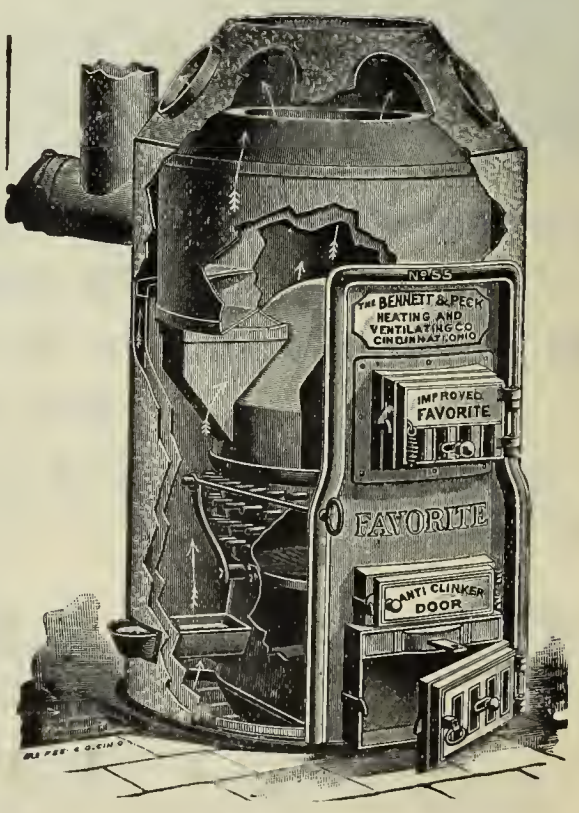
J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

A Man having no

knowledge of the furnace business is likely as not to be gulled by such effervescent statements as "The Best," "The Only," "Guaranteed" and a host of others of like character, but what we want to impress upon the public is the fact that "The Favorite" **is** good, **is** efficient, **is** economical and **is** cheap! What more can you ask? If you'll write we'll make you a special proposition. Will you do it? If so do it now, not later, it may be too late.



The Peck-Williamson Heating & Vent'g Co.

Formerly The Bennett & Peck Heating & Vent'g Co.),

Cincinnati, O.

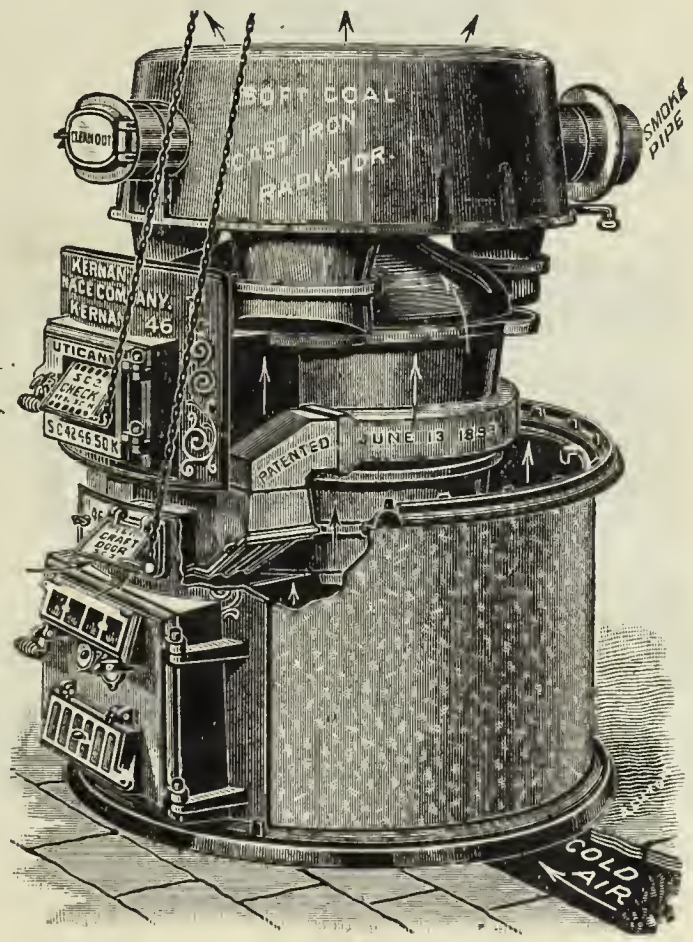
CHICAGO OFFICE,
82 W. Washington Street.

KERNAN

Smoke Consumers

Lead

In all the sections of the country where soft coal is used.



Proofs Furnished

For

All We Claim.

Don't Hesitate.

An Inquiry

Will Cost You

One Cent.

Now is the time to secure the agency and thereby control the furnace trade of your locality. Do not waste time and money experimenting on new and untried constructions. The

Kernan Smoke Consumers

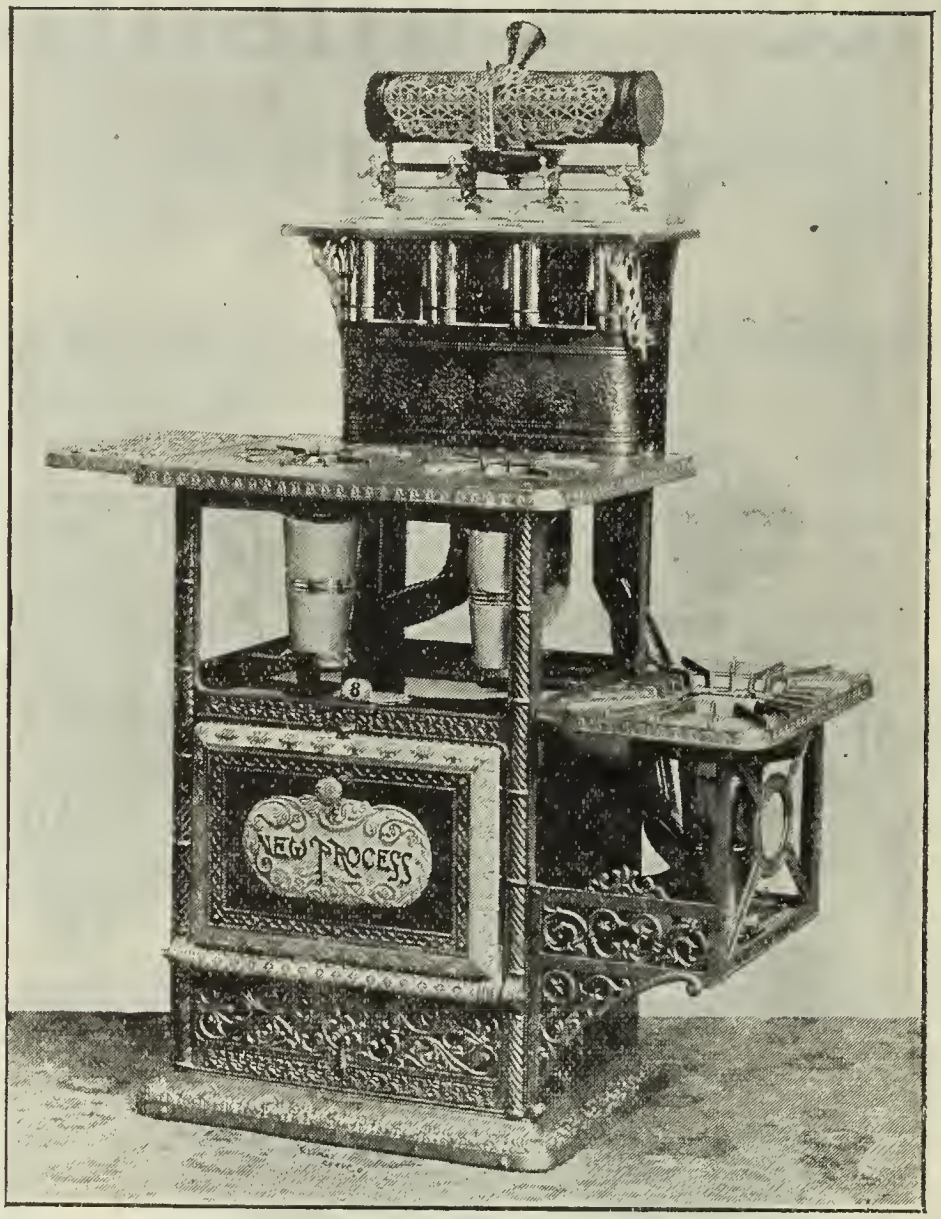
have been used for several years in all parts of the country and with every variety of soft coal and are now conceded by the trade and public to be the only warm air furnace in which soft coal can be cleanly and economically used.

Send for Reference Catalogue of Soft Coal Furnaces.

Kernan Furnace Company,

71 W. Washington St., CHICAGO, ILL. UTICA, N. Y.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

——MADE ONLY BY——

THE STANDARD LIGHTING CO.,
CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La.
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
Milton Rogers & Sons, Omaha, Neb.

Important Notice!

All dealers in and users of vapor stoves are hereby warned that **THE STANDARD LIGHTING COMPANY,** of Cleveland, Ohio, and its duly authorized licensees have the exclusive right to make, use and sell vapor stoves employing the evaporating principle as embraced in the several patents granted Charles M. Hollingsworth, Rudolph Flick and Zebulon Davis relating to Process and Apparatus for Vaporizing Liquid Hydrocarbons and to Improvements in Vapor Stoves, and that all who purchase, use, sell or offer for sale stoves embracing said inventions, or any of them, made by others than The Standard Lighting Company, or its authorized licensees, are liable to prosecution, as well as the manufacturers of such stoves.

Having been lately informed that a Vapor Stove was being manufactured and offered for sale in Milwaukee, Wisconsin, which infringed the Hollingsworth patents No 420,797, No. 421,834 and No. 470,756, and the Flick patent No. 483,051, The Standard Lighting Company has commenced suit against the manufacturers for infringement of these patents and is now prosecuting that suit in the Circuit Court of the United States for the Eastern District of Wisconsin. It has also brought suit for infringement of these patents in other districts against dealers who are advertising such stoves or offering them for sale, and hereby notifies all who may either sell or offer for sale infringing stoves that they, as well as the manufacturers, will be held responsible therefor. For the purpose of protecting its licensees, as well as itself against all infringements, it will bring suit against others who sell, offer for sale or use such inventions, or vapor stoves containing them, without authority from it, so far as may be necessary to fully assert its exclusive rights in respect thereto; and it requests all who may know of any sale or offer for sale of infringing stoves to promptly notify it of the name and residence of the person or company selling them, or offering them for sale, in order that it may proceed to enjoin such infringers and to recover such damages as may accrue thereby.

The following are the only authorized manufacturers of these inventions, to wit.:

THE STANDARD LIGHTING COMPANY, CLEVELAND, OHIO,
THE DANGLER STOVE & MFG COMPANY, CLEVELAND, OHIO,
THE SCHNEIDER & TRENKAMP COMPANY, CLEVELAND, OHIO,
THE AURORA VAPOR STOVE COMPANY, CLEVELAND, OHIO,
THE QUICK MEAL STOVE COMPANY, ST. LOUIS, MO.,
JOHNSON & BRANDON, ST LOUIS, MO.,
GEO. M. CLARK & CO. CHICAGO, ILL.,
THE MONARCH STOVE COMPANY, MANSFIELD, OHIO.

The Standard Lighting Company,

CLEVELAND, OHIO.

Throughout the year of Ninety-five
The MONARCH STOVE COMPANY will be alive;
And Dealers who 'gainst hard times strive
With MONARCH STOVES will see trade revive.





Our Spring Poet may be off color, but he sings truthfully. The new Catalog is now ready, and it's a Hummer.

Yours for the asking.

A postal card will tell us you want one, and will be tickled to death to send it.

The Monarch Stove Co.,

MANSFIELD, OHIO.

AGENTS.

E. H. HUENEFELD, - - Cincinnati, O., Ky., Tenn., So. Ohio. So. Ind.

COOK RANGE & STOVE CO., Chicago, Ill., Wis., No. Ill.

DANVILLE STOVE CO., Danville, Pa., and 284-286 Pearl St., N. Y., Penna. New York. New Jersey, New England.

THE ZAHNER & BATTELL MFG. CO., Kansas City, Missouri, Kansas.

THE HALL BROS. CO., Lincoln, Neb.

TROPIC

VAPOR STOVES

TWELFTH SEASON

OVER 100,000 MANUFACTURED

NINETEEN DIFFERENT SIZES AND STYLES,

INCLUDING A FULL LINE OF

Evaporating Sheet Steel Vapor Stoves.

Evaporating Cast Frame Cabinet Ranges.

Hot Generating Full Size Stoves.

Hot Generating High Junior Stoves.

Hot Generating Low Junior Stoves.

DON'T BUY A VAPOR STOVE Until you have seen our New Patterns for 1895.

SAMPLES NOW READY AND CATALOGUES FURNISHED ON APPLICATION.

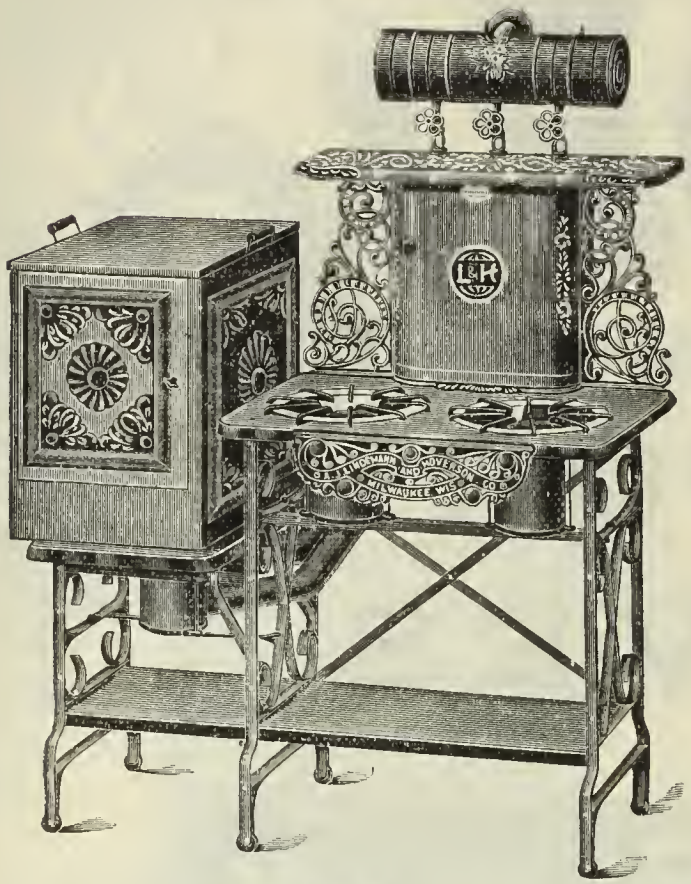
RATHBONE, SARD & CO.,

ALBANY, N.Y. CHICAGO, ILL. AURORA, ILL. DETROIT, MICH.

L. & H. STOVES

FOR

GASOLINE, GAS and OIL. (Kerosene.)



The most Complete Line, Latest Designs, Best Workmanship, Finest Appearance.

Our assortment includes Juniors, Individual Burners, Single Generators, Evaporating Process, Gas Ranges, Hot Plates, Lamp Stoves and Oil Cooking Stoves.

Write for Catalogue and Secure Agencies.

A. J. LINDEMANN & HOVERSON CO., Milwaukee, Wis.

"GOVERNOR" GASOLINE STOVES "PRINCESS"

We are pleased with the prospects of the coming Gasoline season.

Since the Dealers have seen our Stoves and convinced themselves that we manufacture and carry

The Most Complete Line, the Finest Appearing and Best Working Gasoline Stoves,

Inquiries and orders are pouring in on us. This is very gratifying and at the same time nothing unusual, as the intelligent buyer will at all times avail himself of an opportunity to get the best at the same price.

And we certainly insist that our Gasoline Stove is the best in the Market.

Our Illustrated Catalogue is ready and will be sent on application.

Send for Discount and Secure Territory.



Western Stove & Mfg. Co.

MILWAUKEE, WIS.

CHICAGO OFFICE: Room 73, 88 & 90 Washington Street, T. J. DUFFY, Jr., Sales Agent.

DEALERS!

All Weak Points About Vapor Stoves

are not called to your attention by unscrupulous manufacturers or their salesmen. They often palm off imperfect and faulty stoves as perfect, and jolly you into the belief that you have struck a bargain.

But when summer comes and truth comes to light, as it invariably does in the vapor stove business, vexation and disappointment come with it. Vexation, because you have been duped, disappointment, on account of the loss of a season's profit.

Better handle a *good line* at a fair profit than a *poor* line at a *bargain* profit. There is no such thing as a "bargain," especially in the vapor stove business. *Proof*—Review the past???

Better buy from a responsible manufacturer or his legitimate jobber, especially of one whose integrity is unquestioned, and one whose knowledge of the vapor stove business secures you an honest deal and prevents the imposition of fakes or shoddy goods. *There are a few of us left.*

Better buy a good line to be successful. A *bad* stove is a very poor purchase at *any* price.

Better look for Protection.

Protection in order to be of service to you must begin at home. See that this point is not overlooked when casting about for a line for 1895

Better think this over.

The old adage reads, "Make Haste *Slowly*." This is a weighty proverb. The more so when you consider that the best versed manufacturers in the vapor stove industry are not offering any new inventions or innovations for the coming season.

Yours respectfully,

THE SCHNEIDER & TRENKAMP CO.,

479-501 Case Ave., Cleveland, O. 67-69 Lake St., Chicago, Ill.

Jobbers Who Will Handle the Reliable for 1895.

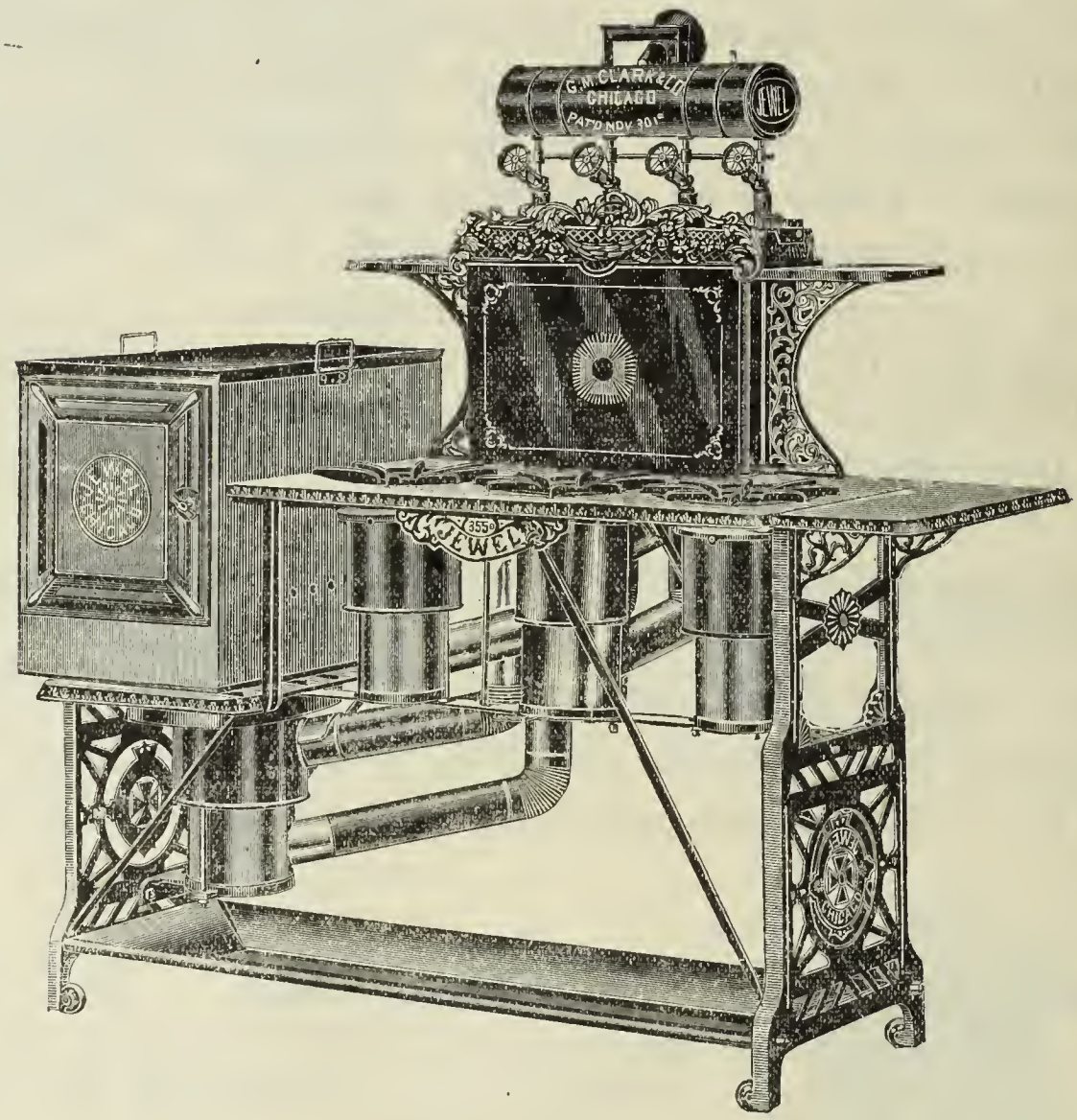
THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas and Oklahoma Territory.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F. FOX, Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N. CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

CATALOG READY SOON.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

AURORA
Process Stoves

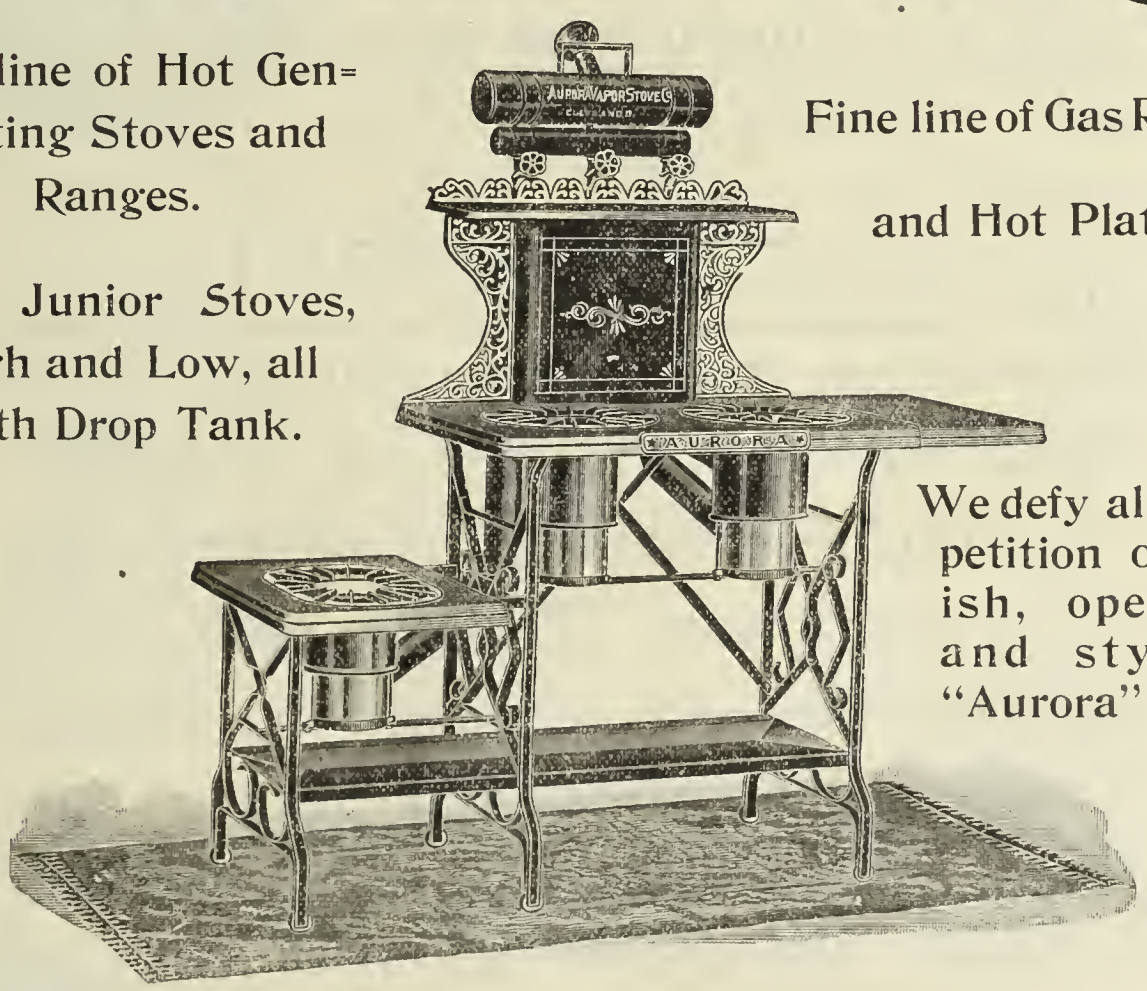
SALES IN 1894 DOUBLED.

Brass Cylinders.
German Silver Points (Rust Proof).
Removable Drip Valves.
Sight Feeds
Ornamental High Shelf Brackets.
Extra Extension Shelf on all Stoves.

"Aurora" is King.

Full line of Hot Generating Stoves and Ranges.

Also Junior Stoves, High and Low, all with Drop Tank.



Fine line of Gas Ranges and Hot Plates.

We defy all Competition on finish, operation and style of "Aurora" stoves

Send for 1895 Catalogue, now ready.

Aurora Vapor Stove Co.,
CLEVELAND, OHIO.

—AGENTS—

THE PERRY STOVE CO., Albany, N. Y. H. W. PEAK, Fort Worth, Tex. JACOB RETTERER, Chicago, Ill.
JAS. BEAKEY STOVE CO., St. Louis, Mo. JANNEY, SEMPLE & CO., Minneapolis, Minn.

IMPORTANT ANNOUNCEMENT.

To Our Patrons and the Trade Generally:

Our new Catalogue for 1895 will be ready for distribution within a few weeks. We take this means of announcing in advance of its publication that we have very carefully studied the requirements of the trade in every particular, and that our lines will be complete. We will place on the market specialties in entirely new goods that will commend themselves both by reason of popular prices and their many attractive and desirable features. In addition to our very popular Oilgas Cook Stoves, containing our improved 1895 Burners that are giving such perfect satisfaction, we have something entirely new in the line of special Lamp Stoves at special prices; also Sheet Steel Circular Burner Oil Cook Stoves. Write for further information and prices.

CENTRAL OILGAS STOVE COMPANY,

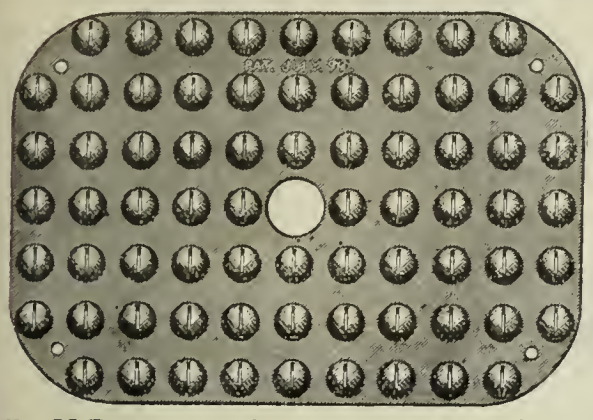
—Manufacturers of—

Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes.

BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.

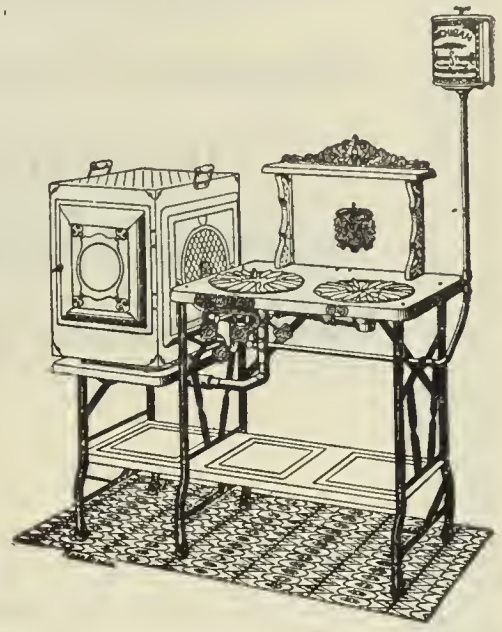
Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*



No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

OUR JET CONE BURNERS distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

and

SPECIAL JUNIORS.



Simplest, Safest, Best.

Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET, - - - - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

Announcement of

An Important Meeting to take place at Offices of

The Ferrosteel Company,

Wade Building, Cleveland, Ohio,

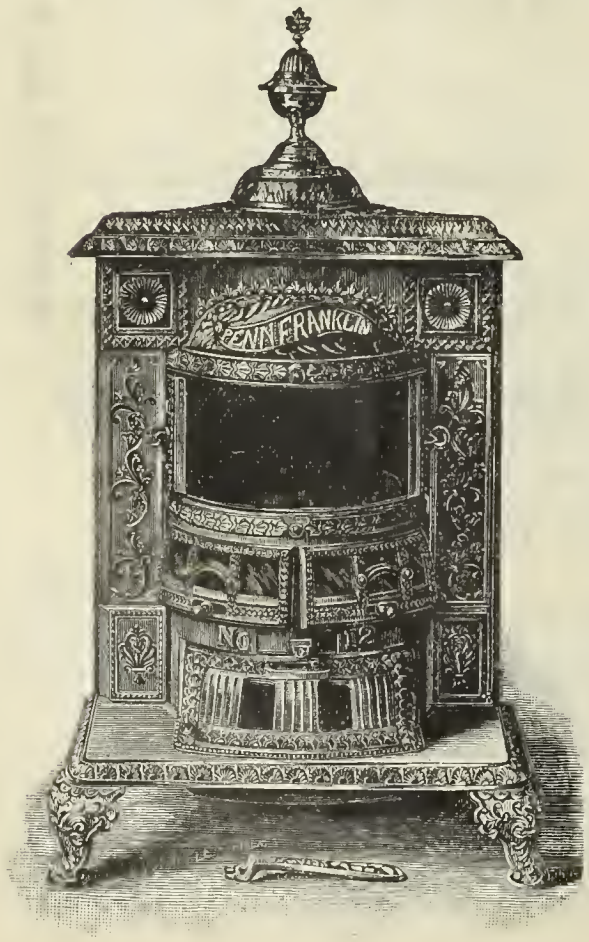
Monday, February 4th, 1895—And following days.

This meeting is one of orders and inquiries for Ferrosteel Ranges that will be received. Also applications for agencies. Orders from traveling representatives, too. Will your order, inquiry or agency application be received with others? It's the style now to handle Ranges made of Ferrosteel. New sizes for 1895 Spring trade.

The

Penn Franklin

MT. PENN STOVES & RANGES READING PA.



Open Parlor Stove.

(Easily Converted into a Natural Gas Stove.)

Just close the mica doors and it can be operated like any round or square parlor stove. Close it up tight and there is no dust when raking. Burns any kind of fuel, and is a strong heater.

Easy to Sell,

Profitable to Handle.

☞ DROP US A POSTAL FOR PRICES.

Mt. Penn Stove Works,

READING, PA.

MT. PENN STOVES & RANGES READING PA.



IT has been said that in America TWO CLASSES of Stoves and Ranges are sold, viz.:

"GARLANDS"

—AND—

OTHERS.

At the very head and front of the "Others" stands our new line of

"MICHIGAN"

Stoves and Ranges, which are unquestionably the latest, handsomest and most artistically designed Stoves and Ranges to be found upon the market at anything like the price at which they are sold.

They are made under our own supervision; by same workmen and out of the same material from which "Garlands" are made, and this fact of itself should be sufficient to cause them to be preferred by discriminating merchants and consumers, as against all other brands, excepting the invincible line of "Garlands."

WILL H. BRADLEY DES

GARLAND STOVES AND RANGES
The World's Best

The Michigan Stove Company,

Largest Makers of Stoves and Ranges in the World. . . . .

DETROIT, BUFFALO,
CHICAGO, NEW YORK CITY.

ROUND CLIMAX.



For Soft Coal and Wood.
Three Sizes: Nos. 14, 16, 18.
Single or Double Sectional Fire Pot.

Taplin, Rice & Co.,

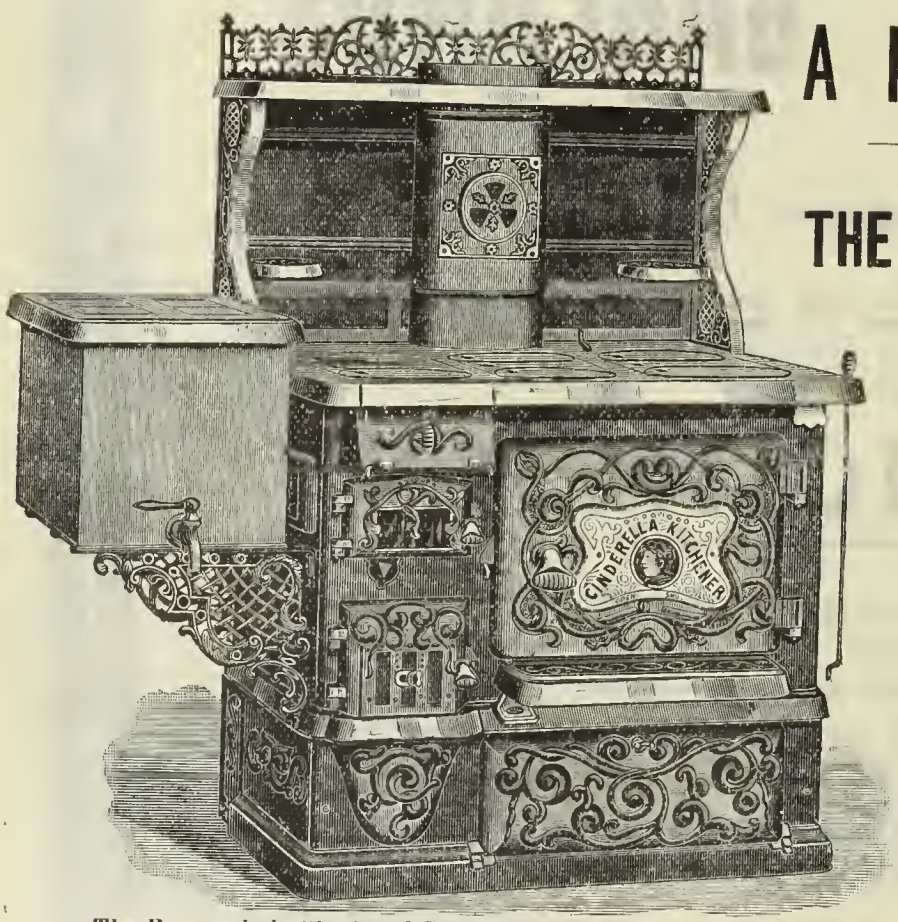
AKRON, OHIO,

MANUFACTURE established leaders in the line of **COOK and HEATING STOVES** and hereby respectfully solicit inquiries and orders for their specialties.

SOLAR CLIMAX.



For Hard Coal.
Three Sizes: Nos. 114, 115, 116.



The Reservoir is Planished Copper, and holds fifteen gallons.

A FEW WORDS
TO THE PROGRESSIVE DEALER.

THE CINDERELLA KITCHENERS

Are an entirely new series of

ALL CAST IRON RANGES,

Adapted for burning

HARD OR SOFT COAL OR WOOD.

They have embodied in their construction many new and desirable features that are thoroughly practical and will meet the approval of the "up to date" dealers. The Cinderella Kitcheners are also made with feet and skirting in lieu of the Low Closet. A full complement of High Shelves and High Closets accompany the same. Every appointment is the latest, and for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No 716,	Oven 16 x 16, 10½	inches high.
718,	18 x 18, 11½	"
818,	18 x 18, 11½	"
719,	18 x 20, 12½	"
819,	18 x 20, 12½	"
821,	20 x 22, 13½	"
921,	20 x 22, 13½	"

IF YOU ARE INTERESTED WRITE FOR PRICES.

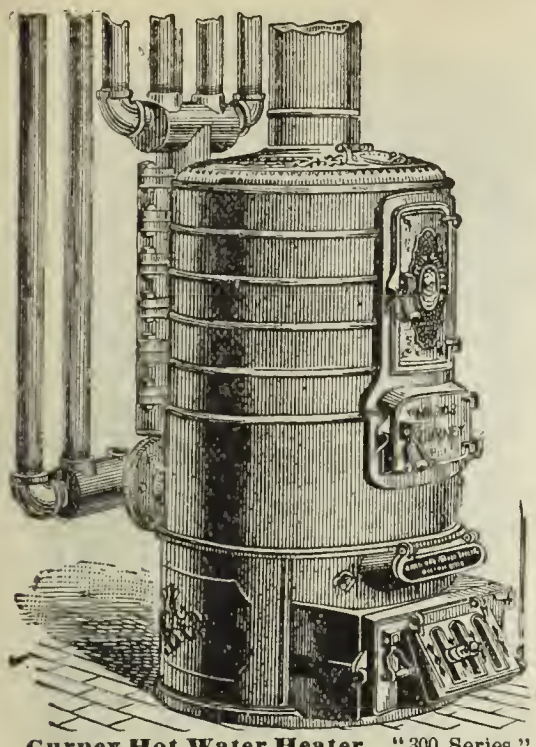
We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

We Would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited - - Pittsburgh, Pa.

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie. Pa.



Gurney Hot Water Heater. "300 Series."

RESULTS ARE CONVINCING EVIDENCE.

THE GREAT SUCCESS WHICH

Gurney

HOT WATER HEATERS, STEAM BOILERS, RADIATORS,

Have attained is due to the **FACT** that they embody

BEST

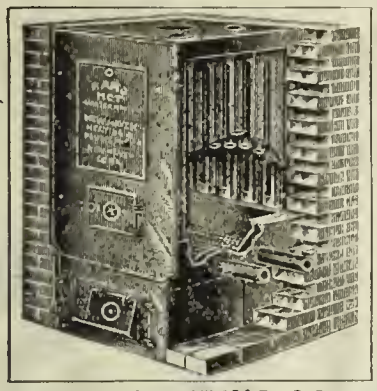
WORKMANSHIP, CONSTRUCTION, MATERIALS, ADAPTABILITY, IDEAS.

ALWAYS EQUAL TO THE OCCASION.

Send for Catalogues. Sold only to the Trade. **GURNEY HEATER MFG. CO.,** 163 Franklin St. Cor. Congress, Boston, Mass.

Selling Agents, A. A. Griffing Iron Co., 34 Dearborn St., Chicago, Western States.

NEW HAVEN HEATING AND PLUMBING CO.



NEW HAVEN, CONN.

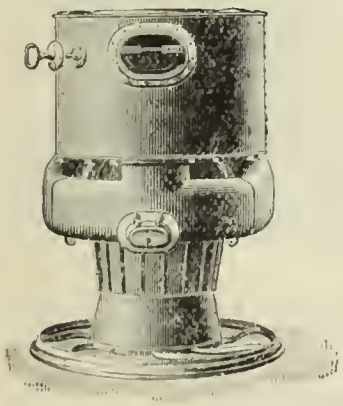
Rapid Hot Water Heater,

Selling rapidly to the Trade only.

MONEY IN IT FOR YOU.

Send for Catalogue, Price-List and Discount.

OXFORD PERFECT BLAST FURNACES.



CONSTRUCTED WITH A

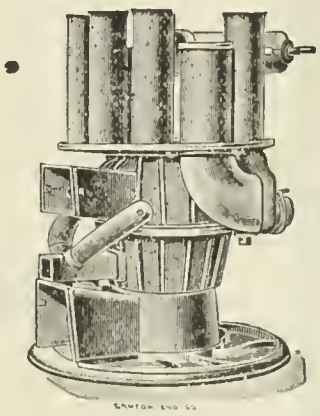
POSITIVE WORKING AIR BLAST

AND

UTILIZING INDIRECT CURRENTS

TO INCREASE HEATING CAPACITY.

SEND FOR NEW CATALOGUE.



THE J. H. McLAIN COMPANY, Canton, Ohio.

NEW YORK, 69 Centre Street. CHICAGO, 88 Lake Street. DENVER, 1525 Champa Street, SAN FRANCISCO, 5 Crocker Bld'g.



DO YOU KNOW

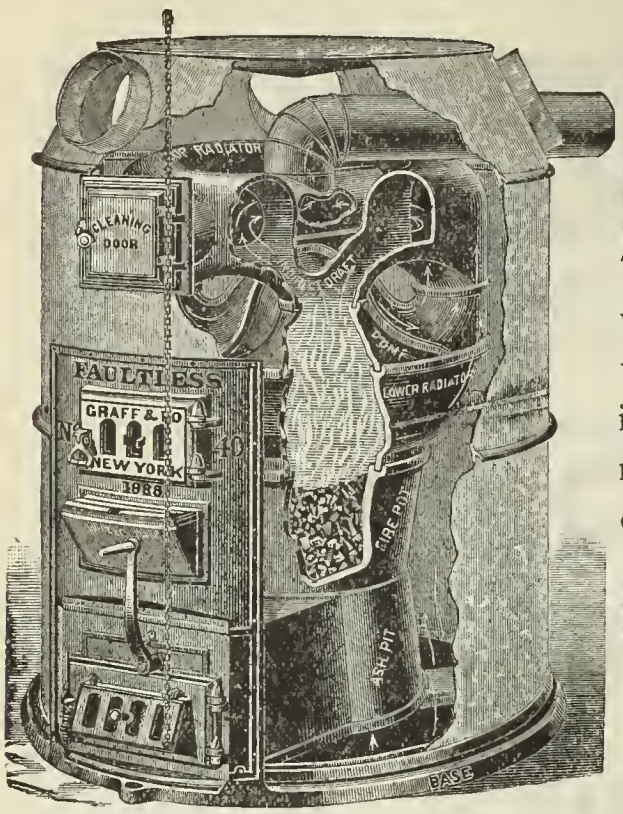
That we are the Largest Manufacturers of Steam and Hot Water Heating Apparatus in the World?

WRITE FOR CATALOGUE AND PRICES.

American Boiler Company

94 Centre St., New York. **84 Lake St., Chicago.**

FAULTLESS.

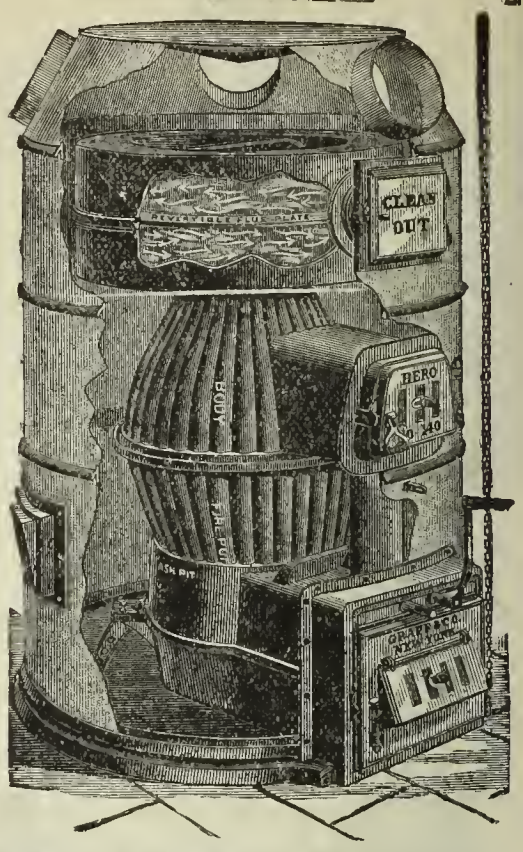


YOU WANT THE BEST FURNACE

That you can buy, and we have got it. You will not be disappointed in any selection you may make from our assortment of

FURNACES OR RANGES.

HERO.



SMITH & BRIGHT,
175-177 Lake St., Chicago, Ill.

GRAFF & COMPANY, Manufacturers,
208 Water Street, New York.

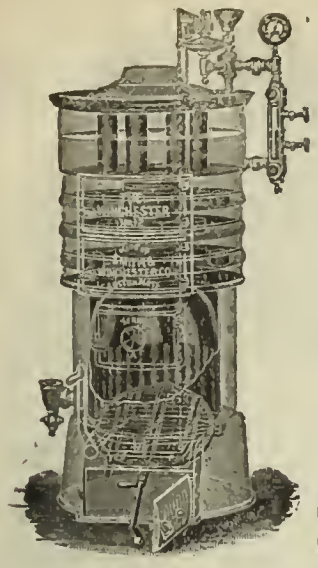
FURNACES

The TRIUMPH Series.
"There are none better."

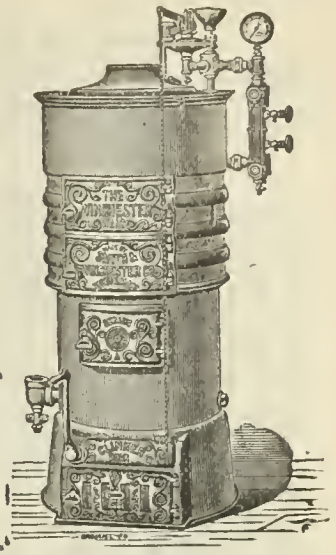
Mfd. by
The Craig-Reynolds Fdy. Co.,
DAYTON, O.

GEO. D. HOFFMAN,
Mgr. Western Branch,
82 LAKE STREET, CHICAGO.

Patent *STEEL* Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



The Winchester



Has more **COMMENDABLE**

And less **OBJECTIONABLE FEATURES**

Than any Heater on the Market.

——MADE BY——

SMITH & WINCHESTER CO., Boston. Mass.

Our prices on these Heaters will please you. Send for them.

ROYAL HEATERS.

SOLD ON THEIR MERITS. NOT ON THEIR ANTIQUITY.

HOT WATER. STEAM. HOT AIR. COMBINATION.

LARGEST ASSORTMENT OF STYLES AND SIZES.

CATALOGUES GIVE FULL DESCRIPTION.

CORRESPONDENCE SOLICITED.

MANUFACTURED BY

HART & CROUSE.

UTICA, N.Y.

NEW YORK. 211 WATER ST.

CHICAGO. 79. LAKE ST.

KEEP IN MIND



The Plummer

Steam Heater

AND

The Leader

Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,

PUTNAM, CONN.

THE VOLUNTEER

STEAM



For hot water or steam has no superior, and is the only hot water boiler that is SELF REGULATING.

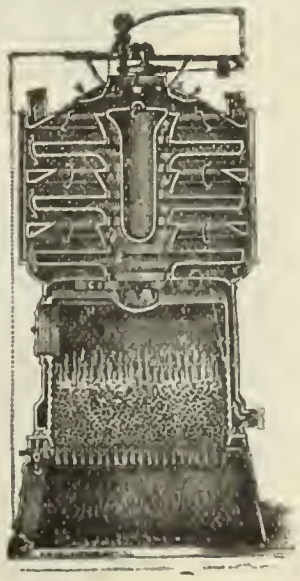
Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Street.

SECTIONAL VIEW, Hot Water.



Electrical Cooking.

Electrical cooking is making considerable headway, and at present engages the fancy of fashionable London to a small extent, it being a "smart" thing to have an electrical dinner. But difficulties sometimes have to be overcome. The Institution of Electrical Engineers had their annual dinner the other day, says the Pittsburgh *Dispatch*, and felt that under the circumstances it must be electrically cooked. As luck would have it, the old-fashioned hotel they resorted to had not even the electric light, but a pair of wires were run temporarily. Then the chef was heard from. Opposition had been expected in that quarter, but he was simply furious and obdurate. He said he had two grandmothers dependent on him, and he would not run the risk of being killed to please anybody. At last the dinner committee induced him to go to one of the places where electric cookery was regularly used, and from angry skepticism he was soon converted and brought into a condition of superb enthusiasm. The dinner was cooked electrically, was an immense success, and if the old hotel does not soon add the electric light and electric cooking to its other admitted virtues it will not be the fault of the chef.

—THE FARMER'S MISTAKE.—"Jerusha," cried Farmer Haymow, "come here an' look at this young man on a bicycle. If he hain't got his hair as long as a woman's."

"Sho!" exclaimed Jerusha, when she had adjusted her spectacles. "That there's a gal in bloomers."

A PRETTY HINT.

She said to the youth as they stood at the door
While parting—the artful thing:
"Don't knock, if you please, as you d d before,
But next time come with a ring."

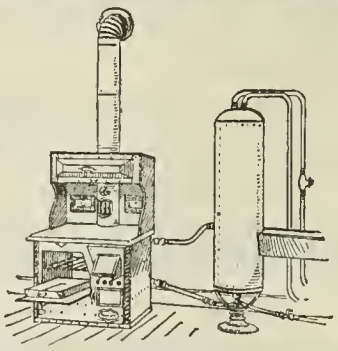
—*Exchange.*

★ STAR WATER BACK AND BOILER ★

COUPLERS.

DONT WIPE YOUR JOINTS — SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

NO SOLDER NO BURST — ANY MECHANIC CAN DO IT

WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.
Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada.

Song in the Household.

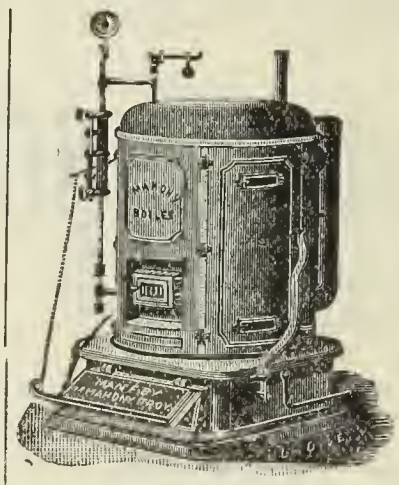
If any one has his choice about where he shall grow up let him stipulate for a family in which there are singers. It is a sore pity to grow up where there is no singing. In early days an American child's chances were better than now of being born into a reasonably large family; and though in some families all the members have music in them and in others none, of course the more there are the better the chances of song. Song is almost pure gain. It need not be of very high quality so long as it emanates naturally from inside of the singer and does him good. Its value as an appurtenance to domestic life lies not in its merit as a performance, but in its success as an expression of the feelings. Singing as a fine art is, of course, worth cultivating, but the species of song that we are now talking about is of the same sort as the singing of birds and of negroes. Ordinary, normal children ought to learn it by ear as they do language, and they should sing because they are happy, as the birds do. A child that grows up where there is no singing no more gets his rights than a young robin that is hatched out in an incubator. The robin is pretty sure to sing when he grows up and is turned loose in the sunshine, whether his ear got any early cultivation or not, for the habit has been strong in the robin family for generations. But if the child does not get his singing instincts developed by example while he is a child they may stay asleep permanently.—*Exchange.*

— No Misnomer.—Ignoramus: "How did England's great comic journal come to be called *Punch?*"

Wiseacre: "From the modus operandi of getting a joke into an Englishman's head."—*Exchange.*

– Most Marvelous: "Prof. Von Gookenheimer, they say, is a most marvelous mind reader and hypnotist."

"Yes; he claims he can attract the attention of a restaurant waiter by merely looking at him steadily for half an hour."—*Life.*



THE MAHONY BOILERS.

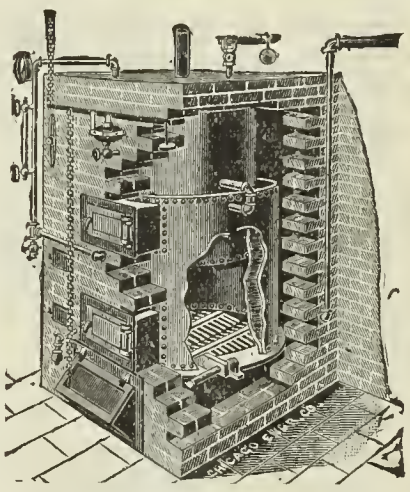
For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use HARD or SOFT COAL.

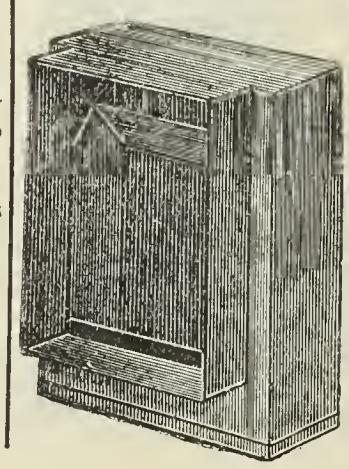
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



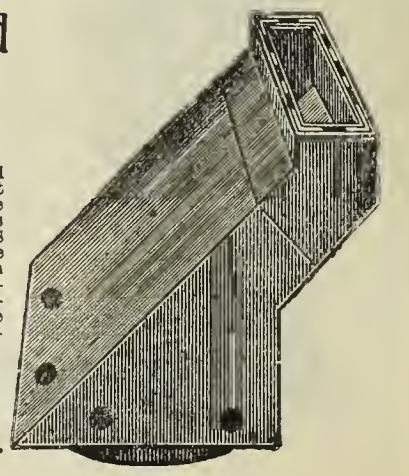
Novelty Ventilated Wall Pipe,

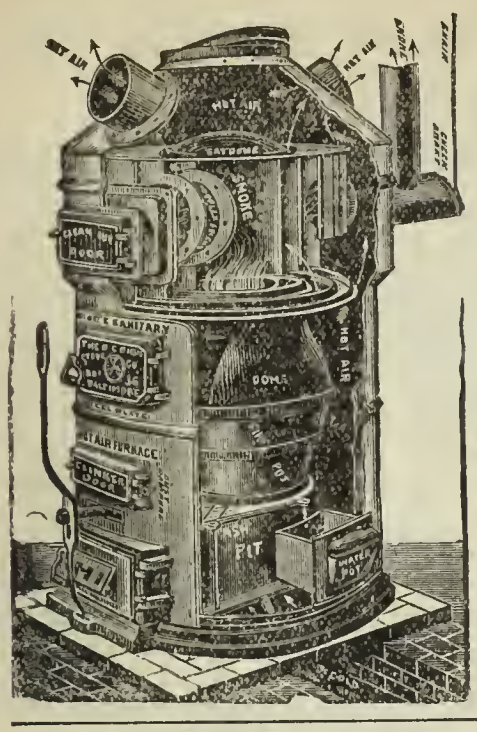
Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER,
18 Wood Street, Pittsburgh, Pa.





THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

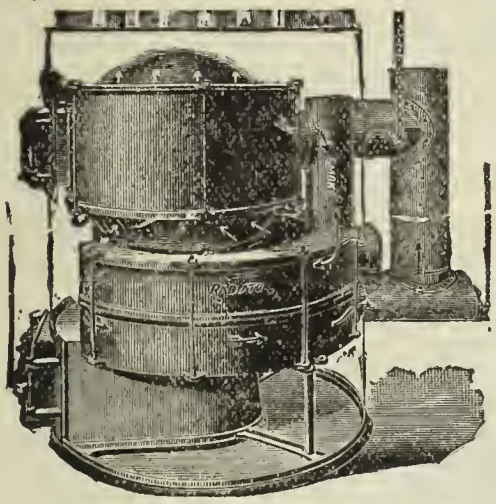
Baltimore Fire Place Heaters.

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

It Is a Base Burner.
It Is a Great Economizer of Fuel.
It Does Not Heat the Cellar.
It Is a Low Furnace.

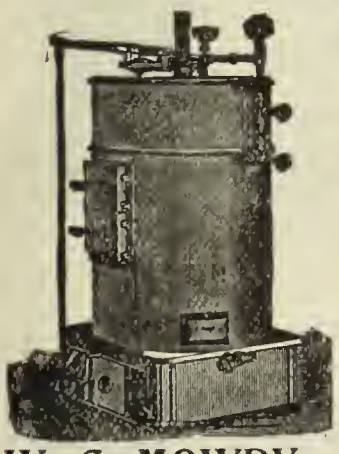
The "Perfect" Ventilator

The "Crown" or "Stasch" Folding Bake Pan.

Agents Wanted. Address—

The CORNING MANUFACTURING CO.,
CORNING, N. Y.

"JUST A LITTLE"



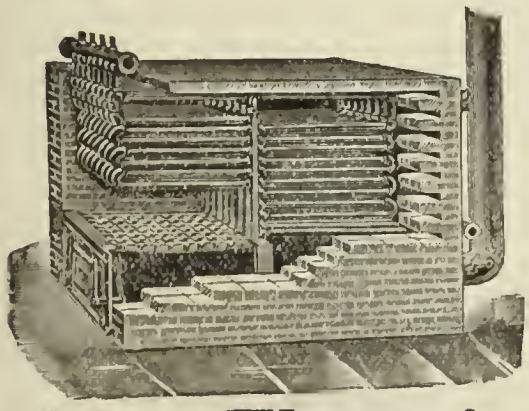
FUEL, TIME, CARE } TO { RUN IT. SET IT UP. MANAGE IT

That's all, and how it does heat!

WHAT? Why, the "PAGE."

Further information will cost you the time of writing for our catalogue—it's worth it.

W. C. MOWRY, Lock Box 314, NORWICH, CONN.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

Over 300 Different Sizes.

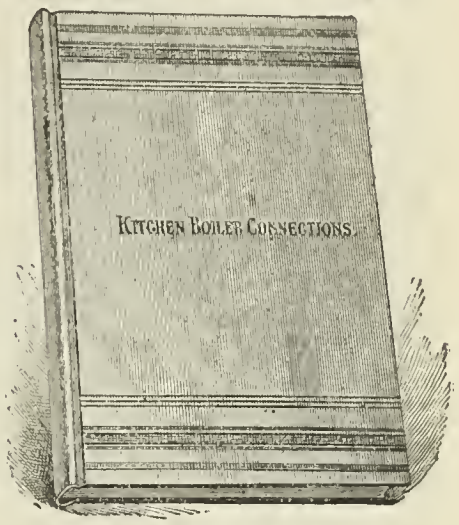
SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
15, 17, 19 ACHILLES ST., **ROCHESTER, N. Y.**
New York Office, 44 Dey Street.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth, Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student, and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

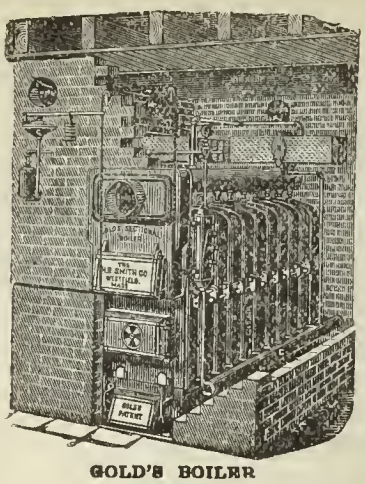
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

86-102 Reade St., New York.



GOLD'S BOILER

THE H. B. SMITH CO.,

MANUFACTURERS OF

Steam and Water

Heating Apparatus

FOR

PUBLIC BUILDINGS AND PRIVATE RESIDENCES.

SPECIALTIES:

Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
Reed's Improved Cast-Iron Radiators,
Gold's Indirect Pin Radiators,
Breckenridge's Patent Automatic Air Valves.
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for hard or soft coal.

Office & Warerooms, 137 Centre Street, New York.

FOUNDRY, WESTFIELD, MASS.

Catalogues Sent on Application.

STEAM HOT WATER WARM AIR

FOR HEATING ALL CLASSES OF BUILDINGS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

CAPITOL HEATERS

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best

—FOR—

Steam or Hot Water Heating.

—o—

Send for Catalogue.



The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

Packed Joints.

WATCH

FOR OUR

DISPLAY ANNOUNCEMENT

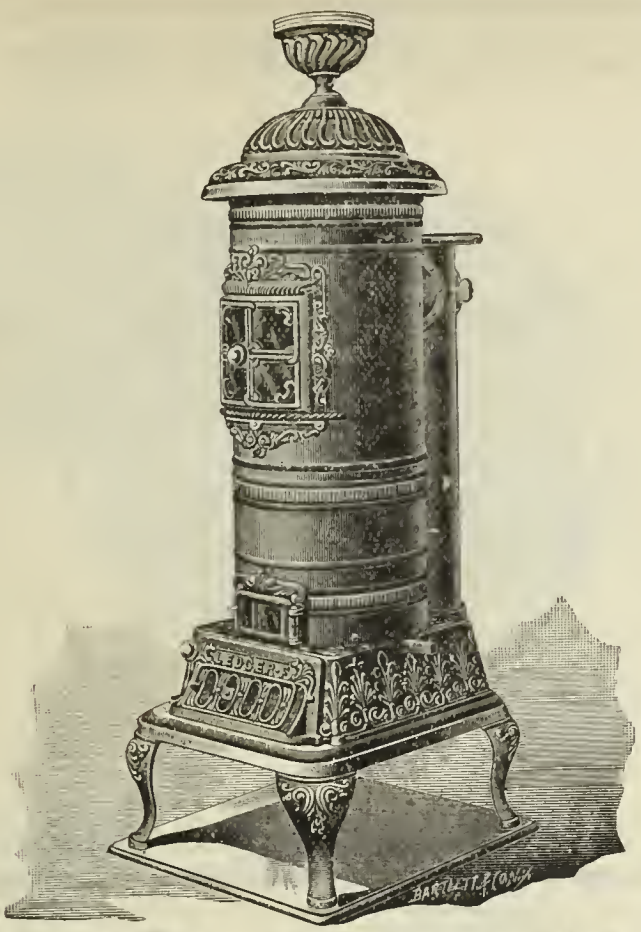
OF

The Portsmouth Stove and Range Co.,

Portsmouth, O.,

FLUSH RESERVOIR COOKS AND RANGES

IN NEXT ISSUE.



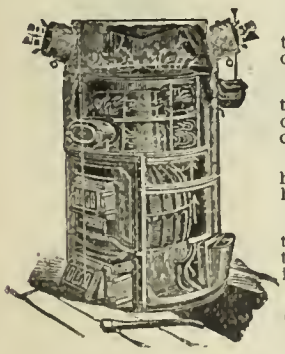
LEDGER F CYLINDER.

WITH REVERTIBLE FLUE. No. 9, No. 10, No. 12, No. 14.

Well made, attractive in appearance and attractive in price. Made both as a plain cylinder and with revertible flue as above. Circulars and prices are worth seeing. Send for them.

THE STAMFORD FOUNDRY COMPANY,

STAMFORD, CONN



WHY IS IT

that the same dealers who sold the **Boomer Furnace** five years ago are still continuing its sale?

DID YOU EVER STOP TO THINK

that one or two years' experience with a poorly constructed light furnace always creates a demand for a furnace that has proven to be the best in the full sense of the word?

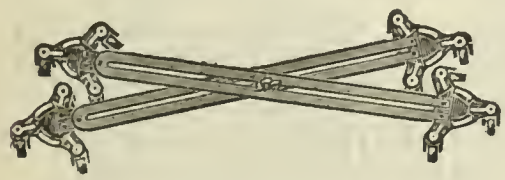
IF YOU WANT TO MAKE MONEY

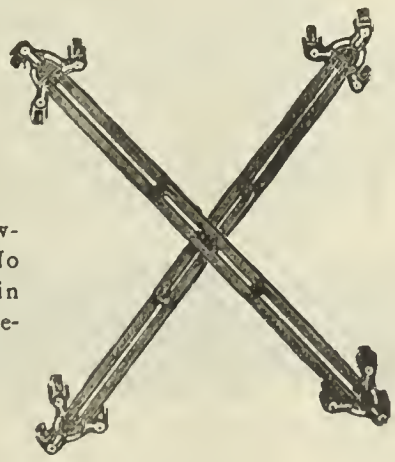
buy the Improved Boomer Furnace, set it up right, please your customer, and you have the key to your future success.

REMEMBER

that a Boomer Fire Pot has never been known to crack or burn out. That it has the simplest and most effective Gas and Smoke Burner. Guaranteed the heaviest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS. Massillon, Ohio.





THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.

MICA | MICA OF ALL GRADES —FOR— STOVES and Mechanical Purposes.

PALERMO MICA CO.,

Miners and Importers and Wholesale Dealers,

S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.

About Colds.

The season of colds, at least the season accepted as such, being upon us, it is well to remind ourselves that the best authorities ascribe the prevalence of these distempers to bad indoor air rather than to severe outdoor air. "Cold air," says a writer in a recent magazine, "does not cause throat and lung diseases, but only bad air." The fact that there is a marked increase in these diseases during cold weather he fits to his theory by declaring that such disorders are produced, not by the cold air but by the indoor life that accompanies the season."

"An open fire in every living room in every house," says another enthusiast on the same subject of ventilation, "would do more to lower the death rate from respiratory diseases than any medication or other existing remedial agency." Barring this, he urges frequent airing of rooms constantly occupied, but also insists that the ventilation be done on principles of common sense. "Steam heated rooms," pursues this carping critic, "particularly in apartments, usually reach a temperature of 80. This I may say is a mild statement. Any persons living in such places endure this or greater heat until it becomes intolerable, and then throw windows open recklessly. The temperature is lowered too suddenly, a chill is sure to follow, and often serious mischief. Why not take the pains with our own lives that a florist does with his plants? The air in a greenhouse is regulated by a thermometer, and kept even and pure without a sudden chill of overheating. It is the high temperature and bad air of our houses that have made a race of catarrhal wheezers, and not at all, I believe, climatic conditions."

American Cities One Hundred Years Ago.

The extraordinary growth of the chief American cities during the past century is thus illustrated by the New York *Evening Post:* When Washington was inaugurated Philadelphia, then the metropolis of the country, had only about 42,000 people, New York but 33,000, Boston 18,000, Baltimore 13,000, and no other city anywhere near 10,000. Even after the lapse of half a century, during which New York had overtaken Philadelphia, so that in 1840 it had 312,000 inhabitants to the latter city's 258,000, Baltimore and New Orleans were the only other places with more than 100,000 people, and except Boston with 93,000, all of the few remaining cities fell short of 50,000. During the formative period of the new nation, therefore, all but the merest fraction of its citizens lived in places of small population, the local affairs of which were easily administered through town meetings or other such simple machinery.

— A LESSON IN SPELLING.—She (at the desk): "Dear, please tell me how to spell costume. I'm writing to mother about my lovely new gown."

He: "Well, are you ready?"

She: "Yes."

He: "C-o-s-t, cost."

She: "Yes."

He: "T o, to."

She: "Well?"

He: "M e, me—$65, as yet unpaid."

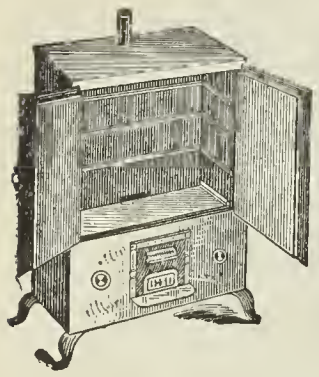
She: "You're a wretch."—*Frank Harrison's Magazine.*

— IN BETTER FORM.—Tom: "Why, Bessie, I could kiss you right under your mother's nose."

Bessie (with dignity): "I should very much prefer, sir, that you'd kiss me under my own nose."—*Scottish American.*

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



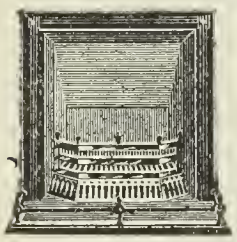
Hotels,
Steamships,
Confectioners,
Japanning,
Core Baking,
Public
Institutions,
&c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.
Burlington, Vt.

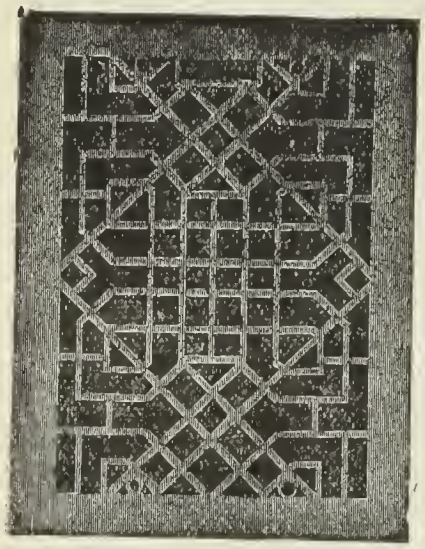


Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.



Warm-Air Registers, Ventilators, Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.



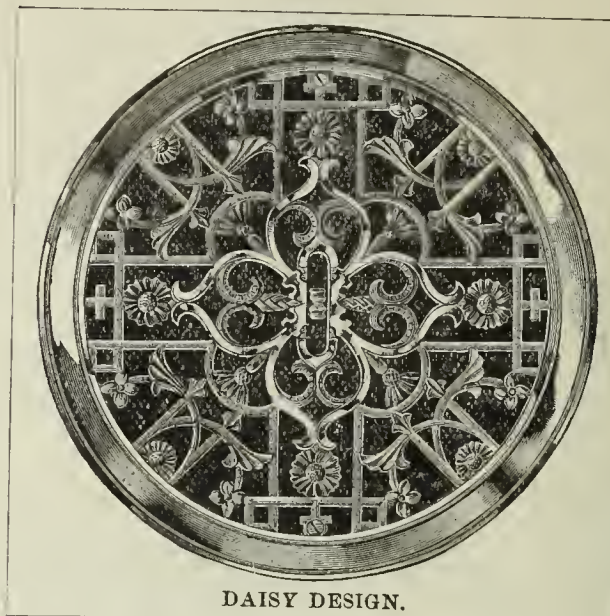
☞— CAUSE FOR SUSPICION: "We had better watch the bookkeeper a little," said the senior partner. "He has been buying a bicycle."

"But you can hardly call that an extravagance," said the junior partner.

"No; but it is likely to make him crooked."—*Indianapolis Journal.*

TUTTLE & BAILEY MFG. CO.,

REGISTERS, VENTILATORS, &c.



DAISY DESIGN.

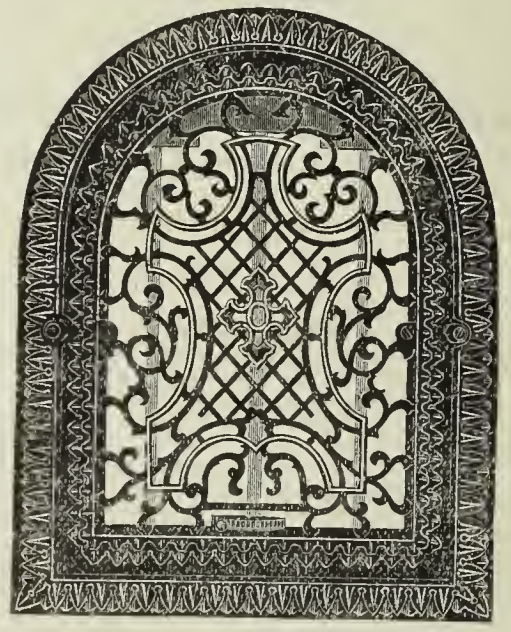
REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.

WM. HIGHTON & SONS,

MANUFACTURERS

Hot Air Registers,



CIRCULAR TOP REGISTER
With Wall Frame.

Ventilators, Etc.

BOSTON, MASS., - and - NASHUA, N. H.

The Packard Enameling Co.,



400 NORTH AVE.,
Warren, O.

—MANUFACTURERS OF—



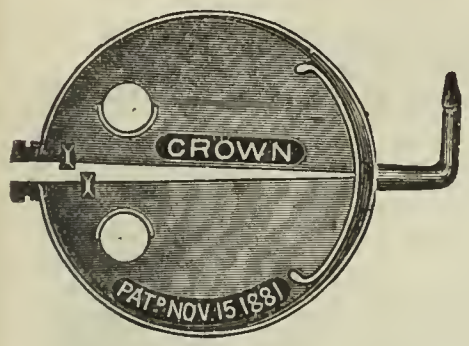
Plain, Stained and Enameled Handles, Knobs and Pail Woods.

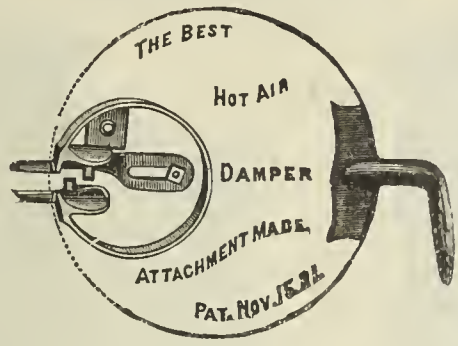
WRITE US FOR CATALOGUE AND PRICES. OUR WORK EXCELS.

BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, New York.

Crown Damper and Crown Damper Attachment.





NICKEL PLATED HANDLE. PUT UP 1 DOZ. IN A BOX.

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

AMERICAN Dampers and Clips.

WAFFLE IRONS.

THE BEST

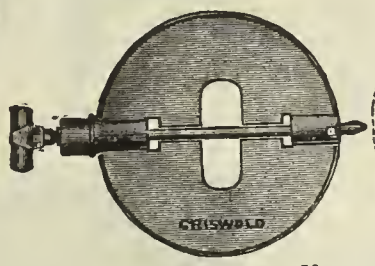


For Gas or Gasoline Stoves.

Easy to Clean, Long Wood Handles.

BUY *NO OTHER.*





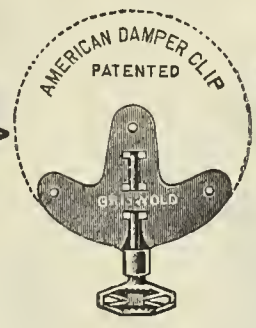
Wood or Nickel Handle.

BEST SELLER.

ASK FOR THE

AMERICAN.

Buy no Other.



JUST OUT.

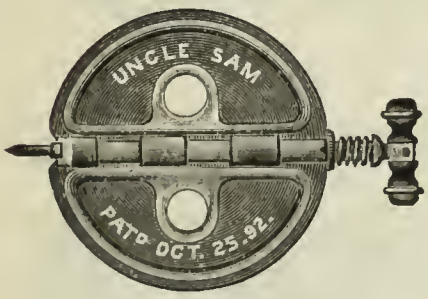
BEST CLIP MADE.

Send for Samples.

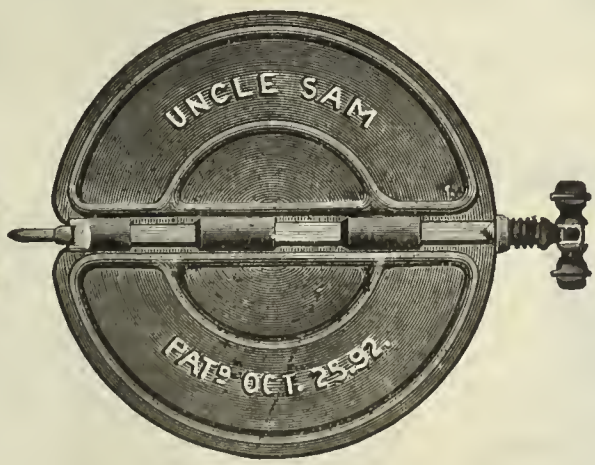
GRISWOLD MFG. CO.,

ERIE, PA.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

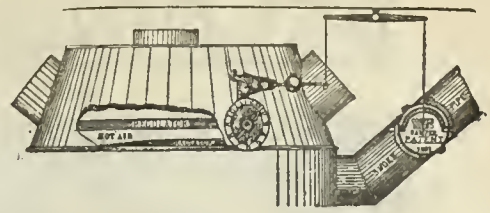
Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers

MICA

NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,

218 Water Street, NEW YORK.



I have the Best Automatic Furnace Regulator made up to the present time, and it is solid, durable and easy to put on. Damper with copper bearing. Wholesale and retail. Twelve years in use.

W. E. PUFFER.

8 PECK SLIP, NEW YORK.

NEW HAMPSHIRE

MICA

IS THE BEST.

The F. E. BELDEN MICA MINING CO.,

12 Broad St., Boston, Mass.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Propr.,
89 Fulton St., N. Y.

Snap Shots.

Civilization begins with soap.

The jumping off place is not always precipitous. It is sometimes a graceful and gradual incline.

The man who expects to lose rarely wins.

No useful man has to go back and rub out his unfortunate footprints.

A good way to help people is to refuse to speak unkindly of them.

A really good talker is one who never talks too much.

Some people marry for life and others just for a honeymoon.

It is not what people know, but what they think they know that is so dangerous.

It is the guilty man who cannot afford to be suspected.

A little learning is dangerous, but downright ignorance is even more disastrous.

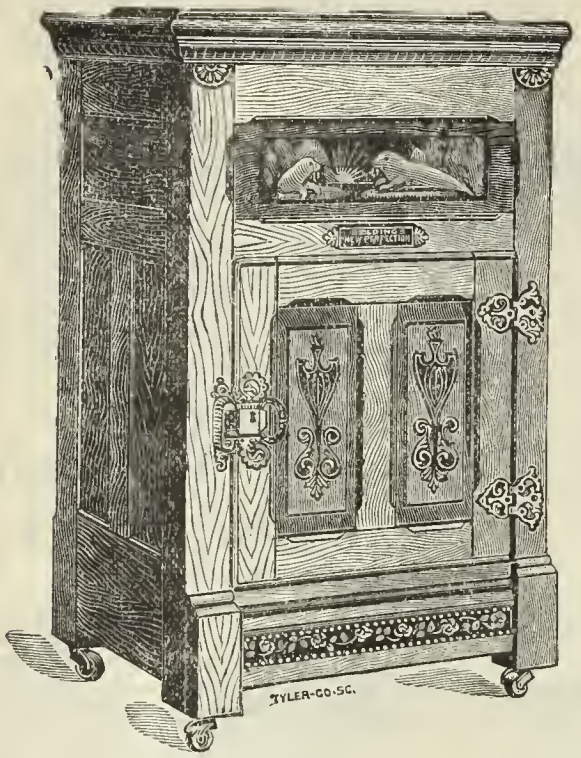
"Every dog has his day," and then wants somebody else's day.

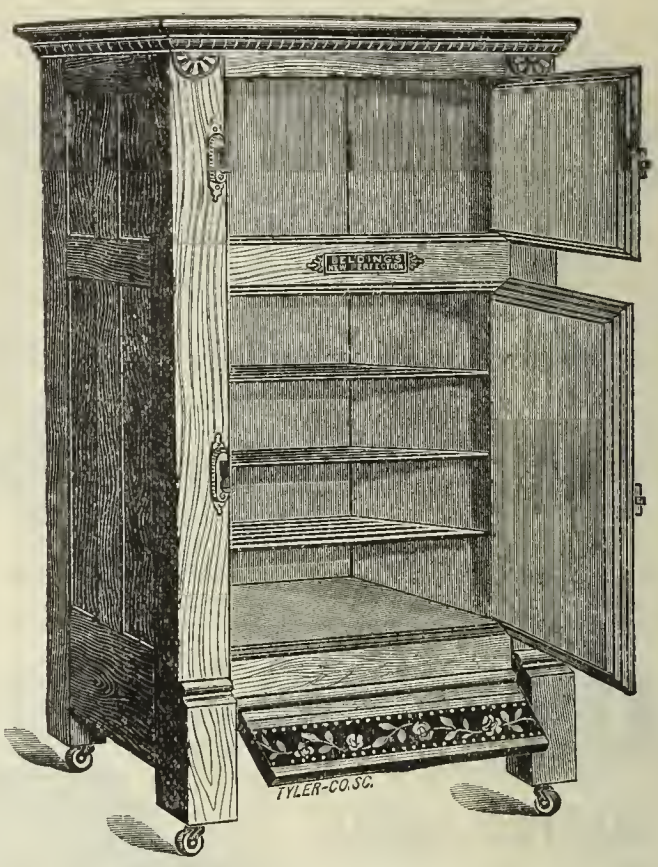
The greatest slaves on earth are the mortals who always follow their own inclinations.—*Dallas Galveston News.*

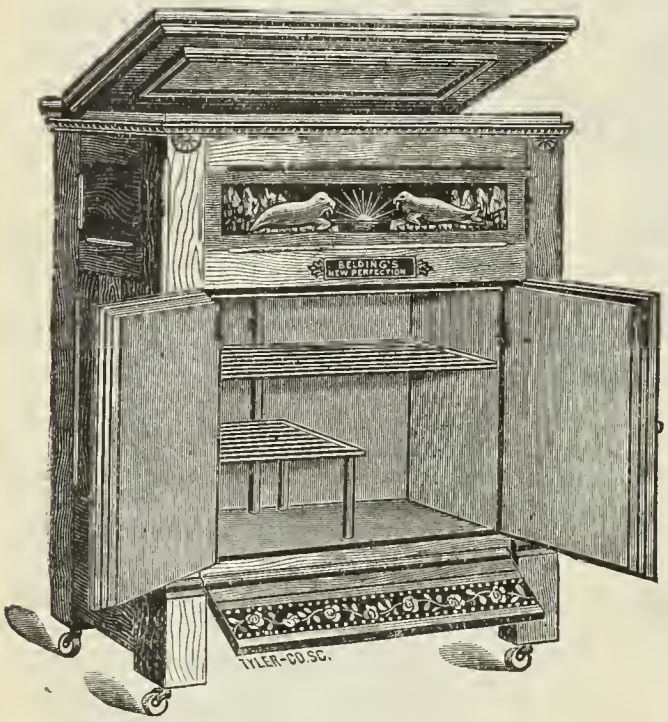
Men Who Have Come to the Fore.

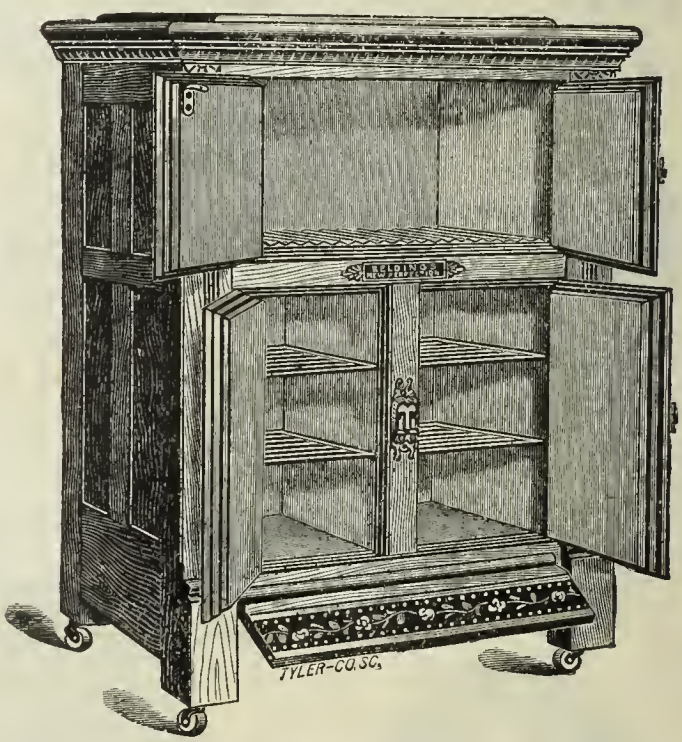
It is remarkable, observes the London *Iron and Coal Trades Review*, how very many of the greatest inventions and discoveries of modern times have been achieved by men who were not themselves trained to the business or profession in which they acquired distinction. Neither Bessemer nor Siemens was trained as a metallurgist, and yet they have been acclaimed as the most reactionary and epoch-making inventors in the whole history of the iron trade. Sir William Armstrong was not trained as an engineer, but as a solicitor, and yet he has revolutionized the art of gunnery and the manufacture of hydraulics. And so with many other modern instances. The so-called practical men are too often incapable of looking all round a subject, and are so wedded to usages and established rules as to look with serious disfavor upon any really novel idea, however meritorious.

BELDING'S REFRIGERATORS.

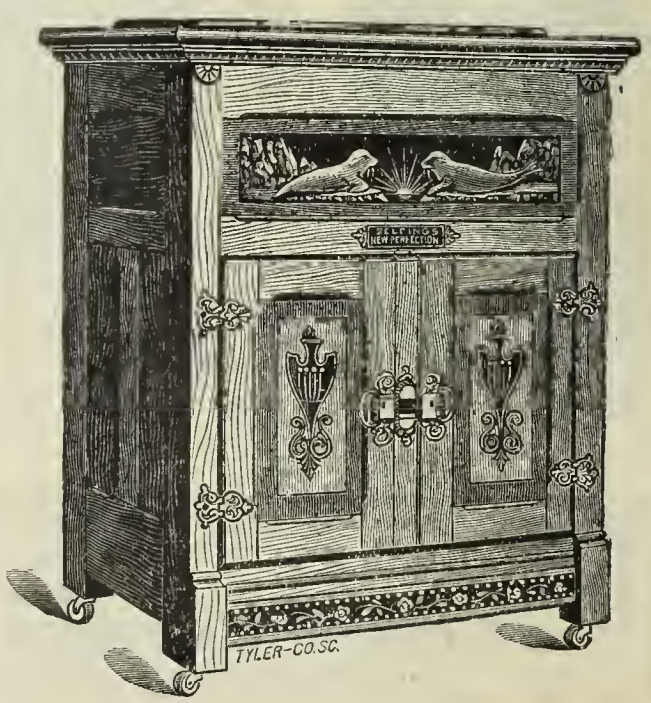




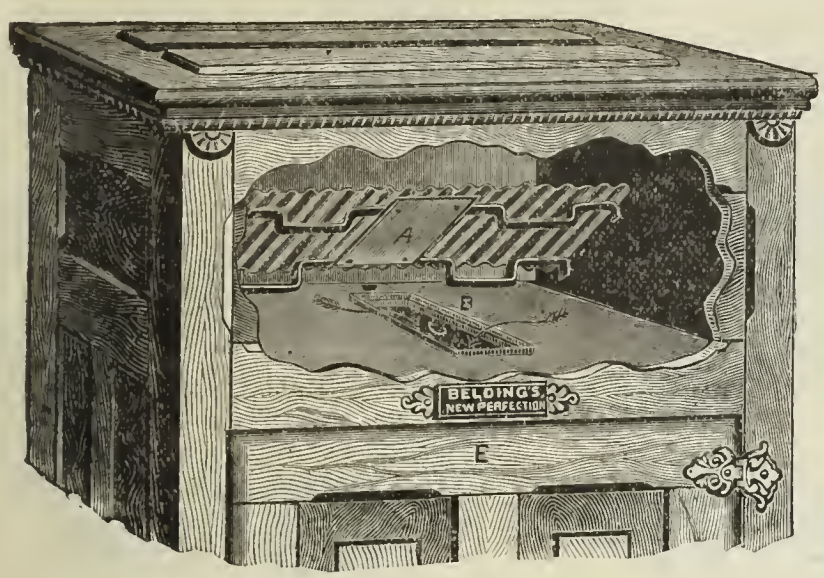




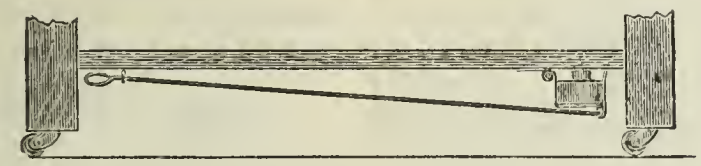


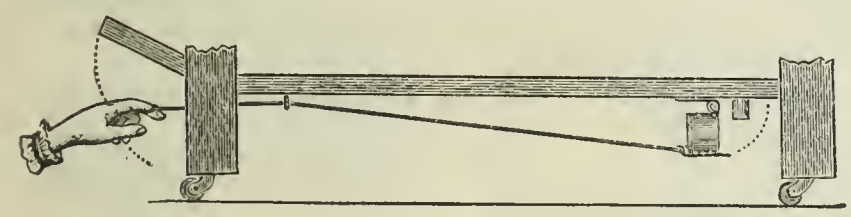


See Points of Excellence Over Others.



Patent Applied For.





OUR NEW AUTOMATIC COLD AIR DAMPER ATTACHMENTS.

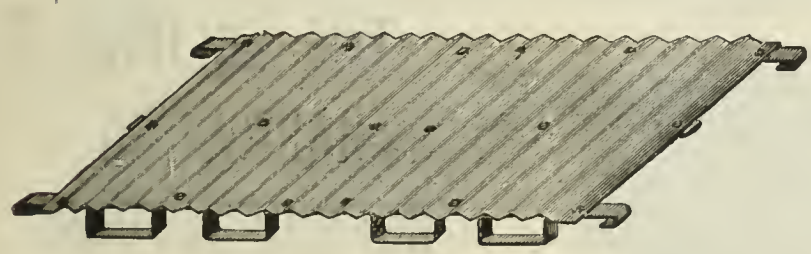
This cut shows a section of our Refrigerator with the New Automatic Cold Air Damper closed.

A—Represents Metal Ice Rack.
B—Bottom of Ice Compartment.
D—The **New Automatic Cold Air Damper.**
E—Door of Provision Chamber.

When the door of the Provision Chamber is opened the Cold Air Damper *immediatcly* closes the opening through which the cold air drops, thereby *instantly stopping the circulation* in the Refrigerator. Then, as the cold air in the Ice Compartment *cannot escape*, it is impossible for warm air to enter it through the flues in the sides of the Refrigerator; therefore, while the door of the Provision Chamber is open *no ice is wasted, no cold air escapes* and *no warm air enters* the Ice Compartment or *comes in contact with the ice.*

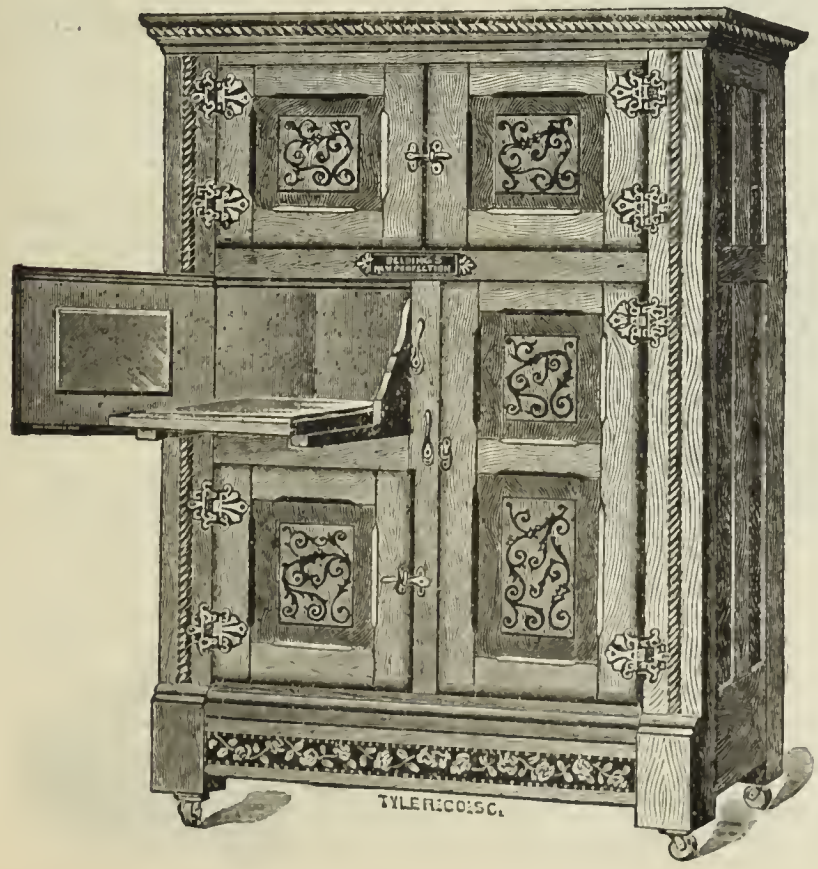
Thus it is clearly shown that this improvement is a *practical* one and makes our Refrigerators *consume less ice* than any that are now on the market.

OUR NEW DRIP CUP ATTACHMENT.



SOLID METAL ICE RACK.

No wood cleats to get water-soaked and tainted.



All refrigerators **hardwood, antique finish.** We carry large stocks at all of the following places:

Belding Manufacturing Company.

Factories, Belding, Mich.

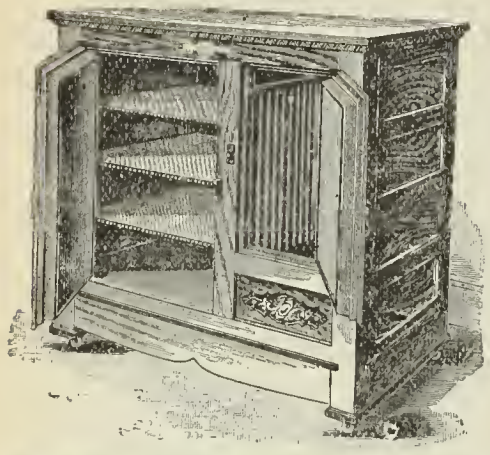
SALESROOMS AND WAREHOUSES:

Chicago, 223 5th Avenue.
New York, 260 Canal Street.
Philadelphia, 249 So. 2nd Street.
Boston, 90 Canal Street.
Holbrook, Merrill & Stetson, San Francisco and Sacramento, Cal., Pacific Coast Agents.
Omaha, Neb., 1009 and 1011 Jones St., Bobrecker Stove Co., Agents.

SEND FOR ILLUSTRATED CATALOGUE.

The Automatic Refrigerator

has more good points and does better work than any other and for that reason is a better seller. Our illustrated catalogue for 1895 tells all about the line. Its advantages are:



Perfect circulation.
Large condensing and purifying capacity.
It has no flues to cause it to smell bad.
The trap is inside where it cannot be misplaced or lost.
The drip pipe may be cleaned without disturbing anything in either chamber, and is entirely out of the way
It has nine walls to protect the ice and to maintain a uniform temperature in the cooling chamber.
It has woven wire provision shelves that are superior.
It has superior hardware.
It is more capacious and convenient.
Flavors of foods will not mix.
Last but not least, it's different, and will bring new customers and new trade.

We want the leading dealers to sell our goods and but one dealer in a place.
The goods are made of ash, and well finished.
We have two factories, one in the East and one in the West, and are able to take better care of your trade than if we had but one.
For catalogue and discount address:

Illinois Refrigerator Co,
909 Masonic Temple,
Chicago.
If West of Chicago.

Columbia Refrigerator Co.,
Northville,
Wayne Co., Mich.
If East of Chicago.



FROM DEALERS LOOKING FOR THE
Best Refrigerator Made
We solicit an opportunity of presenting the merits of our
"Wisconsin Peerless."
Mineral Wool Filling. Absolutely cleansable. More and better talking points than all other makes combined. Absolute guarantee. Seventh season.
For Catalogue address
The Wisconsin Refrigerator Co.
EAU CLAIRE, WIS.
New England Office,
175 Hanover Street, BOSTON, MASS.
Philadelphia Office,
Reeves & Smiley, 44 N. 4th St.

Making Life Easier for the Oppressed.

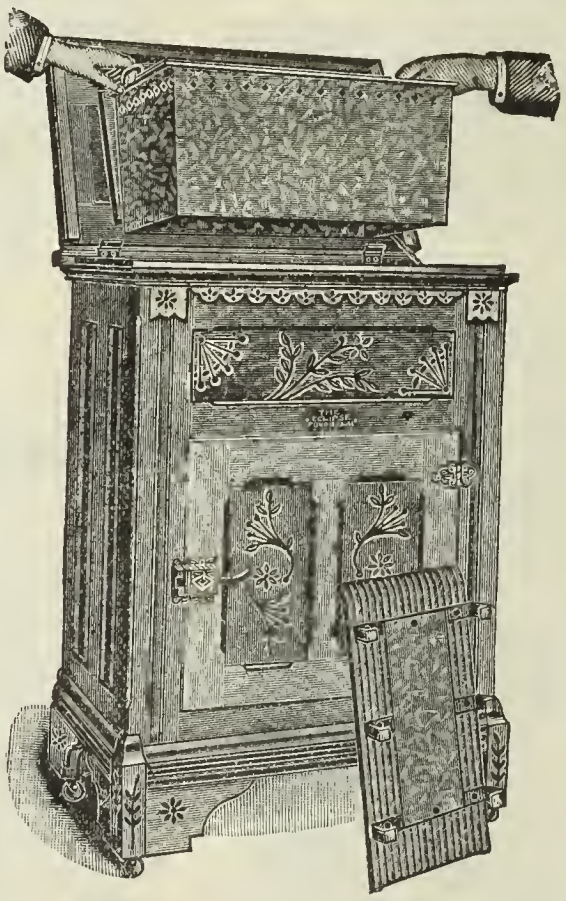
Here in America we have made history already. Some of it glorious, some of it ignoble; much of it made of the old stories told over again. We have learned some things that we did not expect to learn. We find that the social problems of Europe cannot be kept away from us by the quarantine of democracy. We find that the dead which the dead past cannot bury are thrown upon our shores. We find that weakness, misery and crime are still with us, and that wherever weakness is there is tyranny also. The essence of tyranny we have found lies not in the strength of the strong, but in the weakness of the weak. We find that in the free air of America there are still millions who can never be free—millions who can never be free under any government or under any laws, so long as they remain what they are. The remedy for oppression, then, is to bring in better men who cannot be oppressed. This is the remedy our fathers sought; we shall find no other. The problem of life is not to make life easier, but to make men stronger, so that no problem shall be beyond their solution. It will be a sad day for the republic when life is easy for ignorance, indolence and apathy.—*Exchange.*

— A MONEY MAKER.—Jones: "Well, if there is anything that has made money in the last two years, I'd like to know what it is."

Brown: "Give me a cigar and I'll tell you."

Jones (handing over the weed): "What is it?"

Brown: "The United States mint."—*Detroit Free Press.*



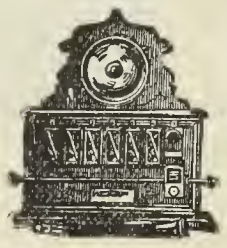
THE ECLIPSE HARDWOOD REFRIGERATORS.

Patented Separable and Removable Ice Compartment.

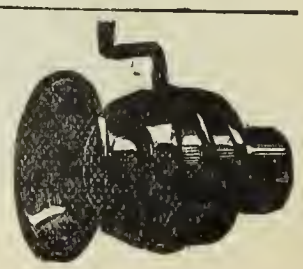
Can be kept perfectly clean with the least trouble.

It will pay you to write for Catalogue and secure the agency.

—THE—
Bowen Manufacturing Co.,
FOND DU LAC, WIS.,
SOLE MFRS.

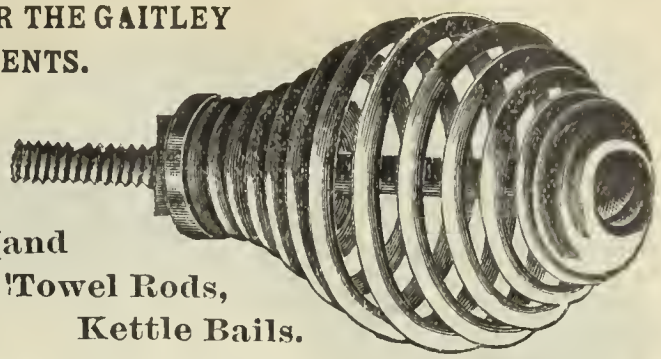


W. R. OSTRANDER & CO.,
204 FULTON STREET, NEW YORK.
Manufacturers of
Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.
Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application

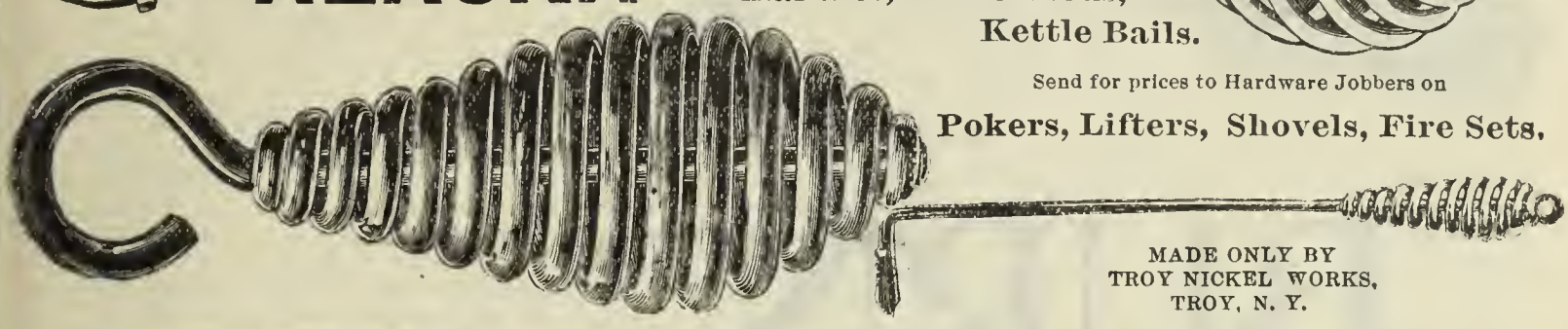




MADE UNDER THE GAITLEY PATENTS.



ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.



Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.

MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

"The Only Cleanable Refrigerator."



"Removable Galvanized Ice Compartment."

STYLE NOS. 125, 126 AND 127.

Gurney Patent REFRIGERATORS.

WE CLAIM FOR THE "GURNEY:"

"REMOVABLE GALVANIZED ICE COMPARTMENT."
"THE ONLY CLEANABLE REFRIGERATOR."
"CAN BE KEPT ABSOLUTELY PURE AND CLEAN FOR ALL TIME."
"THE LOWEST AVERAGE TEMPERATURE."
"THE GREATEST ECONOMY OF ICE."
"DRY AIR FREE CIRCULATION"
"PACKED WITH MINERAL WOOL (the best non-conductor.)"
"THE GREATEST SELLER."

The "Gurney" Proves what we Claim.

The following Jobbers will handle the Gurney for the Season of 1895:

The S. M. Howes Company, Boston, Mass.
A. W. Martin, Baltimore, Md.
Supplee Hardware Co., Philadelphia, Pa.
Bludley Hardware Co., Pittsburgh, Pa.
Frank Diel, Syracuse, N. Y.
McIntosh-Huntington Co., Cleveland, O.
Indianapolis Stove Co., Indianapolis, Ind.
Chicago Stove & Range Co., Chicago.
Freeman Delamater & Co., Detroit, Mich.
LLEWELLYN BONHAM, our New York representative, Room 52 Pierce Building, N. W. corner Hudson and Franklin Streets.
Robert Seeger, St. Paul, Minn.
A. J. Lindemann & Hoverson Co., Milwaukee, Wis.
King Hardware Co., Atlanta, Ga.
O. K. Stove & Range Co., Louisville, Ky.
Heckel Hardware Co., St. Louis, Mo.
Howard W. Peak, Fort Worth, Texas.
Richards & Conover Hardware Co., Kansas City, Mo.
Tolerton & Stetson Co., Sioux City, Iowa,
Rector & Wilhelmy Co., Omaha, Neb.
McDonald & Willson, Toronto, Ont.

We want a jobber in every distributing point in the United States, and a dealer in every town and city. Write for catalogue, terms and discounts, and secure the agency.

Gurney Refrigerator Co., Fond du Lac, Wis.

Ladd's Discount Book.

Price, $3.00; Double Indexed Edition, $4.00. Sent postpaid upon receipt of price, by

DAVID WILLIAMS, Bookseller and Publisher, - - - - - - - - 96-102 Reade Street, New York.



Patent applied for.

The Lightning Skate Sharpener.

With Key and Wrench Combined.

Is the Greatest Little Seller of the Age.

Every skater will buy one when shown. It is only necessary to get two or three out in the boys' hands to set the whole town wild for them.

They can be had of any of the following wholesale houses:

T. M. Roberts Supply House, Minneapolis.
Lewis Bros. & Co., Montreal, Quebec, Can.
Kerr & Robertson, St. John, N. B.
Roberts Stove & Hardware Co., Denver.
The Henry Sears Company, Chicago.
Wells & Nellegar Company, Chicago.
Hutch Cutlery Company, Buchanan, Mich., and 97 Chambers St. N. Y.
Hammacher & Delius, Exporters, N. Y. City.
Puritan Cycle Works, Portland, Me.
A. F. Shapleigh Hdw. Co., St. Louis, Mo.
The Strichter Hdw. Co., Reading, Pa.
G. A. Morton, Yarmouth, N. S.
Barrett Hdw. Co., Joliet, Ill.
Ruth & Stone, 57-60 Wilshire Bldg., Cleveland, Ohio.
Butte Hdw. Co., Butte, Mont.
Wyeth Hdw. & Mfg. Co., St. Joseph, Mo.

Manufactured by

SANDWICH NOVELTY CO., Sandwich, Ill.

ROYAL

WASH BOILER HANDLE.



PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,
116 N. 2d St., PHILADELPHIA, PA.

HOWARD FURNACES

BURN SOFT COAL

MAIN OFFICE and WORKS, SYRACUSE, N. Y.

Branches: NEW YORK, BOSTON, GRAND RAPIDS, TORONTO.

TO A WONDERFUL DEGREE OF PERFECTION WITHOUT GENERATING A LARGE VOLUME OF SMOKE.

FOR SALE BY

HOWARD FURNACE CO.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 26, 1895.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 4.
Index to Reading Matter.....Page 58.

Convention of Heating Engineers.

The first convention of the American Society of Heating and Ventilating Engineers, which was held this week at the house of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York, was in every way a success. The attendance was large and representative. The papers submitted were of a high grade and secured close attention. The subjects for topical discussion were varied in scope, and the experiences related in discussing them were of an instructive character. The business of the society, as well as the discussion, was carried on with dignity, and a deep interest was manifested in establishing the society on a basis that would insure its permanency. A reading of the proceedings, which appear elsewhere, will enable an opinion to be formed as to the probability of success on this point. The society gives great promise of being very useful, and it has the best wishes of many friends for a long life.

Gumption.

How expressive is the word gumption, how evident in its meaning and yet how almost indefinable! Certainly it is skill, it is cleverness, it is sagacity, but it is more than one or all of these. Perhaps the skillful application of common-sense or the common-sense application of skill will define it. At all events it is assumed to be one of the characteristics of the true born Yankee and is an intangible something that turns failure into success. To a large degree a man of gumption is born, not made, but there is nevertheless ample opportunity to acquire this trait so desirable to the artisan. It can come only by perseverance and determination. It has nothing to do with a give-up-at-once spirit, which is displayed by so many individuals the moment they encounter an obstacle. One or two instances may serve to illustrate. A certain sheet iron worker was sent out to erect a system of galvanized iron piping. Running against a snag, he returned at once (some 50 miles) to see what he should do. His course was pointed out to him by the foreman in a somewhat emphatic manner and he returned to his work fully confident that he knew just what to do; but no sooner did he undertake it than his understanding deserted him, he could neither understandingly remember nor practically apply the instructions given and returned to the shop a second time. Very naturally he was kept at home (what was said to him need not be mentioned here). A substitute was sent, however, and upon his departure was asked what he proposed to do. His reply was that "he proposed to fix it," and fix it he did. He was by no means a better workman than the first, but he possessed a faculty which his predecessor absolutely lacked.

Horse Sense.

Again, a man was sent out upon the same kind of a job, and finding something to prevent his putting it up as originally designed, immediately telegraphed home that he could do nothing, as things were wrong. But he neither informed them wherein they were wrong, nor did he start for home and straighten things out, but actually waited until some one else had followed it up and settled the difficulty. Horse sense, as something akin to gumption, would appear to have been the missing faculty in this case. Doubtless no class of men has been called upon to exercise the most consummate gumption at shorter notice or under more trying circumstances than the old time millwrights. An entire mill might be shut down until their work was completed. The work must be done with the greatest haste, and yet it must be well done. All of a man's resources must be called upon, experience first and then ingenuity. And wonderful things have these men of gumption accomplished with the crudest of material and appliances. The mechanic of to-day may well admire their work and seek such a reputation for true gumption as they possessed.

Future Tinners.

A salesman who had served an apprenticeship as a plumber was very positive in his assertion that in the near future tinsmiths would be in greater demand than plumbers. His reason for the assertion was that innumerable boys were learning the plumbing and other trades and none were learning to be thorough, competent tinsmiths. He dilated on the fact that no small intelligence was required to be a tinsmith who could cut a pattern for any job that came to hand, and stated that in tin work a fine show of handicraft could be made. In the matter of variety of work presented, he thought no trade called for a greater amount of good judgment and widely adaptable characteristics. The tinsmith must be a good roofer, working to the best advantage in time and material, and through being a master of the art make roofs that would stay on without leaks or repairs. This same man must work sheet iron of all gauges with facility into stoves, furnaces and their many attendant requisites, besides knowing all about how to do a job that would give a strong heat and satisfaction. Without having any practice, as in old times, in making tinware, he must make neatly odd shaped vessels of a given capacity for special requirements, necessitating calculations that would puzzle a schoolmaster. It takes years to make a tinsmith, and it is always some new problem in head or hand work or policy that is being presented. Men who fill the bill thoroughly have acquired the wisdom and patience of a philosopher. The young man, however, who considers the trade of tinsmithing thoroughly will either be fascinated with its problems, or, disgusted with the demands that will be made upon mind and muscle, he will turn to some business where for the same or a smaller investment he can reap a greater remuneration.

Steps are being taken for the equipment of two short lines of the New York, New Haven & Hartford Railroad system with electric motors. The two lines are the Nantasket Beach and the Warren & Bristol, and if the experiment proves a success it is understood that electricity may largely supersede steam as the motive power on the railroad at no distant date. The current for these lines will be supplied by power houses —one located at Warren, which will run the cars from Providence to Fall River, including the Bristol branch, and another at Westport factory on the New Bedford line. Both open and closed cars will be used on this line, which is 35 miles in length, and when completed will be the most important and thoroughly equipped electric road in the country.

Appeals for aid are made on behalf of the settlers in North Dakota and Nebraska who are, in many places, entirely destitute, on account of the failure of their crops. Thousands in that section of the country are said to be starving and freezing for want of food, fuel and clothing.

THE LETTER BOX.

Brazing Cast Brass.

From S. E. B., *Chicago.*—I want to find out how to braze a cast brass boss on to a 2 inch wrought iron pipe. The boss is heavy brass and it is to receive a ½-inch cock. It is a job on a locomotive and has to stand steam. I have tried to do the work with spelter in the following way: I first filed the brass and iron pipe, then put the boss in place and bound it with a piece of heavy wire; then put in a forge with a clean fire, got up a heat and applied the spelter with borax, but it did not hold. The spelter did not melt, though I gave it pretty nearly a red heat. I thought it was hot enough, as spelter is supposed to melt at 467°. Is there more than one kind of spelter?

Answer.—We submitted this letter to John Fuller, Sr., author of the "Art of Coppersmithing," who writes as follows: The above inquiry, as is often the case, is very indefinite, and leaves us to guess where the difficulty is. There are so many mixtures called brass, and things called bosses, that we are from the nature of the case compelled to use our imagination and assume a form for the boss as well as its position

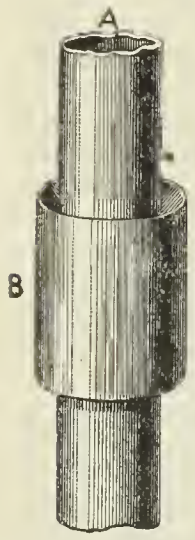


Fig. 1.—Pipe and Boss.

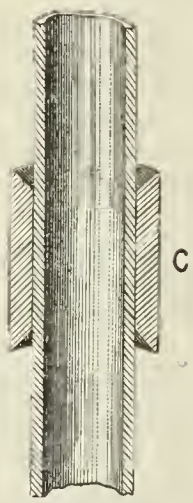


Fig. 2.—Sectional View.

Brazing Cast Brass.

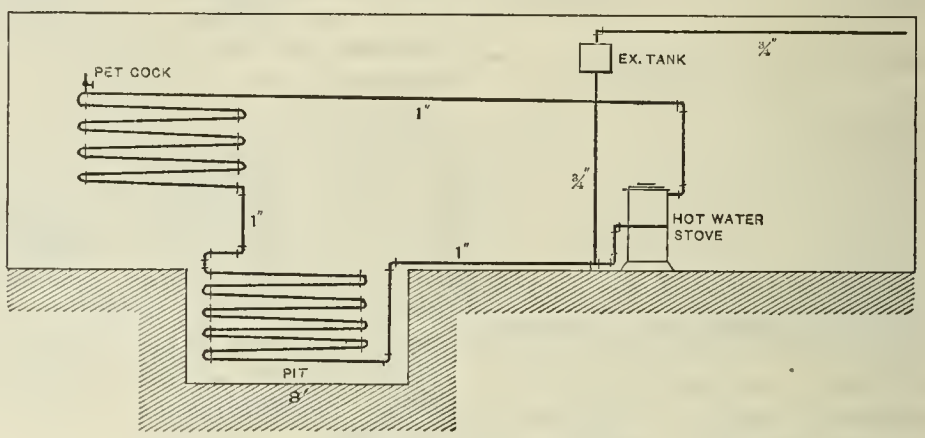
on the pipe. We will first consider the boss. To successfully braze or solder this boss the spelter should be made to suit it or the composition of the boss to suit the spelter. The ordinary solder is composed of 16 parts copper and 12 of zinc; therefore it is necessary the boss should have enough more copper in its composition to allow the solder to run free and easily on it without fear of fretting. If the boss is already supplied it should be tested by trying to run some of the spelter on it before it is placed in position for brazing. If it requires more heat than the boss will stand without fretting, then lower the solder until it will run readily. (Complete directions are given for doing this at page 248 in my work, "Art of Coppersmithing.") When the boss and solder have been tested and both proved satisfactory, the boss should then be prepared for the soldering. To illustrate: Let A, Fig. 1, represent a 2-inch iron pipe and B the boss 6 inches long and ⅛ inch thick. Now clean the pipe free from scale, and have the boss bored out so that it will fit the pipe tight, and have a channel or countersink made at each end of the boss ⅛ inch deep, as shown at C, Fig. 2, leaving the outer edge of the boss about ⅛ inch thick. Now stand the pipe securely in a convenient place near to the blast and proceed to set the fire pot as shown on pages 178 and 179 of the "Art of Coppersmithing" and proceed as there directed. If a boss or a brass elbow is to be placed on the end of the pipe, then the weight of the pipe should be taken off by slinging to a chain, as shown on page 181. It would seem from the correspondent's letter that he did not apply sufficient heat to run his spelter, or was afraid the boss would not bear the heat necessary, hence his failure. This can always be avoided by testing the quality of the things it is desired to solder with spelter, and then lowering the solder to suit when necessary, or by raising the quality of the brass to be operated on. If the above suggestions are acted on with ordinary ability success must follow. We shall be glad to hear from "S. E. B." again on this subject with details as to his success.

Evans Hot Air Furnace.

From J. J. B., *Philadelphia.*—In answer to "B. C.," New York, whose inquiry appears is *The Metal Worker*, January 5, the Evans hot air furnace is made by Evans & Co., Twelfth street, below Spring Garden street, Philadelphia.

Will It Circulate?

From F. D., *Salem, Mass.*—Will some reader of *The Metal Worker* please inform me if a hot water job as shown in the sketch will work, or if there is any better method of piping the job than that shown in the diagram? What I am trying to get is a coil under a printing press so as to keep the ink rollers warm, having the heater on the floor



Will it Circulate?

above the pit at one side. I wish the water to circulate through the coil in the pit after passing through the coil on the wall.

Flux for Soldering Zinc.

From C. M. W., *Spencerport, N. Y.*—In reply to "C. S. Z.," whose letter appeared in *The Metal Worker* of January 19, would say that for new zinc that is not corroded in the least tallow makes an excellent flux. It can be wiped off the work while warm and will not corrode the metal if left on. I hope this will help some of the readers of the Letter Box, from which I have often got assistance.

From A. L JAMESON, *Warren, Ohio.*—If "J. S. Z." of Richmond, Ind., whose inquiry appeared in *The Metal Worker* of January 19, desires, I will send him a sample of flux for soldering zinc and galvanized iron or for tinning black iron that will not discolor the work nor hurt either hands or clothing, for there is no acid in it.

Newark Parlor Stove.

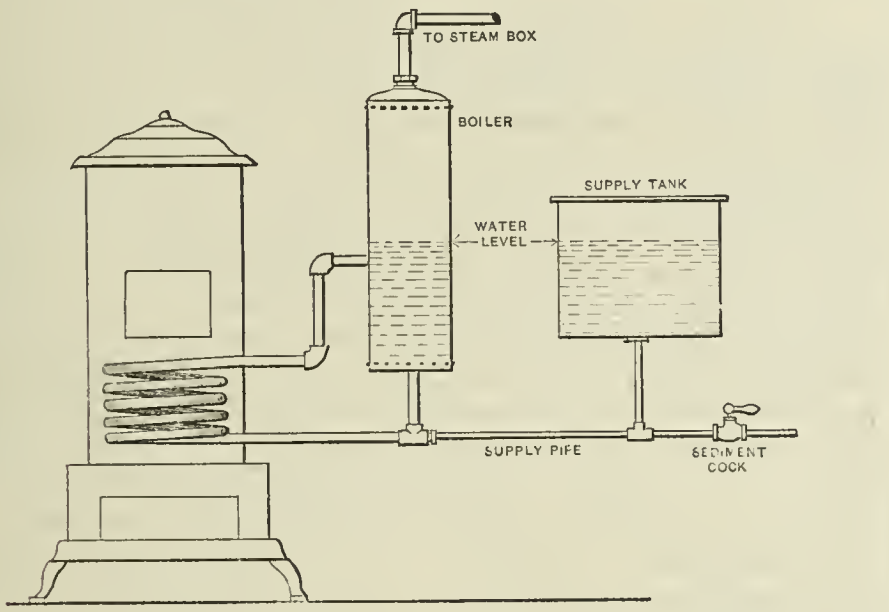
From L. R., *West Troy.*—Will some one tell me who makes the Newark parlor stove No. 58? I have a catalogue of 8000 stoves made in the United States, but the one mentioned above is not in it There is a Newark stove made by G. H. Phillips & Co., but that is not the one.

Boat Builders' Steam Box.

From B. R. C., *Moriches, N. Y.*—I give herewith a diagram of an apparatus for the purpose of generating steam for a boat builders' box, and I would like to know if it is constructed on the right principle for the purpose. I argue

that it is, but it has failed to give satisfaction. The stove has a coil in it made of 20 feet of 1¼ inch pipe connected to the boiler. The boiler is about 8 inches in diameter snd 24 inches in hight, connected with the heating coil by 1¼-inch pipe. The water is taken to the boiler from a supply tank through a ¾-inch pipe. The cause for complaint is that the water in the supply tank boils, to which the owner objects. I have suggested that by placing a check valve in the ¾-inch supply it will stop the trouble and add to the efficiency of the apparatus in generating steam. To this he objects, as he thinks it would make but little difference in the steam generation and would prevent him from drawing water off through the sediment cock to prevent freezing. I shall be glad to receive some explanation as to how to overcome the trouble.

Answer.—There is much more surface in the heating coil than is needed to make steam in a boiler of the dimensions given. A check valve will relieve the trouble. By using a draw off cock on both sides of the check valve the apparatus can be drained. The arrangement of the plant seems to be correct. Comments from our correspondents are invited.



Boat Builders' Steam Box.

Railroads and Manufacturers.

The satisfactory adjustment of Western freight rates on stoves and agricultural implements, says *The Iron Age*, furnishes manufacturers in other lines an impressive example. Here is an instance in which determination and persistence have overcome the stubborn decision of not a few, but a large number, of railroad managers to advance freight rates. To secure the reconsideration of a step which had been formally ratified by one of the most important railroad associations of the country was a formidable undertaking. It was necessary to convince a majority of the railroad companies composing the association of the injustice of the proposed changes. Then a special meeting had to be called, at which the matter was again discussed, with the chances in favor of a change of heart after the representatives of the railroad companies got together. But the stove and implement manufacturers went to work with a will, and brought to their assistance allied business interests throughout the whole section affected by the proposed increase. Some of the manufacturers also laid aside their private business for the time and devoted their entire attention to the task of winning railroad managers to see the question from the standpoint of railroad patrons. The arduous service rendered by these individuals will perhaps not be appreciated by very many of their trade colleagues, but it was effective in securing final action. The benefit of this achievement is not merely confined to the settlement of the one question involved, but is likely to be felt in the future. The railroad companies will probably consider much more carefully any proposed readjustment of freight charges or changes of classification on stoves and agricultural implements.

Let the same untiring, unrelenting policy be pursued with regard to other grievances from which manufacturers are suffering at the hands of railroad companies. The assistance of friendly interests should be invoked in order to bring about as great pressure as possible, so that every day will be a burden to the railroad manager who persists in unjustly treating manufacturers. A special case in point is that of the freight rates on tin plate. The discrimination in favor of foreign tin plates should be the subject of continuous attack. The railroad companies participating in the establishment of a low through rate from Swansea to interior American points should be compelled to face the consideration of this question every day until they conclude to give American tin plate manufacturers fair treatment. An occasional newspaper article or an occasional letter to a railroad company will help to agitate the question, but it will not accomplish the purpose sought, and that is a complete reversal of the practice. Perhaps the damage which it is doing might have been checked long ago if a few of those immediately interested had dropped everything else for a time in order to handle this one matter effectively. Other grievances exist which should not be endured, and perhaps in every case it will be found that the only reason why they continue is because insufficient pressure has been brought to bear upon the officials who are responsible for them. The rate on coke from the Connellsville region to Chicago is a grievance of particularly long standing. Freight rates on other commodities have fallen, but this rate has stood immutable for years and years, as though fixed by some power higher than that of man. Although every foundryman in the Northwest is directly interested in the question of coke freight, it is left to the attention of the few pig iron producers. A reduction of 10 cents per ton is expected on February 1, it is true, but this is merely a sop which might have been made an important concession if a more vigorous policy had been inaugurated and followed up unremittingly by the consuming interests and allied trades. If the matter of freight rates were capable of exact adjustment on some definite or comprehensible system which was being rigidly followed, agitation of this character would not be needed. But as long as they are fixed arbitrarily, the patrons of the railroads must be more than watchful of their own interests. They should be persistently aggressive.

In a paper lately read before the British Royal Society, J. H. Gray and J. B. Henderson state that the density of a well annealed copper wire of 98 per cent. conductivity decreased about ⅛ per cent. if stretched 25 or 26 per cent. A lead wire also decreases about ⅛ per cent. just before breaking. A copper wire drawn through 12 holes of a draw plate increases in density more than 1 per cent. A manganese copper wire—10 per cent. of manganese—increases in density about 1 per cent. when drawn down to half its former diameter.

A Light and Heat Exhibition is to be opened in London next May. It will be located at Woodhouse Park, Shepherd's Bush, and all methods of heating and lighting will be illustrated. A historical gallery will furnish examples of lighting and heating from the earliest ages up to the present time.

The serious depreciation which has taken place of late in the values of agricultural products is reflected in an official statement recently published, which gives returns from 62 counties in Ohio showing that 1,000,000 acres of land changed hands last year, at a decrease of $3,000,000 from the preceding year's valuation, and that mortgage indebtedness in the same district increased 65 per cent.

The East St. Louis and St. Louis Bridge and Construction Company have been incorporated, with $500,000 capital, to build another bridge across the Mississippi River.

STEAM AND HOT WATER.

First Annual Convention of the American Society of Heating and Ventilating Engineers.

TUESDAY MORNING.

The first annual convention of the American Society of Heating and Ventilating Engineers was held in the auditorium of the Mechanical Engineers' building at 12 West Thirty-first street, New York, on January 22. At 11.15 President E. P. Bates called the meeting to order, the following members being present or arriving later:

Henry Adams, Washington, D. C.
Hugh J. Barron, New York.
Edward P. Bates, Syracuse, N. Y.
J. J. Blackmore, New York.
B. Harold Carpenter, Wilkes-Barre, Pa.
Geo. B. Cobb, New York.
Albert A. Cryer, New York.
A. C. Edgar, Philadelphia.
John A. Fish, Boston, Mass.
Frank W. Foster, Boston, Mass.
James A. Harding, Boston, Mass.
L. H. Hart, New York.
Alfred A. Hunting, Boston, Mass.
Stewart A. Jellett, Philadelphia.
Major H. E. Light, Saginaw, Mich.
W. M. Mackay, New York.
Wm. McMannis, New York.
Percival H. Seward, New York.
J. R. Wendover, New York.
J. J. Wilson, Baltimore.
W. A. Russell, New York.
Jos. M. Stoughton, New York.
Le Roy B. Sherman, New York.
W. B. Wilkinson, New York.
T. B. Cryer, New York.
Wm. H. Hill, New York.
Samuel Burns, New York.
C. C. Lincoln, New York.
W. J. Baldwin, New York.
N. P. Andrus, Brooklyn.
Chas. S. Onderdonk, Philadelphia.
Chas. S. Hopkins, Rochester, N. Y.
A. G. Paul, Boston.
A. J. Doty, New York.
Geo. T. Weymouth, Jr., Scranton, Pa.
W. H. Oakes.
Walter Pendleton, New York.
C. S. Graves, New York.
W. H. Clark, Lebanon, Pa.
D. M. Quay, Chicago.
B. F. Stangland, New York.
Thomas Barwich, New York.
Robert Munro, Chicago.
J. G. Dudley, New York.
E. R. Burroughs. Geneva, N. Y.
D. U. Cory, New York.
C. B. Boynton, New York.
W. H. Dewey, New York.
Fred. P. Smith, New York.
Wm. P. Skiffington, New York.
Thomas McNeill, New York.
Judson A. Goodrich, New York.
Albert A. Cary, New York.
N. A. Boynton, New York.
F. A. Herendeen, Geneva, N. Y.
T. Joy, New York.
C. F. Hauss, New York.
J. L. Wells, New York.

After disposing of the minutes, President Bates delivered the following address:

President's Address.

Gentlemen, Members of the American Society of Heating and Ventilating Engineers: I welcome you to this our first annual meeting. The purposes for which this society was formed are commendable in every respect. If we carry out the wise provisions which are named in the preamble to our constitution and by-laws we shall become public benefactors. We need to look backward but a very few years to find that our profession was unknown. The rapid strides of modern civilization have created many new professions, and ours among them. There is a wide field open before us, and it yet remains to be seen how well we will occupy it. The child is born, and it gives great promise of a grand future. I notice the following in the third clause of the preamble: "The maintenance of a high professional standard among heating and ventilating engineers." This is the proper basis on which to found this society. In order to carry out these sentiments we need to gather about us men devoted to the work, men of character and reasonably ambitious of success; men who will think, study and work until they see the fruition of their hopes. We need also in this infantile state to avoid adding to our number any who are not already engineers in our acceptation of the word. In a new society there is always a temptation to get numbers. This is commendable provided you confine your efforts to those fully qualified to associate themselves with you; those whose interests are identical with yours. I would prefer to work with a society that only counted ten members, and that ten fully banded together for a purpose, than to number a thousand and have divided interests. Many of us are still interested in contracting and mechanical construction. But as eligible members of this society, we can well afford to lay that aside for a day and look at heating and ventilating from a professional standpoint only. I now charge you as you love the cause in which you have so recently launched your bark to look well to your applications for membership, as the growth and perpetuity of this society rest upon this fully as much as on any other proposition. In regard to legislation which may in future be shaped by this society, I would say that the field is broad and but little occupied. The State of Massachusetts seems to have taken the initiative in enacting wise laws regulating the construction and ventilating of public buildings. Those laws are too voluminous to quote from at this time, but I would suggest that each member possess a copy of them, and become thoroughly familiar with their text. I believe that we should not cease our labors when public buildings are thoroughly warmed and ventilated, but our zeal for a good cause should eventually take us into every building which shall be constructed for any purpose. When any class of men have given continued study to a certain subject and have evolved a practical line of action it is not the time to sit idly by and fold their hands in self complacency, but this knowledge should be given to the world, forced on them against their will possibly in the beginning, but received with gratitude when the service is partially appreciated. There are cases where factories and workshops are fairly well ventilated, but in comparison they are rare. This is not always because the owner is unwilling to ventilate his building, but usually because he has not given the subject any attention. He is probably engrossed in the details of his business and would not know how to begin if he wished to ventilate his building. At this point a member of our society could render him an important service. There is another class of buildings which need our attention, but so far as I have been advised have been largely overlooked as of little consequence; I refer to the tenement houses in our large cities. You may hold that in the majority of cases the occupant does not desire any ventilation, but this does not affect the merits of the case. We should take the matter in hand and bring out a system which will be for the good of the masses. Every family has the right to have an abundance of good fresh air, even if they are not aware of their right. I hereby suggest that this be one of the first problems which we handle, and if possible we secure such legislation as will compel every person or corporation who shall in future erect a tenement house to connect each room to an individual ventilation shaft to be not less than 8 inches in diameter inside, round in form and preferably of glazed tile built in the walls of the building. You may think this a trifling matter, but I assure you that if we as members of this society accomplish this much within the next ten years and do not make any advance along any other line we shall have achieved a glorious return for our labors. We shall find, however, that we cannot labor for those of our race who live in the most humble homes without having our work redound to the benefit of the entire race. Ventilation comes next to godliness and must necessarily precede the manifestation of the latter. So I hold that in the next decade one of the human benefactors will be the men or the body of men who make it possible for their fellow men to be more cleanly in their surroundings. Our work, however, will not stay with any class; it will benefit all classes, and the amount of benefit received will be commensurate with the

labor expended upon it. In order to carry out all the objects of this society we shall need first the hearty co-operation of all its members; we shall need further a practical and intelligent devotion to the purposes for which we are organized. With these points carefully covered by each member, there is a work before us which never has been thoroughly done, but will be accomplished by the members of this society to their credit and the good of the race.

Report of Secretary.

Secretary L. H. Hart then read a report stating that there was a membership of 75, a number of new members to be voted on and a number of applications had been received. The preliminary work has been well done and the correspondence demonstrates that the success of the society is assured.

Report of Treasurer.

In the absence of the treasurer, J. A. Goodrich, who sent a letter of regret, his report was read by the secretary, showing that he had received $750, had paid out $250 and had a balance on hand of nearly $500.

Letters of Congratulation.

Letters of regret for their absence, wishing success to the society, and suggesting topics of interest were read by the secretary from Henry B. Prather, Buffalo, N. Y.; J. H. Kinealy, St. Louis; John Gormly, Philadelphia; James Mackay, Chicago; H. D. Crane, Cincinnati, Ohio; C. W. Light, Saginaw, Mich.; James R. Willett, D. M. Quay, Geo. D. Hoffman, Chicago, and John H. Petherick, Chattanooga, Tenn.

Board of Managers' Report.

In the absence of the chairman, Fred. P. Smith, a brief report was made by W. M. Mackay, who recounted the preliminary labors of the board for the meeting, and stated that a committee had been appointed to collect information, with a view to recommending legislation to provide proper laws to govern heating and ventilation.

The chairman of the council being absent no report was made.

Nominating Committee.

The president appointed a committee to nominate officers for the coming year, composed of Hugh J. Barron, James A. Harding, F. W. Foster, Albert A. Cryer and Henry Adams, with instructions to report at the next morning session.

The president then announced that the papers would be read, and in the absence of Prof. J. H. Kinealy of St. Louis the secretary read his paper on "Determining the Heating Power of Heating Systems," which is printed in full in another column.

J. J. Blackmore suggested that the premises of the paper were important, and in reference to steam met his views, but that the hot water standard was different from his experience. He urged that each member should endeavor, while the weather and season were propitious, to prove the value of the tables presented. In the absence of the writer of this paper it was laid over to be taken up at any time the members cared to call it up for further discussion. The next paper taken up was read by J. J. Wilson and was entitled, "A Short Talk On Hot Water Radiators." We reprint this in full elsewhere.

This paper was freely discussed by John A. Fish, James A. Harding, W. M. Mackay, Hugh Barron and Percival H Seward.

While it was yet under discussion a recess was called until 2.30 p.m.

TUESDAY AFTERNOON.

The president called the convention to order at 2.50 p.m., when telegrams were read from T. J. Waters, Chicago, and H. B. Prather, Buffalo, after which the members began the consideration of the topics for discussion. The secretary read the first topic: "In designing a system of heating and ventilation, shall we heat by radiation and supply only tempered air for ventilation, or shall we heat by air supplied for ventilation?"

C. S. Onderdonk favored simple systems

Stewart A. Jellett mentioned several plants using tempered air with advantage, but thought that combination systems were better. Mr. Jellett then read a paper prepared by him on "The Heating and Ventilating Engineer—A Commercial View," which is given in full elsewhere in this issue.

C. S. Onderdonk expressed himself as thoroughly in accord with this paper.

H. J. Barron asked how the evil could be cured, then stated that he doubted if it could be, and thought it would have to be endured.

Mr. Jellett stated that he had been asked by architects to furnish plans and specifications free of cost, who stated that they did not intend to pay. This had been met with refusal to work for nothing. Now his firm are superintending the construction of $400,000 worth of work, and their engineering department paid the best profits of their business and this branch of their business is growing. Major H. E. Light spoke earnestly on the advisability of plans being prepared by engineers of ability and suggested that contractors refuse to bid for large work when the plans were not prepared by engineers of known ability.

Chas. S. Hopkins expressed his opinion that this was a question of wages that would always be governed by the competition for the work.

J. J. Blackmore hoped that a preliminary step would be taken toward securing pay for engineers' services.

President Bates left the chair to speak on this topic. He held that service was just as much material to be paid for as the apparatus used. One point that had not been touched was the valuation put on the service by the engineer and it seemed that there was a fear that a charge for service would be opposed or the amount reduced. Fault could not be found with the owner if the engineer hesitated in his demand for a fee. If a plan was furnished that was clearly valuable and objection was made, no discouragement should be felt. He thought it probable that all could be benefited by more study of the art, then less difficulty would be experienced in collecting a fee for the service rendered. The evil, as it has been called, is susceptible of being cured, but is largely a work for individuals rather than collectively.

Another member stated that he believed that the stumbling block was largely the practice of boiler makers furnishing plans without limit.

The second topic for discussion was then taken up: "In a plenum system of heating and ventilation, which is the better for the air ducts, 'off and on' hot and tempered air dampers, or 'mixer' dampers?"

Major H. E. Light preferred the "off and on" system.

Charles S. Onderdonk stated his experience was against the "off and on" system.

J. J. Blackmore favored mixing damper.

The third topic was, on motion, deferred until after the reading of the paper by R. C. Carpenter. Topic No. 4 was then discussed: "The necessary size of risers for a given amount of heating surface for the different sizes of pipes and coils and for different classes and sizes of radiators."

H. J. Barron stated that the practice of making the return pipe one size smaller than the supply was common, but he could see no reason why it should not be one-half the diameter.

Stewart A. Jellett stated that good rules were known on this practice.

James A. Harding stated that W. J. Baldwin was present and he thought the members would be glad to hear from him. [Applause.]

Mr. Baldwin said he would hesitate to use a ¾ inch pipe to return from a 1½-inch pipe. As the pressure was reduced as the boiler became distant and friction increased, it was not best to reduce the return too much, and that the old rule was a good one.

At the request of some of the members, topic No. 6 was taken up: "The Probable Future of Electrical Heating."

Mr. Jellett hoped to learn something on this method of heating, as it was necessary that the society should know about this branch to be abreast of the times.

L. H. Hart then gave some information on this subject, but thought, owing to the cost, the heating engineer of today would have little call to prepare heating plants on this system. He sub-

mitted the following letter from W. S. Hadaway:

It is quite impossible to state in a few words the relation of electric heating to present methods, as the collateral advantages in every specific application are determining factors, as well as cost of the heat unit *per se*. In room heating on a large scale a close figure for use is that 1 electrical horse-power hour will heat (the heat being derived from electrical resistance solely) 7.5 square feet of common radiating surface 135° F. above room temperature. You can readily see how far 100,000 horse-power will go when used in this way. It is in combination with present low temperature methods of heat distribution that I look for the greater uses of electricity in heating. Of course in good practice 50 per cent. of the fuel energy is not too much to expect from steam heating on a large scale. We find in practice that few examples of high temperature heating show a fuel economy exceeding 50 per cent. But by combining the steam for low temperature distribution with electricity for the high temperature distribution, we can obtain figures high enough in fuel ecouomy to more than offset the increased fixed charges for plant, &c., and secure heat energy in a form readily localized, capable of close regulations and temperatures from maximum downward. I think this method can be illustrated by citing example of an apartment house. The house is equipped with boiler and electric plant for lighting. The rooms are warmed by steam and the water is heated by the same means. Electricity is used for lamps, arc or incandescent, ovens, broilers, fat fryers, sad irons, in short for every purpose excepting temperature, at which steam heat is usually applied. This means in practice two profits from the fuel. The electrical load described is obtained from live steam, and all the present live steam uses are replaced by exhaust. In other words, the electric plant is merely a high temperature factor, and its use leaves the energy of steam available for the present uses. It is needless to bring before you the advantages of such a system, as they are too apparent. The main feature to be brought out and emphasized is that the installation consists of two factors: First, a high temperature or heat potential system in which the electric plant is the means of generation and transmission, and a low temperature heat potential system, in which steam, either live or exhaust, is the means of generation and transmission, and in practice we cannot obtain the high potential system except from water powers and gas engines without the low potential system. I waut to extend the scope of the heating engineer to cover the electric plant. By so doing, a greater aggregate economy is secured and the conditions fulfilled add materially to the comfort and economy of this form of modern life. You can readily see that this is not flying into impossible schemes, but is a conservative view of heating problems. I have been greatly interested in the objects of your society, and as I expect to be in New York soon, I would be glad to attend your meetings. I think your people will find that the careful study of what I have outlined will aid materially in the work of heat distribution, even carrying it to the extent of district heat distribution for all purposes where heat is required, as we do water and gas and other forms of energy from central plants.

After the reading of this letter the convention adjourned.

WEDNESDAY MORNING.

The meeting having come to order at 10.30 a.m., President Bates stated he wished to correct a wrong impression that there had been a disposition to belittle the architects, which is wrong, for without the architect there would be no need of the engineer.

Letters were read by the secretary from R. C. Carpenter, W. F. Wolf and John Demarest regretting their inability to be present.

The report of the Nominating Committee was presented by James A. Harding, and after a brief discussion it was decided to hold the election at 12 o'clock.

Alfred A. Hunting of Boston read a paper entitled "Heating and Drying by the Use of Exhaust Steam and Live Steam Reduced to Low Pressure, Either Separately or in Combination." Chas. S. Onderdonk suggested that as this paper presented facts it gave little opportunity for discussion, but cited several proofs that failure to utilize exhaust steam was an expensive waste.

In the absence of Professor Carpenter his paper was read by Mr. Harding. It was entitled "Testing Steam Radiators."

Mr. Barron stated that his ideas differed with those of the paper and that he was in no doubt that some of his cherished views were wrong, but that the profession would probably pursue the old course, though the tests described showed such practice to be different from what would be best. Mr. Jellett remarked at some length on the efficiency of what are known as flue radiators, agreeing that the heating of air by contact was the most efficient means and radiators constructed to accomplish a close contact of the air were to be desired. J. J. Blackmore and J. A. Harding also made remarks on this paper.

Further discussion was deferred, as the time set for the election had arrived and the president announced A. G. Paul and D. M. Quay as tellers.

Mr. Bates stated circumstances existed that would prevent him from serving further as president and he hoped the members would cast their ballots for Chas. W. Newton.

The election resulted as follows:

President, Chas. W. Newton.

First vice-president, W. M. Mackay.

Second vice-president, Chas. S. Onderdonk.

Third vice-president, Stewart A. Jellett.

Secretary, L. H. Hart.

Treasurer, J. A. Goodrich.

Board of Managers: James A. Harding, B. F. Slangland, Geo. B. Cobb, U. G. Scollay and Wm. McMannis.

Council: R. C. Carpenter, E. P. Bates, Henry Adams, T. J. Water, A. A. Cryer.

An amendment to the constitution was offered by Mr. Jellett that hereafter the elections be held according to the plan followed by the American Society of Mechanical Engineers. After an invitation had been given by Mr. McMannis to visit the Department of Buildings and inspect the New York school heating system the meeting adjourned till 3 p.m.

WEDNESDAY AFTERNOON.

The meeting was called to order by Vice-President W. M. Mackay at 3.20 p. m.

D. M. Quay then spoke on the paper of Professor Carpenter, stating that specifications should go further than to give the amount of radiation required and the hight, shape and character should be specified. J. J. Wilson asked for the results of experience on the velocity with flue radiators, as compared with ordinary radiators. Mr. Jellett stated he had found that above 25 inches in hight flue radiators gained little, but up to this hight a velocity of two to two and one-half times what was possible with ordinary radiators could be secured. He had secured a temperature of 180° in the air current above the radiator and a temperature of 203° in the flue, which was not possible with a direct radiator.

In the absence of T. J. Waters the secretary read his paper, entitled "Heating and Ventilation of School Buildings," and B. F. Stangland read the paper by H. B. Prather, entitled "A Prison Heating and Ventilating Plant." Mr. Jellett described the prison at Allegheny, Pa., as having been erected previous to the prison mentioned in the paper. This plant has been very successful in operation, and in use since 1883 without repairs.

H. J. Barron then read his paper on "The Literature of Heating and Ventilating," after which he read a criticism on his paper by David M. Nesbit of London, Eng.

Discussion was resumed on the paper entitled "Determining the Heating Power of Heating Systems."

D. M. Quay remarked that while the specifications generally written required some result, that result was not sufficiently definite in its description to avoid difficulty in securing prompt settlement.

Mr. Jellett mentioned Schumann's rule for calculating the requirements of buildings for determining the final result, as being a good guide though not entirely satisfactory.

Fred. P. Smith remarked that it might seem odd for an engineer to mention that at times the heat unit is too closely adhered to, and that formula was not to be depended on at the expense of practical experience.

Mr. Barron doubted if the architect or his client could be satisfied in August by a test that the plant would be adequate in cold weather. Mr. Harding mentioned that he had one customer to agree to pay 6 per cent. interest on the cost of the plant till satisfied of its efficiency. W. J. Baldwin cited an experience where less indirect surface was required for a building than was needed in direct surface. Mr. Quay mentioned that respect must be paid to the data prepared by experts, even though cases were found where special judgment was necessary. Mr. Baldwin stated that data must be looked on as a beginning, which is necessary practice.

Mr. Smith suggested that the society should appoint a committee to secure a set of guarantees for both heating and ventilation to be authorized by the society.

Mr. Harding made a motion that a committee of three be appointed to confer with a committee from the Master Steam and Hot Water Fitters' Association on the formulation of a uniform specification and contract for the heating of buildings, which was carried. The committee appointed was Stewart A. Jellett, D. M. Quay and F. P. Smith.

James A. Harding mentioned that the by-laws provided for a semi-annual meeting at some place to be designated.

The American Society of Mechanical Engineers extended an invitation to the members to attend their monthly meeting on Wednesday evening, the occasion being the reading of a paper by Alphonse Fteley, chief engineer of the Water Works of New York, on "The Water Supply of New York."

The society tendered a vote of thanks for the invitation and then adjourned to meet at 10 a. m. Thursday morning.

THURSDAY MORNING.

The convention was called to order at 10.30 a.m. by Vice-President Mackay. Mr. Barron opened a discussion of the paper on "Heating and Ventilating of School Buildings," taking exception to many of its provisions, the location and character of the radiators, the speed of the air and the exhaust fan as used. B. Harold Carpenter agreed with the paper in the use of the blower. He did not think revolving air over night bad practice, even in the coal region where the fuel used could be secured at 90 cents per ton. Revolving the air over night could have few objections with a system that could change the air in the building in ten minutes. During the night vents were closed and the air was revolved by gravity from contact with direct radiators. The closets were provided with a vent shaft having a heater in it and no air direct from the system was used. The air from the halls and corridors, owing to pressure, found its way to the closets, kept the room warm and passed off through the vent shaft, preventing the closet air entering the building.

Mr. Harding spoke on the use of the exhaust fan in directing the outgoing air to the proper exit.

Mr. Jellett stated that he overcame vibrations from fans by drawing the air through fans and making connections by means of painted canvas. Air coming through the fan never brings water to freeze on the fan and stop its operation as he had known. He used an aspirating coil in the assembly chamber of the ventilating ducts in the attic, as he had known the weight of the air in a cold attic to stop ventilation. He did not depend on louvers for the escape of air, as they were affected by wind pressure, but used specially constructed ventilators which prevented down draft. He also mentioned the use of mica dampers in connection with louvers and vent shafts to prevent down currents.

Mr. Baldwin called attention to the unavoidable placing of ventilating flues in outside walls.

The secretary stated that Thomas McNeill, an old steam engineer, was present and had invited the members to attend one of his lectures at the New York Trade School on Friday afternoon.

Mr. Baldwin, who designed the system of ventilating the subways of New York, gave a brief description of it, and invited the members to inspect the system.

Mr. Jellett asked to have the Specification Committee increased to five, and the Chair appointed James A. Harding and E. P. Bates.

George B. Cobb moved that a vote of thanks be tendered to their past officers for their labors in perfecting its formation, which was carried.

After some discussion, a motion dispensing with the semi-annual meeting for 1895 was then carried.

The secretary read the contract with the American Society of Mechanical Engineers for the use of their house, which was considered very generous.

Topic No. 7 was taken up and Mr. Jellett described a method of avoiding the use of air valves, and mentioned systems with 428 radiators and others of 44,000 feet of radiation working successfully.

J. L. Wells considered that the air valve could be dispensed with only at some risk.

Mr. Quay described successful working plants in Chicago.

The meeting then adjourned.

THURSDAY AFTERNOON.

The convention was called to order by Vice-President Mackay at 3 p.m. The secretary read a telegram from Charles W. Newton resigning the office of president, making necessary a new election, which resulted in the choice of Stewart A. Jellett for president. Mr. Jellett expressed his interest in the society, and said his endeavors should be for the welfare of the society, of engineering and the public. The advance of Mr. Jellett left vacant the office of third vice-president, which was filled by the election of D. M. Quay.

Mr. Harding moved in compliance with the law that the secretary be instructed to cast a ballot for all of the officers of the society, which was done.

New Members.

The council announced the election of W. Harry Dewey and Norman S. Kellogg to full membership; Geo. T. Weymouth, Jr., as a junior member, and Samuel D. Tompkins, Thomas Thompson and A. G. Paul as associate members.

Topic No. 12 on "Value of Standing Committee of the Society on Tests and Standards" being next discussed, D. M. Quay moved that a committee be appointed to make and supervise tests and standards, which was carried, and the following committee was appointed: Major H. E. Light, A. A. Hunting and E. P. Bates.

H. J. Barron moved that a committee be appointed to establish a clearly defined minimum standard of heating and ventilation for all classes of buildings, which was carried, and the following committee was appointed: H. J. Barron, Wm. McMannis and Prof. J. H. Kinealy.

On Mr. Barron's motion that a committee of five be appointed to frame a law to provide legislation compelling the ventilation of all public buildings in accordance with the standard of this society the chair selected the following: W. M. Mackay, James A. Harding, L. H. Prentice, H. D. Crane and B. Harold Carpenter.

Discussion of A. A. Hunting's paper on "Heating by Live and Exhaust Steam" was taken up and remarks made by Messrs. Barron, Quay and Harding.

J. L. Wells, chairman of the Executive Committee of the Master Steam and Hot Water Fitters' Association of the United States, spoke on the preparation of a uniform contract, and stated that one had been drawn up which would be sent to all members if they desired. This contract is not considered to be final in form, but open to improvement with a view to provide for a reasonable safety to the heating contractor for his money. It also provides for the payment for plans and specifications and makes provision for insurance and the payment for extra work.

Topical discussion on iron and steel pipe being taken up, D. M. Quay stated that steel pipe as found was often harder on one side, making it difficult to cut, and also to thread, as the threads were deeper on one side than on the other. Steel pipe was also thinner, so that the threading weakens it more relatively. He also stated that pipe up to 2-inch is now made with a butt weld. Mr. Light found it difficult to make up the joints in steel pipe. Mr. Barron said his men objected to using steel pipe. Above 6 inches in size, however, steel pipe is not objectionable, but in small sizes it had been said it increased the labor of cutting and threading 20 per cent. Mr. Carpenter asked for information in reference to durability of these pipes exposed to electrical currents. Mr. Barron related the experience of a contractor who used cast iron pipe with screw joints in the ground with good results.

In discussing topic No. 20 the general impression was that mushroom registers introduced air at the point of contamination and then circulated it, which was objectionable.

The convention adjourned at 7 p.m., to meet again next year in New York at the call of the Board of Managers.

A. B. Wheeler, formerly with the Detroit Heating & Lighting Company,

and Windsor Heater Company, is now with the Hoffman Russell Company, 82 Lake street, Chicago.

HEATING NOTES.

THE NIAGARA RADIATOR COMPANY, Buffalo, N. Y., have placed Walter Pendleton in charge of their New York office, at 89 Centre street. Mr. Pendleton has an attractive display of radiators in his showroom.

W. A. RUSSELL has resigned the management of the business of the Niagara Radiator Company, at 89 Centre street, New York, in order to give his whole attention to the valves and numerous specialties of the Detroit Lubricator Company, Detroit, which under his management have become well known to the heating trades. Mr. Russell is now furnishing an office very handsomely in the same building and will be pleased to receive calls from those in the heating trades.

A MEETING of the stockholders of the Kentucky Heating Company was held last week at Louisville, Ky., and resulted in the re-election of the old Board of Directors and officers. Donald McDonald was elected president, R. T. Durrett vice-president, Chas. F. Johnson second vice-president, W. T. Durrett engineer, and Thomas W. Kennedy secretary. The members of the Board of Directors are R. T. Durrett, J. H. Lindenberger, P. Meguiar, Charles F. Johnson. W. H. Dillingham, Nicholas Finzer, J. G. McCullough, W. T. Durrett and Donald McDonald.

G. SHREWSBURY of the Calda Works, Station Road, Camberwell, London, S. E., England, is putting on the market a new conservatory boiler to use gas as a fuel.

THE LARGE CALENDAR which the Smith & Winchester Company of Boston, Mass., are sending to their friends in the trade is a conspicuous record of the days. The whole publication measures some 14 x 25 inches and half of that space is given up to the 12 monthly sheets. The design of the upper card includes a picture of the Winchester boiler, and besides the name of the firm, calls attention to their business in steam, gas, water and plumbers' supplies. The word "Everything" spelled out in pipe fittings indicates the range of the company's goods. Special articles are noted on each separate sheet. Pumps, wind engines, heating boilers, &c., are some of the articles enumerated.

THE C. R. MERES MANUFACTURING COMPANY of Norwalk, Ohio, have been incorporated, with a capital stock of of $10,000. The incorporators are Calvin Whitney, S. W. Owen, C. P. Wickham, J. S White and F. H. Jones. The company will manufacture the hot water furnace recently patented by C. R. Meres.

THE JOHN DAVIS COMPANY, 253 255 Kinzie street, Chicago, are to install a steam heating and power plant in the building of George G. Newberry, Wabash avenue and Eldredge court.

THE SAMUEL I. POPE COMPANY, 237 Fifth avenue, Chicago, are to furnish for the water works at Woodstock, Ill., engine house and stack, tubular boiler, artesian well, pump, fire pump, boiler pump and heaters and four miles of water pipes. The amount of contract is $26,000.

Determining Heating Power of Heating Systems.*

BY J. H. KINEALY, ST. LOUIS, MO.

It has always seemed to me that the requirement in a contract for a heating system that makes the contractor wait for his money until the system can be tested in zero weather, in order to determine its heating power, is a bad one in every way.

If the plans and specifications have been drawn up by a consulting engineer not in the employment of the contractor, the engineer is responsible for the proper working of the system, and the contractor, in such a case, is only responsible for the work being done in accordance with the plans and specifications.

Where there are no plans and specifications upon which contractors are asked to bid, but each contractor is expected, or asked, to furnish his own plans from which to work, it is but reasonable that the owner should be given either a complete set of plans and specifications that he may submit to a consulting engineer for advice, or a guarantee of some kind as to the heating power of the plant.

Very few of the small heating systems put in dwellings have any very elaborate plans drawn for them, and many large plants are put in without any specifications at all. This of course is the natural result of the desire on the part of the owner to avoid the cost of plans and specifications. He, therefore, goes to a firm of contracting heating engineers and tells them he wants his building heated by steam or hot water, as the case may be. The contractors send a man to look at the building or the plans of the building, and to make a rough sketch of what will be required; this sketch may or may not be somewhat elaborated in the office, but, whether it is or not, it will serve as the basis of the bid for doing the work. The contractor knows the owner does not care for any elaborate plans and specifications, and, therefore, as he should from a business point of view, he spends as little money upon them as possible, and makes only such drawings as are absolutely necessary to carry out the work. Another reason why the contractor does not get up more elaborate drawings than are absolutely necessary for himself is that he is not sure the owner will want the work done after the bid is made. It may be the owner finds he cannot afford to have the work done at all, or that he has received a cheaper bid from some other firm.

The owner desires only that the building shall be heated during all kinds of weather, and that the cost of the plant shall be as small as possible; and as custom in most parts of the country has decided that a heating system of a building shall be considered as adequate if it will keep the temperature of the air in the building at 70° F. during zero weather, he asks the contractor to guarantee the plant to do this.

The contractor guarantees that the plant he proposes to put in the building will keep the temperature inside at 70° F. when it is zero degrees F. outside; puts in the plant, and then, hardest part of all, waits until zero weather to test the plant and get his money.

In order to avoid the waiting for zero weather on the part of the contractor, I desire to propose a scheme for determining the heating power of heating systems during weather when the temperature is above zero.

It is assumed, as the basis of the scheme, that the heat lost through the walls and windows of a building during an hour is directly proportional to the difference between the temperature of the air inside the building and that of the air outside; also, that the heat given to the building in an hour is directly proportional to the difference between the temperature of steam or hot water in the radiators and that of the air inside the building.

The total amount of heat lost by the building per hour is given by the equation

$$H_1 = a\,(t_1 - t_2).$$

a is the total heat lost per hour per degree difference in temperature.

t_1 is the temperature of the air inside of the building.

t_2 is the temperature of the air outside of the building.

Also, the total amount of heat received by the building per hour is obtained from the equation

$$H_2 = b\,(t_3 - t_1).$$

b is the total heat received per hour per degree difference of temperature.

t_3 is the temperature of the steam or hot water in the radiators.

t_1 is, as before, the temperature of the air inside of the building.

t_3 may be very little greater than the temperature of the steam in the boiler, or it may be much greater, depending upon the length of the pipes, and upon the way in which they are protected.

Now, after the system is in the building, it is evident that the heat lost per hour must be equal to what is received, if the temperature inside remains constant, and, therefore,

$$H_1 = H_2, \text{ or}$$
$$a\,(t_1 - t_2) = b\,(t_3 - t_1).$$

From this we have,

$$\frac{t_3 - t_1}{t_1 - t_2} = \frac{a}{b}$$

Since the building cannot change, a cannot change; and since the heating system is supposed to be always the same after it is put into a building, b cannot change. Therefore, for the same heating system in a building, we have this proposition, which always holds good whatever may be the value of t_1, t_2, or t_3:

The result obtained by dividing the difference between the temperature of the steam or hot water in the radiators and the temperature of the air inside the building, by the difference of temperatures of the inside and outside air, always the same quantity for the same building and heating system.

While this proposition is not exactly true, it is true enough for all practical purposes, and may be taken as true without any great error. It is evident, also, that the proposition refers only to "direct" systems of heating and not to indirect systems.

Now, let us assume that our standard temperature for inside air is 70°; that our standard temperature for outside air zero degrees; and that the temperature of the steam or hot water in the radiators shall be t_4, when the inside air is 70° and the outside air is zero degrees. Then, from the proposition just given, we have

$$\frac{t_3 - t_1}{t_1 - t_2} = \frac{a}{b} = \frac{t_4 - 70}{70}$$

From this equation we get,

$$t_3 = \frac{t_1 \times t_4}{70} - \frac{t_4(t_4 - 70)}{70}$$

* Presented at the New York meeting of the American Society of Heating and Ventilating Engineers, January 22-25, 1895.

In this equation, it must be remembered, t_4 is the guaranteed temperature of the steam or hot water when the temperature of the inside air is 70° and that of the outside air is zero degrees; t_1 the temperature of the inside air, when the outside air is t_2 and the temperature of the steam or hot water is t_3.

To show the use of the equation assume the following example:

A contractor agrees to put in a heating system that, with 5 pounds of steam by the gauge, will keep the inside air at 70° when the outside air is zero degrees. He makes a test of the heating power of the system when the outside air is at 10°, and with a gauge pressure of 3 pounds of steam keeps the temperature of the air inside at 75°.

Here we will assume that the temperature of steam in the radiators is that corresponding to the pressure in the boiler; then t_4 is 227, the temperature corresponding to a gauge pressure of 5 pounds, t_1 is 75 and t_2 is 10. Putting these values in the equation for t_3 we get:

$$t_3 = \frac{75 \times 227}{70} - \frac{10\ (227 - 70)}{70} = 222.5$$

The gauge pressure corresponding to 222 5° is about 3½ pounds, so that, as the building was heated during the test with a gauge pressure of 3 pounds, the system would seem to have a slightly greater heating power than called for by the contract.

In the case of open hot water systems of heating the test may be run with the outside air at almost any temperature, as the hot water in the heating system may have any desired temperature less than 212°, and not run the temperature of the inside air above 70°, while in the case of low pressure steam systems the test cannot be made when the outside air is much over 10° without running the inside temperature up to 80° or 90° during the test.

I have assumed that when the temperature of the outside air is zero degrees and that of the inside air is 70°, the temperature of the water in the radiators will not average more than 200°, the temperature of the hot water entering will be 210° and that of cold water leaving the radiator will be 190°, and have calculated the following table showing what the average temperature of the water in the radiators ought to be. in order to keep the inside air at 70° for different temperatures of the outside air.

Table I.

Temperature of outside air.	Average temperature of water in radiators.	Temperature of water entering the radiators for a fall of 20°.
0	200	210
5	191	201
10	182	192
15	172	182
20	163	173
25	153	163
30	144	154
35	135	145
40	126	136

A custom of reducing the heating power of systems to a common standard would be somewhat similar to the custom that now prevails among mechanical engineers of reducing the evaporative power of boilers to a common basis. Tests to determine the evaporative capacities of boilers are made under widely different conditions of gauge pressure and temperature of feed water, but all water evaporated is reduced to "water from and at 212°." I propose, therefore, that in determining the heating power of heating systems tests be made and the results of all tests be reduced to standard conditions.

The standard condition for hot water systems shall be: An average temperature of 200° in the radiators to keep the inside air at 70° when the outside air is at zero degrees.

The standard condition for low pressure steam shall be: A pressure of 5 pounds. by the gauge, in the boiler to keep the inside air at 70° when the outside air is at zero degree.

If tests were made to determine the heating power of direct radiator heating systems, and were reduced to the proposed standard conditions, the profession would soon acquire a lot of valuable data as to the required ratio of heating surface to cooling surface for various conditions of exposure and various classes of building. I can see no valid reason why such tests should not not be made upon heating systems, and their heating powers reduced to the manner proposed. Such a method of determining the heating power of plants would undoubtedly be of value to the contracting heating engineer, as he would not then be obliged to wait for zero weather in order to determine whether or not the heating power of a plant was as guaranteed.

Below is given a table showing the gauge pressure required to heat the air inside of a building to different temperatures for various temperatures of outside air, and the heating power be equivalent to that required to heat the same building to 70° in zero weather with steam at 5 pounds by the gauge:

Table II.

Temperature of outside air.	Gauge pressure of steam in the boiler for inside air at a temperature of			
	70°	75°	80°	85°
	Pounds.	Pounds.	Pounds.	Pounds.
0.....	5	11½	20½	....
5.....	1	7	14	....
10.....	....	2¾	9	16¾
15.....	....	.....	4½	11
20 ...	... .	.....	½	6¼
25.....	....	.....	.....	2¾

A Short Talk on the Construction of Hot Water Radiators.*

BY J. J. WILSON, TROY, N. Y.

My only apology for inflicting this communication upon you is a desire to offer for your consideration a few suggestions of importance relating to the construction of radiators for hot water heating. It has been an idea with many engaged in the heating line that it is necessary to purchase a high priced radiator in order to have it prove satisfactory. This, however, has not been my experience. The shape of numerous high priced radiators is such that, while suitable for steam, they do not represent the best type of radiator for hot water heating. It is a well-known fact among the trade that, owing to the phenomenal increase in this system of heating, many radiators formerly used for steam heating were put upon the market for water without any changes, and in cases where they lacked top connections between the sections they were added, very little thought or attention being given to their internal capacities or outward shapes, and there is no doubt that it has been a detriment, in some instances, to the success of this system of heating, requiring much more fuel to heat certain styles of radiators, owing to their large internal capacities for holding water, and entailing extra work upon the boiler to heat a certain number of square feet of radiation.

I will admit that there is a necessary volume to the body of water as it passes through the radiator sections which it would not be well to reduce. This volume, however, has not as yet been definitely established. To more clearly illustrate my meaning, I shall make a comparison: A bath or range boiler 16 inches in diameter and 48 inches in length will contain 9651 cubic inches, or a water capacity of about 42 gallons. The surfaces of the boiler amount to about 19½ square feet, and if the boiler surface were not galvanized, and its location such that air could pass freely over its surface, it would heat a room 6 x 9 x 10 feet, or 540 cubic feet of space, having average wall and glass exposure, to a temperature of 70° in zero weather, with the water at from 160° to 170°.

I offer, in contrast to the above, a radiator the actual size of its water section, independent of feet, being 33 inches high, 9 inches wide, and 1¼ inches thick, its internal capacity averaging a pint of water to the square foot of heating surface, and the actual surface of section backed by water being about 6 square feet. Using the volume of water in the range boiler and distributing it among the sections of the radiator it would furnish water for 336 square feet of heating surface, sufficient to heat a schoolroom 36 x 28 x 12 feet with average glass and wall exposure, but with only one change of air per hour, to 70° in zero weather, the temperature of the water being from 160° to 170°. There are radiators which may, in a measure, be likened to the range boiler, containing the maximum amount of water in their internal surfaces to the minimum square feet of heating surface.

During the past year I examined a hot water plant which had been in use two winters, but failed to give the guaranteed results, viz., a temperature of 70° in zero weather with the water at 170°. The boiler construction was favorable to a quick circulation, and under ordinary circumstances equal to heat the amount of surface attached to it. I examined the piping valves, fittings, &c., to discover anything which would be detrimental to the water circulation, but found them correct. The radiators were then measured and found to contain the necessary amount of surface to heat the required space. Upon making a rough measurement of the internal surface of these radiators, it was discovered that they would average nearly a quart of water to the square foot of heating surface. Here it was very evident that the boiler had double work to perform, or twice the amount of water to heat per square foot of heating surface over the radiator which would average a pint of water to a square foot of surface. I suggested the use of another radiator, but I have since understood that the plant was removed without this trial being made, which I feel assured would have corrected the trouble. This is a most important factor in the successful working of a hot water boiler, viz., the amount of water to be heated per square foot of heating surface in radiators. Another important matter connected with the

* Presented at the New York meeting of the American Society of Heating and Ventilating Engineers, January 22-25, 1895.

construction of radiators which seems to be entirely overlooked by the trade is the grade or class of iron used in their manufacture. I have a customer who, after installing a heating plant, was compelled to remove the radiators used and substitute others in their place. This party is an experienced heating engineer, and had many heating plants in the same vicinity in which heating surfaces were apportioned the same, the conditions of exposure being equal and the results satisfactory. The unsatisfactory plant had been erected in the early summer, and during the first cool days of autumn its deficiencies were not noticed, but when the cold days of winter appeared a marked absence of heat could be felt. The boiler was large enough for the work to be performed. The system of piping was examined for mistakes and trappings; none were found to exist. It apparently was a problem that could not be solved. The idea then occurred that the radiators might be responsible for the results. The internal openings were examined for imperfect construction, resulting from dropping of cores, &c , in the sections, but the circulation was found perfect. Finally he wrote the maker of the radiators, who at once claimed they were all right, and offered to take them back if he could definitely establish the fact that the radiators were responsible for the conditions existing. A radiator of another make was procured, which was of sufficient size to heat a selected room, connected up to the system, and found to thoroughly heat this particular room. The balance of the radiators were removed and others substituted in their place with the result of the entire building being well heated and entirely satisfactory. The radiators which were removed were of a class which had usually given good results. They were shipped back to the factory and in transit a section was broken, the fracture revealing the fact that the iron was exceedingly hard and brittle, its structure being very close grained and of a silver color, indicating the presence of sulphur in the iron, possibly caused by sulphur in the coke used in the cupola for melting the iron. The internal passages in the sections of the radiators were very rough and had an appearance of slag, supposably caused by the use of a large amount of scrap iron in the casting mixture. This shows the vast importance of using a good quality of iron, one which has the maximum of porosity with high tensile strength.

The competition in the sale of radiators is the cause, no doubt, in some cases, of the use of inferior grades of iron in their construction, and while the effect may not be so pronounced as above mentioned, it is undoubtedly an obstruction to the free passage of the heat units emanating from the element used for heating the radiators. My experience has been that a radiator, rectangular in shape, with flat surfaces, and containing about a pint of water to the square foot of heating surface, will give good satisfaction for water heating, other details of construction having proper attention, such as the proper spacing of sections, permitting a free circulation of air over their surfaces, the connections between the sections being free from any projections which may impede free circulation of water. Ornamentation which increases the thickness of the iron in the sections is detrimental. Surfaces in direct radiation not backed by water should not be rated as effective surface, and where possible the preference for decorating radiators should be by metallic bronzes, their conductivity being much higher than enamels. A preference should also be given to radiators whose connections between sections are such as to permit the fitter to connect and disconnect them, allowing the assembling of radiation into required sizes from stock on hand, which is a decided advantage during the season when radiator factories are pushed to their utmost to fill orders. A failure to ship radiators promptly often causes vexatious and expensive delays. I hope our society in the near future may be in a position to obtain, by experiment and research, positive data on the details above mentioned appertaining to the construction of radiators for hot water heating.

The Heating and Ventilating Engineer — A Commercial View.*

BY STEWART A. JELLETT, PHILADELPHIA.

I was much interested in a recent editorial in an English paper, on the subject of "Professional Fortunes," which the writer opened by advising all young men starting out to make their fortunes "to avoid the service of the State and all the professions alike." He then contrasted the fortunes made in trade with those of high and able offices of the Crown, and the leading members in the profession of the church, medicine, law and engineering.

The article is written from an English point of view, but it applies with equal force to us. Few, if any, of the great American fortunes have been made by professional men, and I have no knowledge of any among those engaged in our branch of engineering. Possibly I underrate the wealth of my fellow members.

The tendency in trade over the civilized world to-day seems to be downward. In some foreign countries it has apparently reached a starvation basis, from which there is as yet no prospect of relief. In America I regret to see the same tendency, in the increased numbers of the unemployed in our large cities, due in a great measure to unrestricted immigration, and the gradual reductions made in the price of goods, and, it follows, in the cost of producing them.

The maximum of quality or results for the minimum of cost is the demand of the buyer, and the manufacturer is striving to meet the conditions by improved machinery, systematized processes, and reduced wages and profits. The merchant is meeting the problem better by the enormous growth in the scale of everything in which business can be done. The world is his market and the printing press his salesman.

Changes in the methods of doing business enable him to carry his trade mainly on credit. I question if, in any legitimate business to-day, the margin of profit is as great as 20 years back, but where the enterprising merchant of that time had 100 customers his successor of to-day has 1000. It is the magnitude and multiplications possible in trade, and the rapid receipt and delivery of goods, enabling four to five times the volume of business to be done on a given capital, that accounts for present day mercantile fortunes.

This advantage in scale is entirely wanting to the professional man, as his business requires him (at least to a great extent) to come in personal contact with his customers, and there are but ten hours in a hard worked day. If he be a doctor he must listen to the plaints of his patients, if a lawyer to the woes of his client, or if an engineer to the needs of his customer or the troubles of his contractors, all of which involve time. If these matters are delegated to assistants entirely he loses custom, and with custom income. It is unfair that this condition of things should exist. The engineer who has devoted years of careful study and thought to perfecting himself in his profession should be, and is, in all fairness, entitled to the same returns with his brother merchant of equal ability. It is true, however, that the phrase "For professional service rendered" on a bill has to many men a different sound from that of "To merchandise furnished"

It is with the thought of improving the commercial position of the heating and ventilating engineer that I submit this sketch for your consideration, trusting that it will open a discussion that will point the way to improvement. "We cannot make headway as individuals; we can only make headway by acting as a body."

And it is by correcting the existing abuses that I believe we can make most headway at present. The broad motto of the business world is the "Maximum of business at the minimum of expense." Let us apply this to our branch of trade, thoughtfully considering the many unbusinesslike methods that have been allowed to take root and grow. Should it not in our case be reversed, the maximum of expense for the minimum of business? I think so, and believe that you will agree with me when you consider the matter in detail.

The adage, "Competition is the life of trade," is capable of misinterpretation. Competition can overreach itself and become the death of trade, and unregulated competition is to-day the bane of many branches of engineering, and particularly our own. I quote from the Bulletin of the National Association of Builders: "While we are all competitors, and sometimes sharp competitors, we should still stand firmly together for the correction of errors in practice and in principles of action."

The business of heating and ventilating as carried on to-day is capable of three divisions:

1. The engineer who plans and supervises only.
2. The engineer who contracts only.
3. The engineer who does both.

The first is dependent wholly for his income from fees received for services, and he is consequently affected by the business methods of the third, who plans as well as contracts. The second looks solely to the profits of his contracts for his remuneration, while the business of the third, if rightly conducted, should pay a profit in each division. Let us now consider the abuses that most need correction. I would place first of all the practice of making plans and specifications for architects and owners free of expense to them. The committee who drew our constitution were impressed with the necessity of correcting this (see article 1, subdivision 8), "to establish a uniform scale of prices for all professional services."

The scale is nearly uniform now, I regret to say, but, like the winds of heaven, uniformly free to all. I have heard contracting engineers say that this custom has obtained such a firm

* Presented at the New York meeting of the American Society of Heating and Ventilating Engineers, January 22-25, 1895.

hold that to refuse to render such services free would kill their contracting business. You can all readily see the effect of such an unbusiness like practice. It largely kills the business of the consulting engineer, and takes a large part of the legitimate profits made in contract work to meet the expense of making these plans and specifications.

Many of our architects have one or two concerns to whom they send their building plans regularly to have the heating and ventilating and power systems carefully worked out, but with no thought of paying for such services. There is no sound reason why this abuse should not be at once corrected, and there are good reasons why it should be.

1. It is unfair to the consulting engineer, who manifestly cannot render such services free.

2. It is unjust to the general customers of the contracting engineer who does it, as the expense of doing it must come from the work done for them, and for which they are paying.

3. It places the architect who accepts such gratuitous services in a position to be justly criticised, as he must either be unfair to the engineer from whom he accepts such service, for which he himself is being paid, or he must be unjust to his client if the acceptance of such service affects his judgment in deciding the award of contracts for the work.

4. It is not business, viewed from any standpoint, and is unjustifiable. Let us, therefore, not adjourn this our first annual meeting until we have taken the necessary steps for an immediate and radical change in this department.

The present forms of specifications we are asked to bid on, and the contracts presented for our signatures, are also a proper subject for your just criticism. There are many specifications handed us for estimates which do not describe in any complete manner the work to be done, but this slight oversight is taken care of, so far as the owner is concerned, by some such clause as this: "The material and workmanship throughout must be entirely satisfactory to the owner and the architect, and the system must be guaranteed in every respect to do the work asked for to their satisfaction." I would advise all our members not to sign a contract with the word "satisfactory" in it. I hold that what cannot be defined or accurately stated should be left out of the specifications.

Who can estimate what it will cost to do anything to another man's satisfaction, one whom possibly he does not know? It came into use in the days when heating was largely a matter of faith in the party employed to do the work, and when there was no general or definite knowledge of the subject. It is the outgrowth of methods that do not exist to-day, and its use should be dropped. The buyer should be required to decide whether the thing he is asking you to do, when done as specified, will be satisfactory to him or not.

Another relic of the days of faith in the heating business is the clause requiring a guarantee of temperature. You have doubtless all read the interesting correspondence on this subject in an engineering journal published in New York in answer to a letter written them by one of my partners. It will not, therefore, be necessary to enlarge on this subject. But why, I would ask, should a contractor when asked to bid on a definite amount of heating surface and boiler, located exactly on a plan, sizes of pipes, &c., being given, and the character, exposure and use of the building, better known to the maker of these specifications than to himself, be asked to guarantee the result? The contractor is asked to insure the results of another's calculations, for which insurance he collects no premium and for the practical determination of which guarantee he is often dependent on the employees of the owner. There is certainly no equity in this requirement, and the margins of profit on the labor and materials entering into the work do not justify the risk.

Our society should also protest strongly against the use of the inferior material that is now crowding the market, and insist that the standard be raised, advising the use of such materials only as they can conscientiously recommend.

There are, no doubt, numerous other abuses, some local, others general, that need correction, and that will be adjusted as we grow to appreciate more the benefits of our society. Those I have pointed out seem to me to first need attention. I will close by quoting from the Bulletin of the National Association of Builders, which is as applicable to our business as to that of the builder:

"The present custom of interpreting drawing and specifications is inherently unfair, notwithstanding the fact that many buildings are annually erected without serious difference between the contractor and architect; the contractor is allowed no voice in the settlement of questions that are of vital pecuniary interest to him. Contractors have always submitted to a large amount of injustice in the demands made upon them, but there is no good reason why they should continue to do so."

Polluted Well Water.

From an interesting article on the "Well Waters of Our Farm Homesteads," read at the Montreal meeting of the American Public Health Association by Frank T. Shutt, Chief Chemist of the Dominion Experimental Farms, Ottawa, Canada, we quote the following remarks on testing water:

I feel that I should, in closing this paper, make a brief reference to the efficiency of the so-called tests in diagnosing a water. I am aware that many are of the opinion that reliance may be placed on the results of a qualitative examination by means of the sugar test—nitrate of silver and permanganate of potash—used alone or in conjunction. My experience leads me to believe that such results are frequently misleading. The amount of precipitate by nitrate of silver when the reagent is used qualitatively can only be conjectured, and from it no correct inference can be drawn unless something is known of the strata of the district and the amount of free ammonia that accompanies it. The decolorization of permanganate of potash is still more fallacious. Peaty and upland waters will discharge the color from a comparatively large quantity of permanganate of potash, while we often find very little of this salt required by water reeking with the decomposing products of excreta. The color and appearance of a water cannot be relied upon as indicating the purity or impurity of a sample. Many waters that have no marked odor prove on examination to be seriously contaminated. A water may be colorless, bright and sparkling, and yet dangerously polluted, while on the other hand, dissolved peaty matter of a comparatively harmless nature may tinge a water with a suspicious yellow color. There are, I believe, but few cases (and those of very bad and very good waters) where complete analysis is not necessary to a correct diagnosis. In our laboratory we always determine the following chemical data: free ammonia, albuminoid ammonia, nitrogen in nitrates and nitrites, chlorine, total solids at 105° C., oxygen absorbed at 80° F. from permanganate of potash in 15 minutes and in 4 hours, and phosphoric acid (qualitative). The results are returned in parts per million.

Some Wonderful French Schemes.

Plans and proposals for the projects of the International Exhibition at Paris in 1900 are being examined by a jury composed of prominent architects, artists, financiers, officials and others. The plans, models and designs are now on exhibition in the Palais des Industries and are exciting considerable interest, says *Le Figaro*. When the prizes were offered 664 aspirants applied for competition, but only 108 of these have completed their works, which now occupy 23 rooms in the Palais des Industries.

As the taking down of the Eiffel tower would cost the French Government 14,000,000 francs indemnity to the owners, besides the expense of demolishing it, most of the projects retain it as a feature and some use it as a basis of more or less ingenious and phantastic monuments. Plan No. 5 shows an immense aquatic castle on the Champ de Mars, which is considered as immersed for the occasion. No. 7 covers the entire Machinery Hall with a number of Russian cupolas and makes it a center of display of electrical illumination. No. 10 covers the entire Champ de Mars with an immense building. No. 14 places a tower on Machinery Hall, topped by an immense globe representing our planet. No. 16 lays parts of the Eiffel tower upon its side and builds two enormous elephants, decorated in East Indian style, and the interior furnished with restaurants, ballrooms, &c.

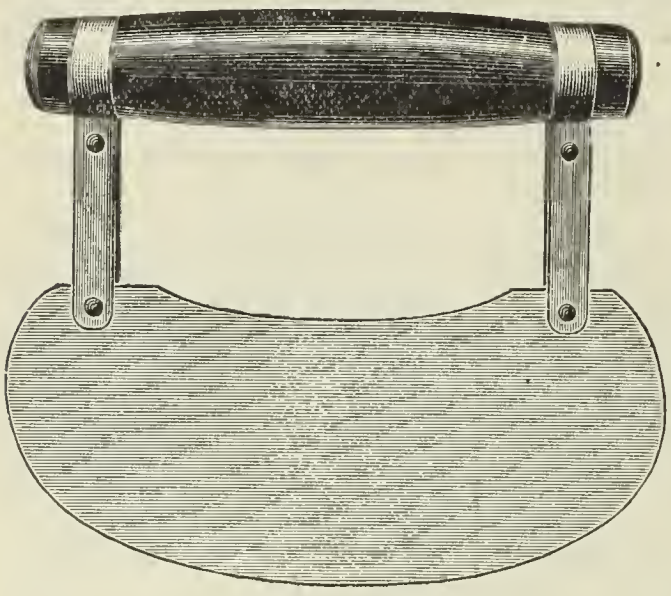
Another project raises the Eiffel tower to 1539 feet, and makes of it a monument of our century, decorating it with sketches from the various periods of our civilization. This projector will also dig a well 9000 feet deep. No. 20 puts in place of the tower a great monumental building as a corner stone for the twentieth century. One architect covers the entire expostion with a glass roof and erects an immense crystal palace. Bridges, columns, viaducts, railroads, mosques, ships, halls, palaces, &c., appear in endless variety.

A very interesting plan, magnificent in its conception, is No. 61. It makes the Palace des Industries the central point and has a straight line boulevard to the Champ de Mars, offering from all points perspective views of the grounds. He changes the Trocadero, turns Machinery Hall into the Art Building, provides for reproductions of the Acropolis of Athens, St. Mark's Place of Venice and principal monuments of architectural art, but retains nearly all the building of the exposition of 1889. This plan has so far found the greatest approval, as it is the most economic, artistic and perfect to all outward appearances.

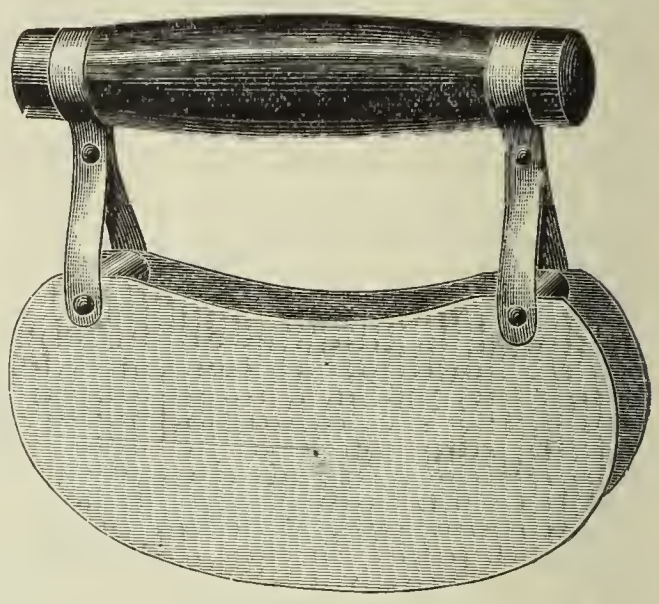
THE RETAIL STORE.

Daisy Mincing Knives.

A. S. Henn & Co., New Haven, Conn., are offering the Daisy mincing knives, as here shown. The blades are attached to the handles by means of steel bands or supports, which are forced around the handle and the two sides riveted together. This method, besides strengthening the knife, it is remarked, keeps the wood handle from splitting. There are three numbers of each style, the handles of all being wood, enameled. Two numbers of each kind have nickel plated tips and two are full nickeled.



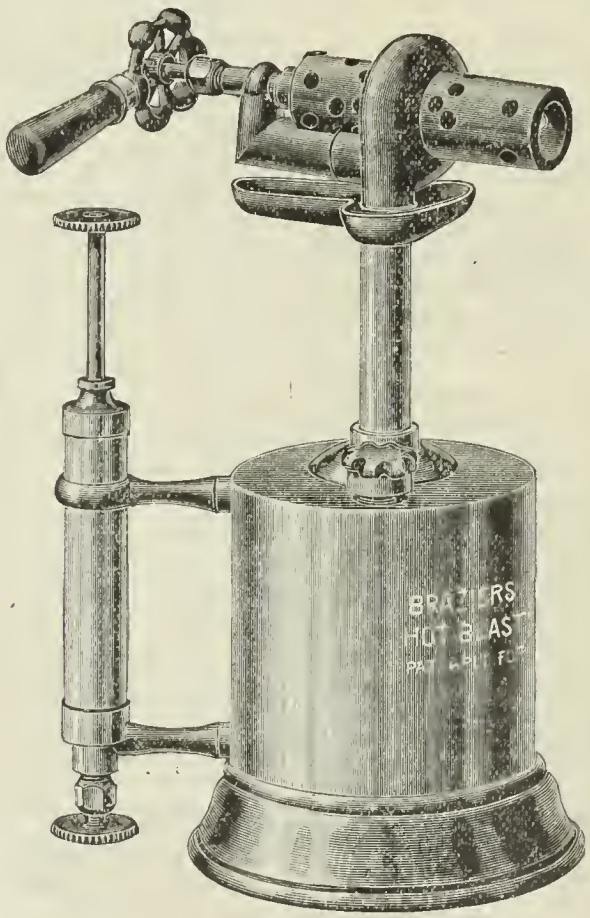
Daisy Mincing Knife, Single.



Daisy Mincing Knife, Double.

Hot Blast Brazier's Furnace.

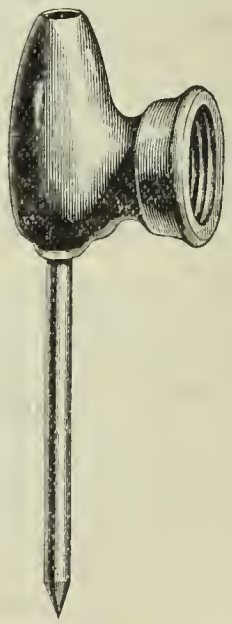
The accompanying cut illustrates a new gasoline brazing torch, made by the White Mfg. Company, 40 and 42 State street, Chicago. It in designed and constructed especially for brazing bicycle frames, band saws and all other light work. It can be used in the open air or against a coke backing. When not in actual use the me may be reduced and still retain the heat in the generator while the work is being prepared for brazing. The method of its use is as follows: Having prepared a joint for brazing, the needle valve is unscrewed to give the full force of the flame; when the job is completed the needle valve is screwed in, which retains the flame in the generator, thus saving the fluid without reducing the heat in the generator; the process may be repeated for two hours without refilling the tank. Every tank is tested to 40 pounds pressure, which is the limit of pressure that can be put on the tank with the pump thereto attached. The tanks are spun from No. 20 gauge bronze metal, the bottom being spun in and soldered. All parts are made interchangeable to facilitate repairs.



Hot Blast Braziers' Furnace.

The Eclipse Lawn Sprinkler.

The Crescent Brass & Iron Works, Detroit, Mich., are introducing for the coming season a lawn sprinkler as here shown. It is made of cast iron, and is japanned in bright vermilion. It is explained that it differs from the Crown sprinkler, made by the same firm, in having no revolving parts, that it cannot be demolished when stepped on, and that it will last a lifetime. The sprinkler is made for ¾ inch hose attachment, and distributes the water evenly, it is claimed, over a circle of 36 feet in diameter.



The Eclipse Lawn Sprinkler.

MEMORANDA.

THE CHICAGO STAMPING COMPANY, Green and Congress streets, Chicago, are constantly bringing out new goods in the line of tinware. They have just put on the market a fine line of funnels, in which the bowl is seamless and beautifully rounded into a bell shape.

THE TRADE will be interested to know that the Excelsior Mfg. Company, St. Louis, have been appointed agents for the sale of the Michigan refrigerators. These refrigerators are favorably known to the trade, having been on the market for some years past. The factory has recently increased its capacity and is in a better position to supply the demand than it has ever been before. Changes and improvements have been made in the refrigerators where they were deemed advisable, thus keeping the line abreast with the times. The Excelsior Mfg. Company are issuing a catalogue fully describing this line of goods, which will be sent to the trade on application.

IT IS NOT often that G. William Gilkey, who is one of the representatives of Lalance & Grosjean Mfg. Company on the road in New England, is caught napping, as he is one of the most active and enterprising of Yankee traveling men, and besides enjoys the distinction of wearing a silk hat with more ease and grace than any other man in the trade, with the possible exception of J. Sidney Smith. As the story goes, Mr. Gilkey recently having some little time to wait in the station at Greenfield, Mass., purchased a book, the title of which is variously given, but the majority agree that it was Ward McAllister's "Guide to Correct Dressing and Deportment." However that may have been, it was so interesting that our traveler failed to notice the lapse of time and allowed the last afternoon express for Boston to pull out without him. Of course this is something likely to happen to any one, but it becomes remarkable in connection with the hero of this incident because it is a proverb that Gilkey never gets left.

THE GRAND RAPIDS REFRIGERATOR COMPANY, Grand Rapids, Mich., send out a little circular that is particularly artistic in its design. It is a small pamphlet measuring only 3½ x 6 inches in size. It begins with a sectional view and description of the Leonard cleanable cold dry air refrigerator, which is the particular product of the Grand Rapids Refrigerator Company. Next comes a variety of amusing and pretty pictures calling attention with more or less directness to the merits of the Leonard cleanable. One of them shows Queen Mab, or one of her Court, charioted upon a Leonard cleanable. Among other beings whose portraits are brought into the story are brownies, salesmen, devils, countrymen, &c. In the middle of the pamphlet two enthusiasts are warmly grasping each other's left hands and swearing eternal friendship with the Leonard cleanable refrigerator.

NOTICE is issued by William M. Pasco, surviving partner of Winegar & Pasco, South Butler, N. Y., under date of January 15, that in order to close up the affairs of the late firm of Winegar & Pasco the entire stock of goods, consisting of shelf and heavy hardware, stoves, ranges, farm implements, paints and oils and all fixtures and lease of the store, &c., are offered for sale. Sales will be made in the usual manner until February 5, when the entire stock will be put up at public auction.

THE FIRM of Lawson & Dean, dealers in stoves, tinware, hardware and pumps, Tulahoma, Tenn., have been dissolved, C. M. Dean retiring, and T. D. Lawson continuing the business.

F. E. BROWNE, Los Angeles, Cal., issues a neat circular relating to F. E. Browne's tea and coffee urn. The coffee and milk jars of this urn are cast iron, porcelain lined outside and inside, and their bottoms are arranged to completely drain the jars. Various other advantageous features are alluded to. A broken view on the front of the circular shows the constructive features of the urn. Another circular issued by F. E. Browne relates to a lamp still for furnishing distilled water for drinking purposes.

THE E. STEBBINS MFG. COMPANY, Brightwood, Mass., have been appointed sole selling agents for the United States for the Little Giant traveling lawn sprinkler made by the Portland Lawn Sprinkler Company. This device was exhibited at the World's Fair and was a source of a great deal of interest, its power of locomotion attracting unusual attention. The particular feature of the sprinkler is that under ordinary water pressure it is able to move itself over the lawn in any direction, either in a straight line or circles, and may be set to travel a definite distance and to go at the rate of from 15 to 500 feet per hour, as may be preferred. It will throw water over a swarth from 5 to 50 feet in width, according to adjustment, and under the average pressure of water will drag 100 feet of hose. The sprinkler has been used in several places and has called forth very complimentary testimonials.

THE RINGEN STOVE COMPANY of St. Louis, Mo., have brought out a line of refrigerators which they are offering under the name Quick Comfort. These goods have been especially built for the company in the hard wood lumber region of Michigan, are finished with great care, and tastefully ornamented and trimmed with solid bronze hinges and locks in antique copper finish. The refrigerators are packed with charcoal and lined with polished zinc. The main points of merit, the manufacturers state, are found in connection with the cold air flues and the waste water trap. The air flues are movable and easily cleaned, being of such construction that they cannot bend, warp or get out of order. The waste water trap is said to overcome the objections urged against the ordinary trap, and is located at the bottom inside of the refrigerator where it is always in sight. It consists of a single piece which can be instantly removed and cleaned. The bottom of the provision chamber of the refrigerator pitches toward the back so that when the chamber is being cleaned it is only necessary to lift out the trap and the water will escape through an opening in the bottom at the rear.

Philadelphia Lawn Sprinkler.

The Philadelphia Lawn Mower Company, Philadelphia, are putting on the market the lawn sprinkler shown in the accompanying illustrations. The sprinkler is made of brass, and, as will be seen from Figs. 1 and 2, consists of a nozzle of cone shape, the upper or discharge end being perforated and having a screwed spud or nipple in its center; screwed to the nipple is a cone with a finely perforated disk forming its discharge end. Fig. 3 shows the sprinkler in operation. The water, in its course from the hydrant, is unobstructed until it reaches the perforated end of the nozzle which divides it into solid streams. The streams strike the

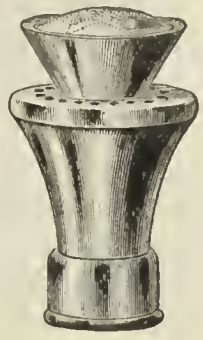


Fig. 1.—Philadelphia Lawn Sprinkler.

upper cone at a point above the plate, and are thus converted into spray, while the water which passes through the spud or nipple forms a fine center spray on its discharge through the finer



Fig. 2.—Sectional View of Philadelphia Lawn Sprinkler.

holes in the disk of the upper cone. By raising or lowering the cone on the nipple the space to be sprinkled may be regulated. Removal of the cone and the screwing of a cap on the nipple converts the sprinkler into a long range sprinkler for garden, lawn or

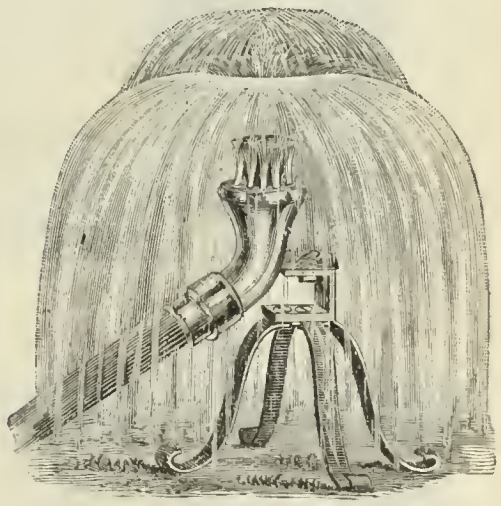


Fig. 3.—Sprinkler with Wrought Iron Stand.

flower use. The sprinkler is supplied in the straight style shown in Fig. 1, with a stand as shown in Fig. 3, with speed attachment for running it to the ground, and with a carriage having a hose reel attachment.

The trend of the cotton manufacturing industry toward the South is indicated in the announcement that five of the largest Massachusetts concerns in that line are now considering plans for the establishment of plants in the Southern States. Two New Hampshire companies have also applied to the State Legislature for permission to build cotton mills in other States. Economy in the price of labor and in freight rates is given as the reason for the projected move.

PLUMBING and GAS FITTING.

The Next Convention.

On the 11th, 12th and 13th of next June the National Association of Master Plumbers will hold their thirteenth annual convention at Philadelphia. The preparations that are being made for this convention will convey to those who attend a correct idea of why Philadelphia is called the "city of brotherly love."

Michigan Master Plumbers.

The principal feature of the third annual convention of the master plumbers of Michigan, which held its two days' session at Bay City last week, was the discussion of the proposed bill which is to be presented to the Legislature. The bill, if passed, will make it obligatory for every plumber to have a license from the State Association before he will be allowed to do any work in the State. The object of this bill is said to be to improve the sanitary condition of business blocks and dwellings and to insure first-class plumbing. At the convention the following officers were elected for the ensuing year:

President, James Meathe, Detroit.

Vice-president, William H. Sullivan, Bay City.

Treasurer, Col. John A. Wheeler, Kalamazoo.

Secretary, Warren C. Weatherby, Grand Rapids.

Acting secretary, Benj. F. Guiney, Detroit.

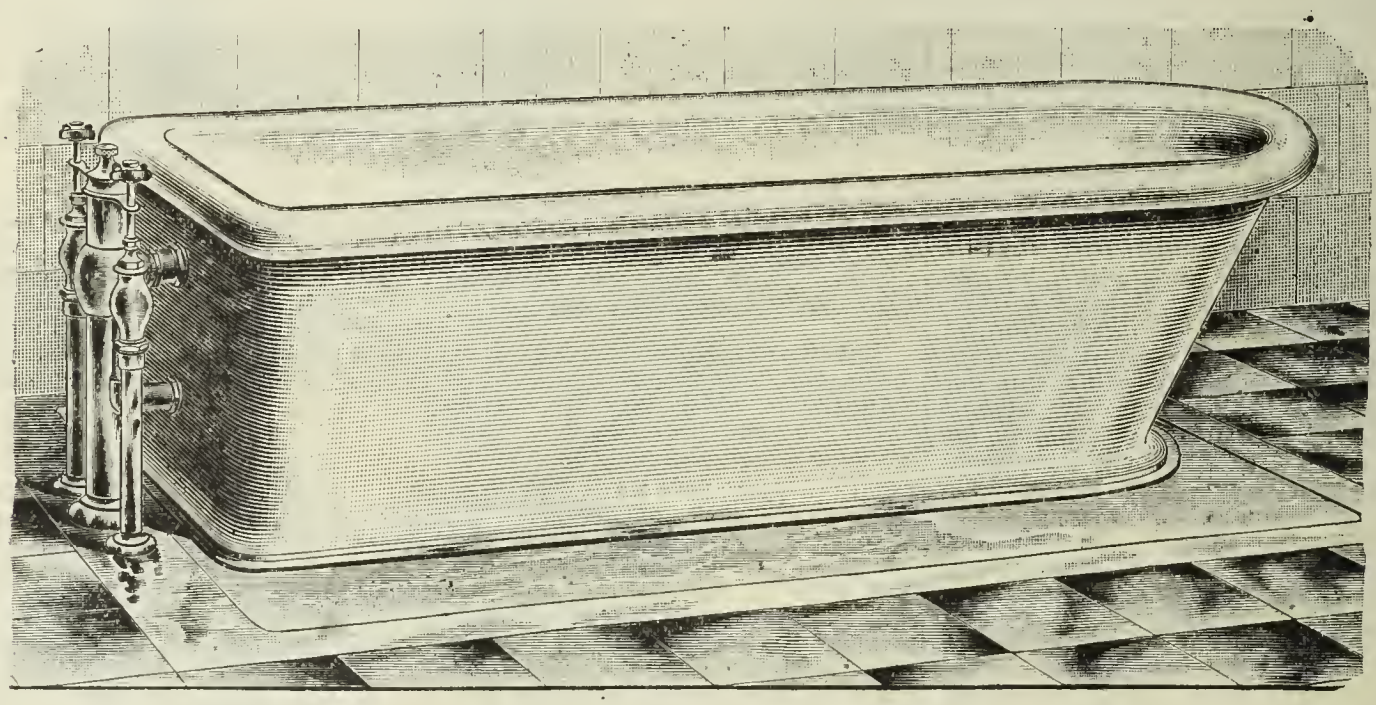
Executive Committee: E. E. Scott, Saginaw; George H. Porter, Jackson; W. W. Armstrong, Lansing.

Delegates to National Convention in Philadelphia: Wm. Lloyd, Manistee, and James Cooper, Pontiac.

A pleasing feature of the meeting was the presentation to President Meathe of a handsome gold watch, chain and charm.

The Puritan Bath.

The Puritan bath with roll rim, which is the subject of the illustration, is manufactured by the Dalton-Ingersoll Company, Boston, Mass., and was patented on August 21, 1894. The features of the bath which are specially noticeable are its sanitary qualities and low hight. It is made to set down on the floor so that its weight is distributed over a wide surface, and there is no possibility of dirt accumulating underneath it. It is 8½ inches less in hight than the standard iron tubs, or about 18½ inches from the floor to the top of the rim, making it especially advantageous for use with children or aged or fleshy people. The tub is of full size inside, and is made in four different lengths, 4 feet 9½ inches, 5 feet 3½ inches, 5 feet 9½ inches, and 6 feet 3½ inches, which is the extreme outside length, including the fittings. The baths are furnished in either porcelain or metallic enamel. Porcelain enameled baths are so well known that no further description is needed. The metallic enameled bath, however, is said to be new in this market, although it has been used in Europe for several years with satisfaction both as to appearance and durability. For smoothness of finish it is said to be superior to porcelain enamel, and should the metallic enamel wear off or become defaced the bath can be refinished in position so that it will look as goood as new, an advantage which needs no further recommendation.

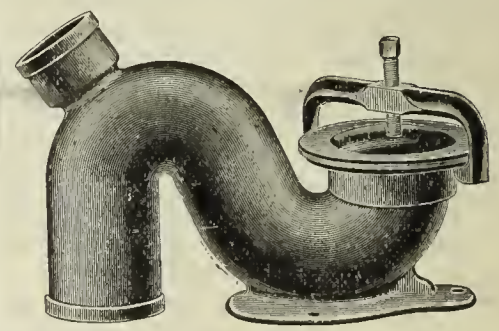


The Puritan Bath.

THE SANITARY INSPECTORS of Minneapolis, Minn., will receive scientific instruction upon the inspection of buildings and premises. The weekly conferences will be begun soon, and at each of them a lecture will be delivered upon some important thing arising in connection with the work of the department. Especial attention will be given to sanitary plumbing and the best and latest methods for the preservation of cleanliness, so that the inspectors will be thoroughly posted upon all matters of antiseptic disinfection.

S. & G. Clamp and Testing Cover.

Sumner & Goodwin, 21 Oliver street, Boston, Mass., are introducing the S. & G. clamp and testing cover for iron hopper traps. The device shown herewith was suggested by the frequent blowing out of the old style testing plugs when in use in cities having laws requiring the testing of all soil pipe connections. As will be seen, the article illustrated consists of a circular rubber packing with corrugated face, which may be applied to the flange of any hopper trap; above this is placed a cast iron flange of same diameter, and to this pressure is applied on the upper side by means of a clamp and set screw.

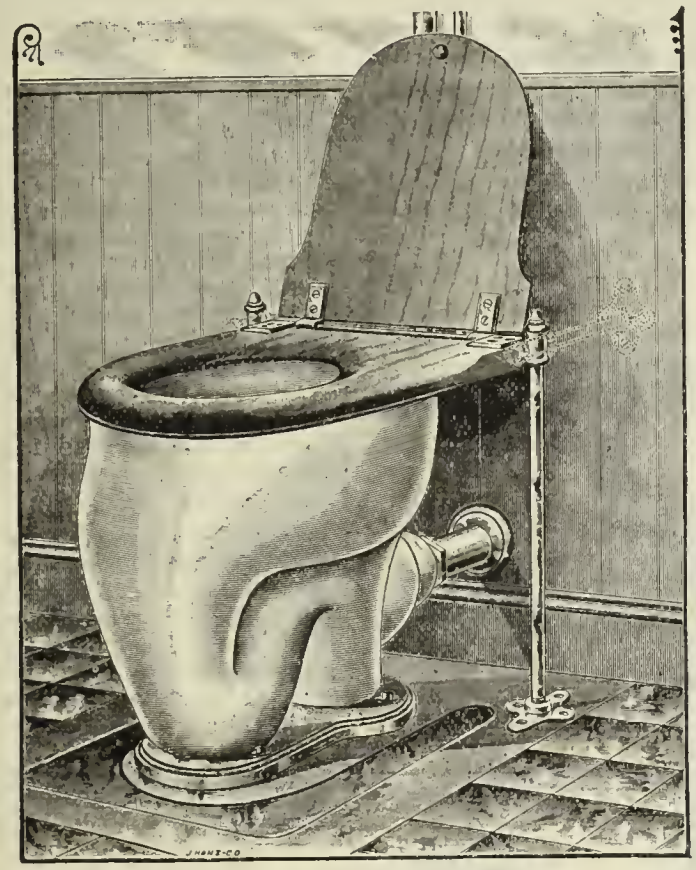


S. & G. Clamp and Testing Cover.

The object in corrugating the rubber disk is to neutralize any little inequalities there may be in the face of the casting. The manufacturers claim that it is impossible for this packing to be blown out.

McDonald's Eureka Seat.

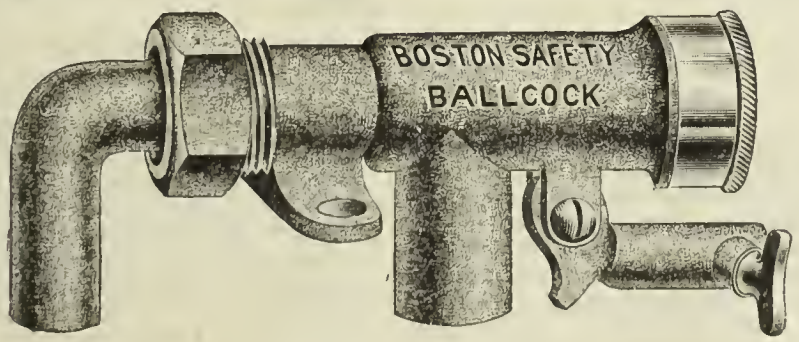
The A. Y. McDonald Company of Chicago have brought out a new seat on which they have applied for a patent. It is illustrated in the cut shown herewith. The special advantage of this seat is that it is clean and open in the back, thereby saving the time of fitting to the wall around the pipes. It can be fastened to the wall or floor as desired, but was specially designed to fasten to the floor, as in many cases seats cannot easily be fastened to the wall. Galvanized or nickel plated fittings are furnished, while the best materials are used throughout.



McDonald's Eureka Seat.

The Boston Safety Ball Cock.

The accompanying illustration shows the Boston safety ball cock manufactured by the Boston Brass Company, 40 Oliver street, Boston, Mass. This ball cock, which is described as noiseless, is designed for high or low pressure, and has, it is stated, been thoroughly tested under different pressures and conditions. It is constructed with a ground seat metal valve in the barrel, which works automatically from the pressure of the water. Whenever it is desired to renew the seat on the plunger worked by the ball float, or to empty the tank for any purpose, all that is necessary is to loosen the thumb screw and take out the ball. Then with the fingers the cap on the end is unscrewed, when the pressure of the water will close the automatic valve, thus shutting the water entirely off and at the same time push out the plunger which can be removed and any work done about the tank or pipes below it without shutting off the main supply. Or the cold water pipes can be tested without tying up the float in the tank. When the plunger is replaced the cap is simply screwed on and the whole thing is in working order. It is stated that the construction of the automatic valve is such that all singing or whistling noise and water hammer are avoided even under the highest pressure. These ball cocks are tested before leaving the factory and made with heavy copper balls and rods ⅜ inch in diameter.

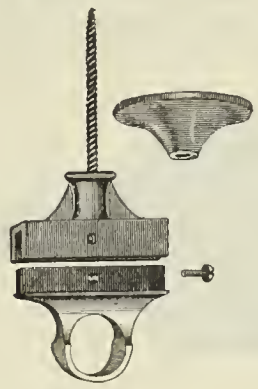


Boston Safety Ball Cock.

E. W. Stradling, E. J. Stradling, E. H. Bice, A. H. Dobson and John J. Droz were elected directors of the Stradling Plumbing & Heating Company, Utica, N. Y., at the annual meeting last week. The directors elected these officers: E. W. Stradling president; E. H. Bice, vice-president; E. J. Stradling, secretary; A. H. Dobson, treasurer.

Perfect Brass Pipe Hanger.

The increasing use of brass pipe in plumbing work has made a demand for suitable hangers for attaching the pipes to wall or ceilings. A very neat device for this purpose is manufactured by David L. Billings, 35 Hancock street, Dorchester, Mass., which we show in the accompanying illustrations. Fig. 1 shows the separate parts of a single hanger, while Fig. 2 shows a triple hanger ready for use. Referring to Fig. 1 it will be seen that the hanger consists practically of two parts. The upper yoke has a screw attached for fastening to the wall or ceiling, and in the bottom of the yoke is a longitudinal slit into which fastens the lower part of the hanger carrying the ring for holding the pipe. The piece fits into the socket, and is held in place by a screw passing through a hole in the metal. A small brass ceiling plate gives a finish around the screw at the top. The hanger is made entirely of brass highly polished and finished with either a flat or raised flange. In addition to the two styles illustrated there is also a double hanger. Special attention is directed to the simplicity of the device and the short time required to put it in place. The parts are interchangeable, which allows different sizes of pipes to be supported with the same hanger.



Perfect Brass Pipe Hanger.—Fig. 1.—Separate Parts of Single Hanger.

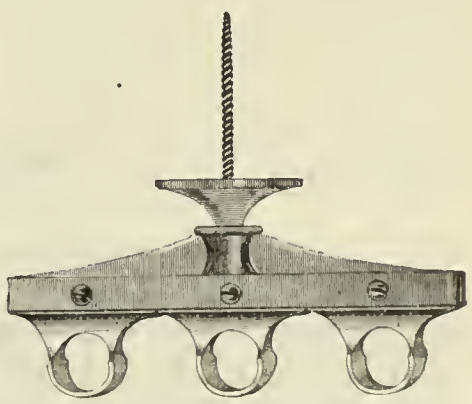


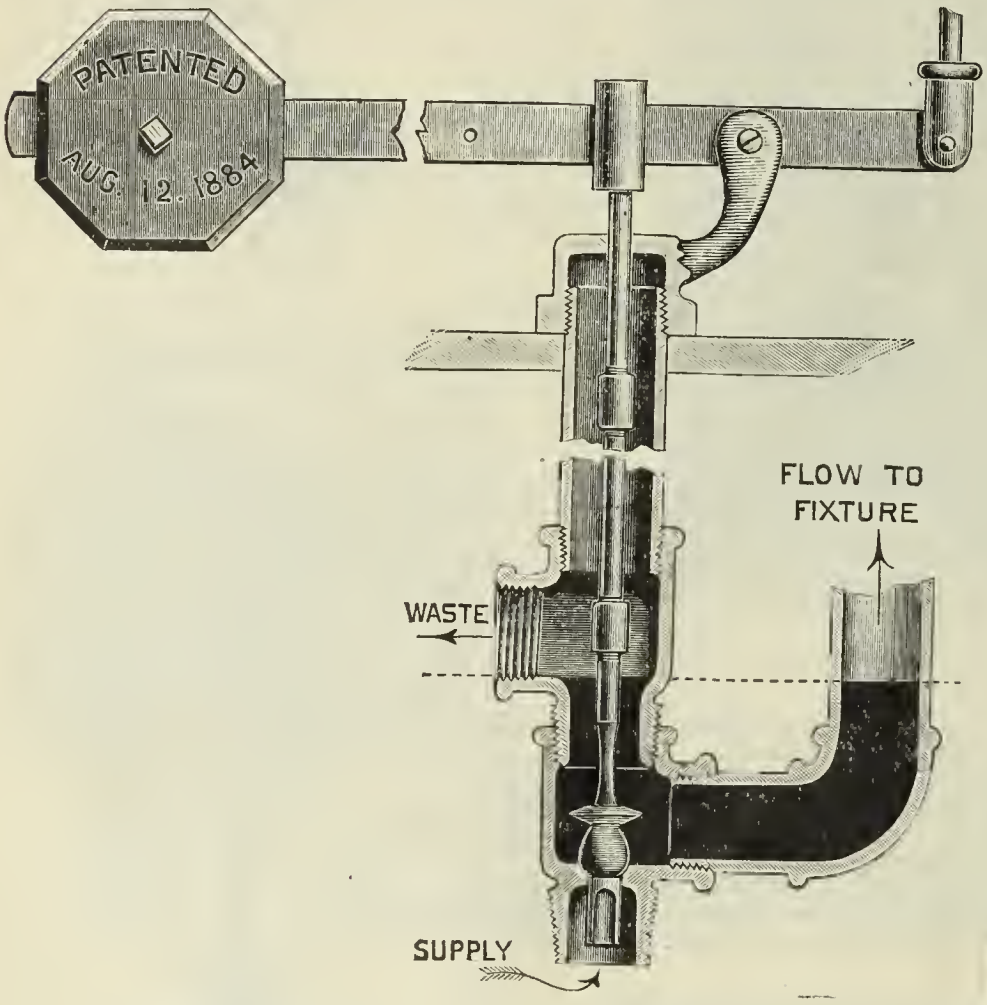
Fig. 2.—Triple Hanger Ready for Use.

The 1895 catalogue of the Zero Valve Company, 212 Seneca street, Buffalo, N. Y., has just reached us. Both the Zero and the Vollmer Anti-Freezing Closet Valves are illustrated and described, and we notice a new Zero Self Closing Stop and Waste Cock. Other pages show the Vollmer closet seat, which is a swing or lift seat, adapted for hopper closets. Their

valves and seats are also shown in connection with closets. The IXL Vent Cap is said to be a simple and durable affair that can be adapted to the hub end of any soil pipe by simply adjusting a set screw.

Zero Self Closing Stop and Waste Cock.

The illustration presented herewith shows the Zero self closing stop and waste cock for use in connection with any fixture that is exposed to the weather. It is so designed that it can be buried in the ground and does not require a vault or box to be built around it. From the cut it will be noticed that on opening the valve the supply water flows up a separate pipe to the fixture, and does not flow up the pipe



The Zero Self Closing Stop and Waste Cock.

in which the rod is placed which works the valve, and the valve is so arranged that it prevents the water flowing up in this pipe, preventing the rod or its casing from becoming gradually incased in ice and interfering with its operation. The waste being the full size of the pipe the probability of the waste being stopped is removed. It is further stated that when the valve is closed to stop the water supply the waste is so located as to prevent the entrance of sewer air, as the valve is effectually trapped. In case repairs are needed it is not necessary to dig the valve out of the ground, as it is arranged to use iron pipes, which may be unscrewed from the valve seat and the valve removed. The valves are made with rods and casing in lengths of 3½, 4 and 4½ feet.

Out of 50,000 boys who graduated from the senior department of the Board Schools of the city of London during the year ended May 31, 1893, and whose subsequent occupations were recorded, 123 became plumbers.

TRAPS AND VENTS.

The business heretofore existing under the name of H. L. Tillinghast & Co., Providence, R. I., will on January 31 dissolve, and after that it will be continued as the H. L. Tillinghast Supply Company, Incorporated.

O. H. Jones, representing the F. W. Foster Mfg. Company, Boston, Mass., was in New York this week visiting the plumbing trade in the interest of the Foster high pressure ball cock.

The Zero Valve Company, 212 Seneca street, Buffalo, N. Y., inform us that the Vollmer patents have been granted for the different self-closing valves which they manufacture.

A spirited and closely contested election for officers of the Master Plumbers' Association for the ensuing year was held at Elk's Hall, St. Louis. The election resulted in a great deal of wire pulling. Jeremiah Sheehan, who was defeated by William McMahon for the presidency, has been the presiding officer of the local assembly for two terms, and was once president of the National Association. Following is a list of those elected: President, John Mahon; vice-president, W. H. Kuhns; second vice-president Wm. Schwehr; recording secretary, Wm. F. McCormack; financial secretary, John P. Kelleher; treasurer, E. J. Lonergan; sergeant-at-arms, A. J. Gallagher.

The monthly meeting and dinner of the Plumbers' Supply Association were held at the Quincy House, Boston, last week. President Frank J. Knox of Hartford sat at the head of the table. The after dinner exercises were entirely devoid of formality and no business of interest was transacted.

Representative Elliott of New Haven, Conn., introduced to the Legislature at Hartford last week the bill to control plumbing in the State.

The plumbing firm of Murray & Wacker, College Point, N. Y., have dissolved partnership, and the business is now carried on by George Wacker alone.

The Rochester Lead Works, William S. Mandeville and Frank E. Shepard, proprietors, Rochester, N. Y., are to build a new plant especially adapted for the requirements of their business. The firm are extensive dealers in pig lead, pig tin and antimony, and large manufacturers of lead pipe, block tin pipe, tin lined lead pipe, solder and babbitt metal, and in making a selection for their works decided to locate near the railway. They have just purchased the coal yard property at the corner of Exchange and Edinburgh streets. The ground space gives 53 feet on Exchange street, and runs back on Edinburgh street 180 feet, backing up to the Erie tracks, where a switch will be laid for a track for unloading and loading cars. A modern two-story brick factory is to cover the entire ground space, and work on the new building will commence as soon as the plans are drawn and contracts let.

Lead pipe thieves are at work in the lower section of the city of Philadelphia to such an extent that the police are kept busy trying to catch them, while at the same time warning all real estate dealers to look after the fastenings of doors and windows of vacant houses.

The plumbing establishment of Cunningham & Stowe, Marion, Ohio, was visited by fire last week. Insurance covers the loss.

The Broadway Plumbing Company were incorporated, at St. Louis, Mo., with an all paid capital stock of $1000, to carry on a general plumbing, gas and steam fitting business. The shareholders are J. M. Life and Thomas Bond, each of whom owns 40 shares, and J. J. Shaw, 20 shares.

Macumber & Johnson of Worcester have leased a store in the Bugbee House block, Putnam, Conn., where they have established themselves in the business of plumbing, steam, water and gas pipe fitting.

A letter has been issued to the builders and contractors of Detroit, Mich., by W. E. Johnson, clerk of the Bureau of Sanitary Plumbing of the Health Department. The letter is issued as the result of several complaints in this direction where builders have paid for the plumbing and afterward found that it was not satisfactory to the bureau, necessitating changes and further expense. The Plumbing Bureau therefore advises that settlement be withheld until the plumber presents the certificate of final inspection by the department. The letter reads as follows: "An important section of the rules of the Board of Health governing sanitary plumbing and house drainage is: 'When work is completed and tests are satisfactory to the Plumbing Inspectors, a certificate of approval will be issued to the plumber by the inspector.'"

The local press of Dubuque, Iowa, freely praise W. S. Molo for the heating plant and plumbing work done in the new High School Building.

The New Haven Gas Light Company, New Haven, Conn., have voted to reduce the price of gas from $1.50 to $1.25 per 1000 cubic feet, to take effect

from March 1 next. At this figure gas can be profitably used for fuel, and the plumber will find it of advantage to make a push on the pipe fitting necessary for the use of gas stoves and to carry a selected line of gas cooking stoves.

THE FIRM of E. K. Lockwood & Co. of Norwalk, Conn., plumbers, steam and gas fitters, have been dissolved and will hereafter be known as the Jones-Hotchkiss Company, the members being F. I. Jones and H. E. Hotchkiss, E. K. Lockwood retiring.

THE CITY OF WATERBURY, CONN., says the New Haven *Record*, has reason to be proud of her new water works that have been under construction for some time past. The supply was tested last week with highest success, meeting in every way the expectations of the projectors.

A MASTER PLUMBERS' ASSOCIATION has been formed at Harrisburg, Pa., with the following officers for 1895: President, E. C. Rauch; vice-president, J. Wesley Neil; secretary, James H. Lutz; treasurer, John A. Kramer.

J. J. CROWLEY, Hyde Square, Mass., in connection with his plumbing business on Lamartine street has opened a new place on Massachusetts avenue in the Back Bay.

THE COMBINATION SINK AND TRAP formerly made by Johnston & Meyer, St. Louis, and recently illustrated in these columns, is now being made by the Pleuger & Henger Mfg. Company, St. Louis. The device has many points of merit claimed for it by the manufacturers, who are preparing a circular describing same, which will shortly be issued to the trade.

THE TORONTO STEEL CLAD BATH AND METAL COMPANY, Limited, Toronto, Ontario, at the recent convention of the Ontario Architects' Association held in Toronto, distributed as a souvenir a small memorandum book which is an exceptionally useful and pretty article. It is bound in fine leather and contains a removable memorandum book made up of both blank and ruled pages. On the front cover is a picture in gilt of the steel clad bath and the inscription, "Souvenir O. A. A, 1895. Compliments of the Steel Clad Bath and Metal Company, Limited."

A READING, MASS., plumber failed to comply with the law and had to do a job a second time to escape a fine.

WE HAVE PLEASURE in acknowledging an invitation from President Ahern to attend the Fifth Annual Convention and Banquet of the Connecticut Master Plumbers' Association, to be held at the Waterbury City Hall, Wednesday, February 6.

LAKE PLUMBING COMPANY have been incorporated at Chicago with a capital stock of $2700 to do a general plumbing business. The incorporators are William T. Payne, Guy C. White and Joseph B. Burtt.

IN the early part of 1893 the Master Plumbers' Association of Philadelphia decided to test the legality of the mercantile tax upon the plumbers. The test was made in the case of John Gormly, 1433 Columbia avenue, who was taxed $7, besides 50 cents as the city fee for issuing the license. The court decided the case in favor of Mr. Gormly to the satisfaction of President Eyanson and Secretary Clark of the association, as well as the 300 members, all of whom gave their support to Mr. Gormly.

WILLIAM HEAP has purchased the business of the Heap Manufacturing Company, at Muskegon, Mich., and will enter business for himself. He will build a new factory and manufacture sanitary goods.

A. F. HARVEY, Gloucester, Mass., has sold his stove and plumbing business to James S. Smith.

THE CONTRACT for repairs, &c., in the Garden Street School at Pawtucket, R. I., was awarded to the Pawtucket Steam & Gas Pipe Company.

J. M. WHITE, Bristol, Conn., has purchased the interest of his partner in the plumbing business.

THE PLUMBING ESTABLISHMENT of Leonard D. Hosford, at 43 Beekman street, New York, was visited by fire last Monday.

The Metal Worker acknowledges the courtesy of the Association of Master Plumbers of New York City in the receipt of tickets for their annual entertainment and ball, to be held in the Lexington Avenue Opera House on February 12.

COUNCILMAN DURFEE of Providence, R. I., presented a resolution directing the city solicitor to apply to the general assembly for certain legislation relative to the plumbing laws, which was passed. The object of this is to elect the inspector of plumbing biennially and to allow the city council to amend the plumbing ordinances.

Montreal Master Plumbers.

The Master Plumbers' Association of Montreal held its regular meeting Thursday the 17th; a large number attended, and much business of importance was transacted. President Lamarche announced that he had received notice of the passing of the act of incorporation by the provincial legislature, and that now the association was in possession of all the rights and responsibilities of a regularly incorporated company. It was decided to celebrate the inauguration of the association and the attainment of corporate rights by a banquet to be held in February. A committee was struck with full power to carry the business to what cannot but be a successful conclusion. The sanitary and legislative committees reported the completion of their work of revising the City Plumbing By-Law. It was resolved that the executive committee at once communicate with the civic authorities, with a view to getting the by-law amended, as suggested by the report of legislature and sanitary committees, and to take steps toward the better enforcement of the by-law.

A letter was received from the secretary of the Council of Arts and Manufactures reporting that the plumbing class was making excellent progress, and requesting the association to make suggestions as to a course of drawing for the class; referred to apprenticeship committee. A number of new members were added to the roll, which now contains the names of all the leading firms of the city. A master plumbers' association is about to be formed in the city of Quebec. The Montreal master plumbers are to be congratulated on the rapid progress made since their inauguration, only a few months ago. One of the leading physicians and surgeons of the city has kindly consented to lecture before the association in French and English. We believe the subject of the doctor's discourse will be the close connection between successful surgery and good plumbing. This is a phase of the sanitary question that has not received the attention that its importance deserves from leading surgeons.

News and Notes.

The Brazilian Government has ordered $5,000,000 worth of war material from the Armstrong Gun Company of England.

The "good roads" question is being actively agitated in New York State, and the employment of convict labor in this work is urged.

The House Committee on Labor has ordered a favorable report on the bill of Congressman Phillips of Pennsylvania, authorizing the President to appoint a commission of 15 members, including five representatives of labor, five business men and five farmers, to meet the problems presented by labor, agriculture and capital. The Commission is expected to exist for two years. It is designed to furnish Congress with information and suggestions as to laws that may be made a basis for uniform action by the various States in order to harmonize conflicting interests and to be equitable to the laborer, employer, producer and consumer.

Industrial reports from the South show a general tendency toward increasing business activity throughout that section. Several very important enterprises are being projected, with some assurance of their being carried out. Among them are two extensive steel plants, several large cotton mills and a number of mining enterprises.

A steel bridge across the St. Croix River, connecting Calais, Maine, with St. Stephen, N. B., was formally opened January 18.

Fifteen of the 25 regiments of United States infantry have now been supplied with the new Krag-Jorgensen rifle, and it is expected that, at the present rate, all the infantry regiments will be armed with this weapon before another three months have passed.

A system of water works has just been completed at Portland, Ore., at a cost of $2,000,000. The supply comes from Bull Run River, and is brought a distance of 40 miles.

The foreign trade returns of the port of New York for the month of December, 1894, show an aggregate gain of $15,725,000 as compared with the corresponding month of 1893. The increase is mainly due to heavy importations, which were nearly $12,000,000 greater than those of December, 1893. For the calendar year, however, the volume of foreign trade exhibits a falling off as compared with that of the previous 12 months, the aggregate of 1894 being $933,171,045, against $1,068,919,917 in 1893, and $1,053,756,430 in 1892. Imports of free goods were heavy, being $239,332,660, against $296,318,647 in the previous year and $154,025,758 in 1892. The value of dutiable goods imported, $203,537,304, is the smallest since 1879, and $38,845,205 less than recorded in 1893. Exports of domestic produce, $332,670,015, fell $15,412,513 behind 1893. Imports of specie were $20,669,377, against $65,827,758 in 1893, and exports, $129,003,594, against $106,398,025.

A bill is now pending in the Legislature of the State of Alabama to exempt from taxation for ten years all new industries which have an actual investment of $25,000.

TIN PLATES.

Tin Statistics for 1894.

The drop in the price of pig tin last year is readily accounted for by the large increase in the output of the metal. According to French & Smith's circular, the Straits settlements shipped 46,119 tons of tin in 1894, against 39,782 tons in 1893 and 34,150 tons in 1892. Australia exported 5821 tons, against 5722 tons in 1893. Sales of Banca and Singkep amounted to 6100 tons, against 5418 tons in 1893. Sales in 1895 will, it is said, be further increased. From Billiton about 500 tons less was received than in 1893, and the production of the Cornish mines is estimated to have also been about 500 tons less. Other sources of supply are also opening out. From Bolivia the receipts are steadily increasing, and with better transit facilities the output of the mines in that country is gaining in importance. Some parcels of high grade tin ore have also been received in England from South Africa.

New Tin Plate Scale.

We print below the new tin plate scale adopted in conference in Pittsburgh January 15, and which took effect the next day, to continue in force until June 30, 1895:

TIN AND BLACK PLATE MILLS.

It is agreed that at a 1⅛-cent Western Iron Association card the prices for rolling, shearing, doubling and heating on a tin and black plate mill shall be as follows, with 2 per cent. additional for each 1/10 advance of said card, and 2 per cent. decline for each deduction of 1/10 to 1⅛-cent card:

Gauges.	Rolling steel. 2,240 pounds.	Doubling.	Heating.	Shearing on jaw or crocodile shears, and job work on squaring shears.
Nos. 8 to 11	$2.04	$0.93	$0.85	$0.99
Nos. 12 and 13	2.13	.96	.90	
Nos. 14 and 15	2.45	1.10	1.07	
Nos. 16 and 17	3.24	1.46	1.32	1.52
Nos. 18 to 20	3.62	1.63	1.48	
Nos. 21 to 24	3.96	1.86	1.63	
Nos. 25 and 26	4 00	1.86	1.69	1.52
Nos. 27 and 28	4 01	1.96	1 82	
Nos. 29 and 30	4.50	2.36	2.17	1.54
No. 31	4.59	2 48	2.33	1.56
No. 32	4 80	2.60	2 44	1.65
No. 33	5.09	2.74	2.52	1.73
No. 34	5 64	2.91	2.76	1.93
No. 35	5 92	3.08	2.92	2.01
No. 36	6.32	3.15	3.03	2.15
No. 37	6 39	3.19	3 08	2.18
No. 38	6.46	3.26	3.13	2 21

1. Thirteen per cent. less than above prices for iron, except shearman.

2. Shearman on modern squaring shears to receive $1 per turn, but for 25 gauge and lighter, 87½ cents per turn shall be paid. This clause only applies for shearing tin plate.

(The above changes made in scale of 1894 and 1895 by conference January 15, to take effect January 16 and maintain until June 30, 1895.)

EXTRAS.

3. Twenty per cent. added for changed steel and 20 per cent. on net price of iron.

4. Seventeen per cent. added for pickle finished iron and steel, except shearman

5. For all sheets sheared into circles on tin and black plate mills where the loss exceeds 10 per cent. 20 per cent. extra shall be paid.

6. That all sheets cut down to smaller sizes on tin and black plate mills be paid for at scale prices.

Following is the old scale, which we present for purposes of comparison. The extras remain unchanged, but for shearing the old scale made the price for all gauges $1 per turn.

Gauges.	Rolling steel. 2,240 pounds.	Doubling.	Heating.	Shearing on jaw or crocodile shears and job work on squaring shears.
Nos. 8 to 11	$2.04	$0.93	$0.85	$0.99
Nos. 12 and 13	2.13	.96	.90	
Nos. 14 and 15	2.45	1.10	1.07	
Nos. 16 and 17	3.24	1.46	1.32	1.59
Nos. 18 to 20	3.62	1.63	1 48	
Nos. 21 to 24	4.07	1.86	1.63	
Nos. 25 and 26	4.57	2.07	1.88	1.71
Nos. 27 and 28	4.63	2.21	2.05	
Nos. 29 and 30	5.30	2.70	2.48	1.76
No. 31	5 40	2.84	2.66	1.78
No. 32	5.65	2.97	2.79	1.88
No. 33	5.99	3.13	2.88	1.98
No. 34	6.64	3.33	3.15	2 20
No. 35	6.97	3.52	3.34	2 30
No. 36	7 43	3.60	3.46	2.46
No. 37	7.52	3.65	3.52	2.49
No. 38	7.60	3 72	3.58	2.52

British Tin Plate Exports in 1894.

Great Britain's total exports of tin and terne plates during the year 1894 show a decrease of 25,891 tons in quantity and of $5,077,198 in value as compared with the figures for the previous year. The figures given in the Board of Trade returns are as follows: 1893, 379,172 tons, valued at $25 958 240; 1894, 354,081 tons, valued at $20,881,042. Tin plate shipments to all countries in the last three months of the year, however, exhibited a considerable gain as compared with those in the corresponding period of 1893, December's increase in this respect being as much as 14 421 tons, 10,600 tons of which are accounted for by the comparative increase in exports to the United States in the last month of the year. The following table gives the amounts of British tin and terne plates sent to foreign countries during the past two years:

Exported to.	12 Months.	
	1893. Tons.	1894. Tons.
Russia	30,527	23,965
Germany	3,126	3,765
Holland	5,312	5,184
France	11,297	10,416
Portugal, Azores and Maderia	5,862	2,951
Italy	4,004	2,967
Roumania	4,286	4,675
United States	255,603	226,879
Brazil	4,329	5,316
Argentine Republic	3,299	3,200
British East Indies	6,190	7,974
Australasia	7,694	11,729
British North America	16,000	17,393
Other countries	21,633	27,667
Totals	379,172	354,081

SCRAP.

JOHN JARRETT of Pittsburgh writes to the New York *Herald* that, in his opinion, with the slight reduction in wages agreed to by the tin plate workmen, the American mills can be operated with a fair percentage of profit, and in two years' time so increase the output as to control entirely the home consumption.

TEN of the leading canning factories of Baltimore, which have been shut down since October 1, started into operation again on Monday. Other idle plants in the same business are likely to follow suit. This will mean an augmented demand for coke tin plates.

THE LEECHBURG FOUNDRY & MACHINE COMPANY, Pittsburgh, Pa., have contracted to furnish to the Falcon Tin Plate & Sheet Company, Niles, Ohio, a Mesta pickling machine, having a capacity of about 10 tons of black plates per hour.

EXPORTS of native pig tin from Great Britain in 1894 were valued at $2,074,512, and foreign tin at $7,310,626. Both totals show a decline in value, though the quantity of foreign tin reexported last year exhibits an increase.

THE COPARTNERSHIP between George C. Waldo and Frederick R. Phillips, trading as the Phillips Tin Plate Company of Philadelphia, has been dissolved by mutual consent, Mr. Phillips having purchased the interests of Mr. Waldo therein. The tin plate manufacturing business of the concern will be conducted by Frederick R. Phillips at the same location in Philadelphia, under the name of the Phillips Tin Plate Company, 918 Filbert street. The works of the concern are situated at Susquehanna avenue and Philadelphia & Reading Railroad.

THE WHOLE of the men, numbering about 1000, employed at the Cwmfelin Tin Plate Works, Swansea, Wales, were last week given a month's notice, terminating their engagements. There has only been one brief stoppage of these works in the past 25 years. E. Rice Daniel, the managing partner, stated publicly that the notices were given, not with the intention of closing down the works or reducing wages, but to enable the works to be kept going from day to day, until the market becomes sufficiently settled to justify the renewal of customary labor contracts.

REYNOLDS BROS. CAN COMPANY, Havre de Grace, Md., advise us that the report that they have the intention to manufacture tin plates is erroneous. The firm of Reynolds Bros. have been engaged since 1880 in the manufacture of fruit cans, and they also hold various patents in can making machinery. Their product in this line is known in all sections of the country, and they propose to confine themselves thereto. The concern were incorporated on January 1 last as the Reynolds Bros. Can Company.

A PRESS CABLE dispatch from Swansea, Wales, reports that at the annual meeting of the Chamber of Commerce of that port, on January 23, Sir John Jones Jenkins, chairman of the Swansea Harbor Trust, addressed the members, saying that the Welsh tin plate industry was threatened with severe competition from the United States, where tin plates would be extensively manufactured in the future. The decline in the Welsh trade being entirely in the shipments to America, he believed that other markets might be opened to make good the loss of trade with this continent. Already, he said, more shipments were sent from England to Russia than were sent to the whole world 40 years ago.

THE CHICAGO STAMPING COMPANY, Green and Congress streets, Chicago, have on exhibition in their sample room some of the new tin plate from which they will hereafter make their milk cans. The plate is of No. 18 gauge and has an unusually lustrous surface. It is made in their own tin plate factory on the premises. The new Morewood tinning machine is used and the company are highly pleased with the excellence of the work which it turns out. It is the intention of the company to begin at an early day the manufacture of a full line of roofing plates and bright plates for the trade.

THE LEECHBURG FOUNDRY & MACHINE COMPANY, Pittsburgh, Pa., have received an order for a Mesta patent pickling machine for the La Belle Iron Works, Wheeling, W. Va., to be placed in the new tin plate plant now being erected by that concern.

THE NEW CASTLE STEEL & TIN PLATE COMPANY, New Castle, Pa., manufacturers of tin and terne plate, have closed a contract with the Morgan Engineering Company, Alliance, Ohio, for a considerable amount of electrical machinery. The order consists of electric cranes and other time and labor saving machines for the manufacture of tin plate.

THE WORKS of the Tiryda Tin Plate Company, Ammanford, South Wales, have restarted this week, owing to concessions made by the workmen.

MCCLURE & Co., tin plate and metals, Pittsburgh, Pa., are furnishing their friends with a memorandum book which is sure to be highly appreciated. It is well gotten up, having a leather back, and the sheets are held together in a clasp, and when all have been used a new pad can easily be inserted. This firm are meeting with an excellent demand for McClure's redipped roofing tin, which is guaranteed to contain 35 pounds of coating per 112 sheets. It is a recognized fact that a very important point in a roofing plate is to secure a uniform coating. This firm state that the above brand of roofing tin is made by a process by which the coating is distributed evenly over the sheet, leaving no thick edges to interfere in working the sheets.

THE TIN PLATE PLANT of the St. Louis Stamping Company, St. Louis, Mo., has been shut down pending settlement of the wage scale with their workmen.

FOLLANSBEE BROTHERS COMPANY, successors to James B. Scott & Co., Pittsburgh, Pa., distribute a neat little circular calling attention to Scott's Extra Coated guaranteed roofing tin. Instead of filling the entire pamphlet with their own claims for the ware they let others who have used the plates record their experiences. A number of testimonial letters, which are printed in *fac-simile*, speak in the highest terms of this plate.

THE BRITTON ROLLING MILL COMPANY, Cleveland, Ohio, started up one tin plate mill on Monday, the 21st inst., and will have two mills in operation as soon as shipments of tin plate bars are ample. The wages paid will be on the basis of the 30 and 25 per cent. reductions proposed by the manufacturers, and the plant will be operated non-union.

M. M. GARLAND, president of the Amalgamated Association, was in Cambridge, Ohio, last week, for the purpose of organizing a lodge of tin plate workers among the employees of the Morton Tin Plate Company at that place.

LAST WEEK a charter was issued to the Pennsylvania Tin Plate Company of New Kensington, Pa., with a capital stock of $200,000. The directors are: Barthold Goldsmith of Pittsburgh, Philip Goldsmith, Louis Goldsmith, David Frankenberg and Edward Dinkelspell of New York City. The plant of this firm is rapidly approaching completion, the contract for its erection having been placed some months since with the Frank Kneeland Machine Company of Pittsburgh, Pa. It will be a modern plant throughout, and the concern will roll their own black plates.

THE ANNUAL MEETING of the Association of Iron and Steel Sheet Manufacturers of Pittsburgh was held in that city last week. The election of officers resulted as follows: J. G. Battelle, Piqua, Ohio, president; W. T. Graham, Bridgeport, Ohio, vice-president; John Jarrett, secretary-treasurer. Directors: B. M. Caldwell, Warner Arms, N. E. Whitaker, W. C. Cronemeyer and B. F. Jennings.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

N. W. SHOWACRE has awarded the contract for heating 22 houses that he is building to F. O. Singer & Co., Baltimore, Md. They will use the Fuller & Warren Company's No 300 hot water boiler, installed according to plans prepared by J. J. Wilson.

CONTRACTS have been awarded by the Public Buildings Commission, at Philadelphia, to McCambridge & Co. and Claridge & Bartholemew for the plumbing supplies for the ensuing year.

THE CONTRACT for heating the Commercial Club, at Richmond, Ind., has been let to Border Bros. of Columbus, Ohio.

GREEN & LOGAN, Bridgeport, Conn., have the contract for the heating and plumbing for a new house being built by Wm. Burg.

AT THE RECENT MEETING of the Norwalk (Conn.) Hospital Association it was voted that the new hospital building should cost not less than $10,000, and the executive committee was authorized to secure definite plans for the structure.

WM. F. DONNELLY, New Haven, Conn., is to erect a flat building to have a hot water heating plant and a plumbing system.

THE NEW HAVEN HEATING AND PLUMBING COMPANY, New Haven, Conn., have taken the contract for heating the new Winchester Building. A Bigelow boiler and the H. B. Smith Company's Royal Union radiators will be used. They also have the contract for placing two Rapid heaters in Theo. R. Blakeslee's new house.

BOTSFORD & ENGLISH, New Haven, Conn., have the contract for the plumbing in the residence building for J. D. Hildreth, and for the residence of Mrs. Ives.

S. J. FREEMAN, Hartford, Conn., will expend $13,000 in remodeling his building, and among the improvements will be a hot water heating plant and a plumbing system.

CLARKSON, SCOTT & Co., Philadelphia, Pa., have been awarded the contract for furnishing an extensive heating plant for the Presbyterian Home for Widows and Single Women at Fifty-eighth street and Woodland avenue.

THOMAS BRADFORD, Danielsonville, Conn., has the contract to put in the steam radiators for Phœnix Hall. There will be six in number, making 600 feet of heating surface in all.

THEODORE PERKINS & Co., Canandaigua, N. Y., have been awarded the contract for putting the steam heating apparatus in the new county jail.

JAMES AHERN, Hartford, Conn., is erecting three houses of two flats each in his city, and it is needless to say that a plumber will have to bid low to get the plumbing contract.

B. D. DUGGAN, 207–209 Lake street, Chicago, will put two No. 621 Richmond furnaces in the flat building of Joseph Leclere, 62 Sawyer avenue, and one No. 210 Richmond furnace in the building of E. Besenthal, Leavitt and Division streets.

THE EXETER MACHINE WORKS, 32 Oliver street, Boston, Mass., are furnishing two large Exeter steam boilers and a carload of Exeter radiators for the block at Hudson, Mass., for which Alines & Keeler have the heating contract. They are also furnishing a large Exeter boiler and Exeter radiators for the Morse Block, Sharon, Mass.

GEORGE L. ROOD, 79 Lake street, Chicago, is to install a Royal steam heater in the flat building of Garner Bros., Garfield boulevard and Halsted street.

THE CHARLES H. SIMMONS COMPANY, 72–74 Market street, Chicago, have the contract for steam heating in the flat building of Lincoln Brooke, Wabash avenue and Thirty-sixth street.

SHAPLEY & WELLS, Binghamton, N. Y., have the contract for the ventilating plant for the Court House. Their bid was $1585.

THE CONTRACT for fitting the "Musgrove" Block, at Andover, Mass., for steam heat has been secured by C. S. Shepard of Lowell, Mass.

F. A. WENDELL, Salem, Mass., has been awarded the contract for plumbing the new 12-tenement house of Joseph Ladeau.

O. S. KENDALL & Co., Worcester, Mass., have been awarded the contract for furnishing the heating plants for the new farm building of the Worcester Lunatic Hospital and the new city engine house at Bloomingdale. In the first named will be set a William Allen & Son's boiler and in the second one made by the Stewart Boiler Works.

STOVE TRADE NOTES.

Ohio Stove Trade.

With one or two exceptions reports from manufacturers of stoves and ranges are discouraging. The foundries having trade with the South are especially blue; the low prices current for cotton and the freezing of the fruit in Florida are cited as among the features discouraging buying of goods by Southern dealers.

Some Northern manufacturers are still shut down, and as larger stocks than usual were carried over from last year, with no increase in the demand, such producers have nothing encouraging to offer. At the same time, while such manufacturers experience dull trade now, they certainly cherish hope for the future, as they are making preparations for opening new departments and otherwise expanding business, which would not be justified if there were not good reason for expecting an improvement during the coming season. For the present, however, while a few dealers and manufacturers are receiving liberal patronage for this time of year, the majority admit that trade is not developing as was expected after stock taking. Some producers even sound a note of warning that if wisdom is not exercised by manufacturers there is reason "to justify the belief that 1895 will be the worst year of all the poor years they have seen recently."

This state of affairs seems to be reflected in the condition of the market for pig iron, which is quiet and easy in tone, but there is some indication of more inquiry if not an increased volume of business in the near future. Money is abundant and accumulating in this section, seeking investment in local and Government securities at exceedingly high values, rather than employment in business enterprises.

The assembly of United States manufacturers in Cincinnati to consider the advisability of forming a national organization have already taken preliminary steps in the movement and at the moment of writing there seems no doubt but that the organization will be completed as was originally intended. This organization will secure united action, legislative and otherwise, for the common good of manufacturing industries throughout the country. Questions of national and international importance have been already and will be further considered and discussed. Energetic action will follow upon the interchange of views and permanent organization.

Cupola Tuyeres.*—III.

BY DR. EDWARD KIRK.

Chenney Tuyere.

The Chenney tuyere, designed by Mr. Chenney, a practical foundryman of Pittsburgh, Pa., now deceased, is a double tuyere very similar in arrangement to the Colliau & Whiting tuyeres, the only difference being that both the upper and lower rows point downward at a sharp angle to the lining.

The Double Tuyere.

The double or two rows of tuyeres appears to have first been designed and put into practical use about 1854 by Mr. Ireland, a practical English foundryman and cupola builder. In Ireland's cupolas, many of which were in use in England about that time, the tuyeres were placed in two rows about 18 inches apart. Those in the upper row were of only one-third the diameter of those in the lower row, and twice the number of tuyeres were placed in the upper row as were in the lower row. The slag hole was also used by Ireland in his cupolas, which were run for a great many hours without dumping or raking out, as was the custom in those days. These cupolas appear to have given very good results in long heats, but in short heats they were not so satisfactory, and in more recent patents obtained by Mr. Ireland the upper row of tuyeres was abandoned. The double tuyere was also used in Voisine's cupolas, another English cupola designer and constructor, and in Woodward's steam jet cupola, also an English cupola, many years before they were introduced into this country by Mr. Colliau about 1876.

It is claimed for the double tuyere that the second row consumes the gases which escape with the single tuyere, and, therefore, a great saving in fuel is effected in melting. That a more intense heat is created in the cupola at the melting zone by the double tuyere cannot be disputed, for the destruction of lining is much greater at this point than with the single tuyere; but, on the other hand, that any saving in fuel is effected has not been proven by comparative tests made in melting with the double tuyere cupola and the single tuyere cupola, when properly constructed and managed. On the contrary it has been proven that the single tuyere cupola is the most economical in fuel and lining. That the double tuyere melts iron faster than the single tuyere in cupolas of the same diameter is undisputed, and as between the single and double tuyere it is only a question whether the time saved in melting more than compensates for the extra expense of lining. When a double tuyere cupola is run to its full capacity the consumption of fuel per ton of iron is about the same as the single tuyere, but in small heats it is much greater. This is due to the large amount of fuel required for a bed, owing to the great hight of the upper tuyeres above the sand bottom, for the bed must be made about the same hight above the upper tuyeres as above the lower tuyeres in a single tuyere cupola, and no greater amount of iron can be charged on the bed with the double tuyere than with the single tuyere. When constructing or ordering a double tuyere cupola the smallest one that will do the work should be selected, so that the cupola may be run to its full capacity each heat and the best results obtained in melting.

Three Rows of Tuyeres.

A number of large cupolas have been constructed with three rows of tuyeres, for the purpose of doing faster melting than can be done with the single or double tuyere cupola. Probably one of the best melting cupolas of this kind in use at the present time is one constructed by Abendroth Bros., Port Chester, N. Y., to melt iron for stove plate, sinks, soil pipe and plumbers' fittings. This cupola is 60 inches diameter at the tuyeres and 72 inches at the charging door, and is supplied with blast from 36 tuyeres, placed in the cupola in three horizontal rows 10 inches apart, 12 tuyeres being in each row. The tuyeres in the first row are 6 inches square, those in the second row 4 inches square, and those in the third row 2 inches square. This cupola melts 60 tons of iron in four hours, which is probably the fastest melting done in this country for the same number of hours for light work requiring hot iron. In the double or triple tuyere cupola the upper tuyeres may be placed directly over a tuyere in the lower row, or they may be placed between the tuyeres of the lower row at a higher level. In Ireland's cupolas double the number of tuyeres were placed in the upper row as were in the lower row, so that one was placed directly over each tuyere in the lower row and one between. In the modern double tuyere cupola the same number of tuyeres are placed in each row, and the upper tuyeres are generally placed between those in the lower row. The object in placing these tuyeres in a cupola, as stated before, is to supply the oxygen to burn the unconsumed gases escaping from the combination of fuel at the lower tuyeres. If a proper amount of blast is admitted at the lower tuyere the cupola is filled with gases at this point, and it does not make any difference whether the upper tuyeres are placed over or between the lower ones, so long as the tuyeres are only to supply oxygen to consume the gases with which the cupola is filled. If this theory of producing heat by consuming the escaping gases from the combustion of fuel is correct, they can be consumed at any point in the cupola, and the row of tuyeres for this purpose should be placed above the bed, and the gas burned in the first charge of iron to heat it and prepare it for melting before it settles into the melting zone. To consume these gases only the tuyeres should be small, and the number of tuyeres in the upper rows should be two or three times greater than in the lower row so as to supply oxygen to all parts of the cupola, and not permit

* Copyrighted, 1894, by Edward Kirk.

the gases to escape unconsumed between the tuyeres. If the tuyeres in the second or third rows are made too large in proportion to the lower row, the supply of oxygen is too great for the combustion of the gases, and the effect is to cool the iron. In the modern double tuyere cupola this theory is not carried out, for the tuyeres in the second row are made big, and admit such a large volume of oxygen at one point that if they were placed high their effect would be to cool the iron rather than heat it. But they are placed low so as to force the blast into the bed and give a deeper melting zone, and their effect is to cause a more rapid combustion of fuel and do faster melting than is done in the single tuyere cupola of the same diameter.

Greiner Tuyere.

In Fig. 16 is seen the Greiner tuyere device. The novelty of this device consists in a judicious admission of blast into the upper zones of a cupola, whereby the combustible gases are consumed within the cupola and the heat utilized to preheat the descending charges, thereby effecting a saving in the fuel necessary to melt the iron when

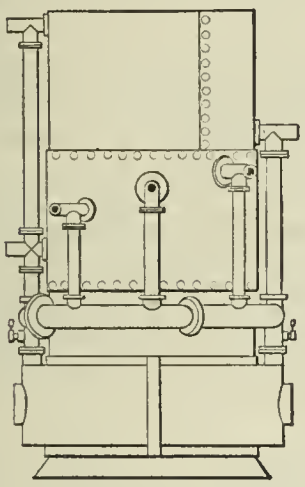


Fig. 16.—*Greiner Tuyere.*

it reaches the melting zone. This device consists of a number of upright gas pipes attached to the top of the wind box around the cupola, with branch pipes of 1 inch diameter extending into the cupola through the lining and about 1 foot apart, from a short distance above the melting zone to near the charging door. It is claimed that these small pipes admit a sufficient amount of oxygen to the cupola to burn the carbonic oxide produced by the carbonic acid formed at the tuyeres absorbing carbon from the fuel in its ascent. A great saving in fuel is thus effected by consuming this gas and preparing the iron for melting before it reaches the melting zone. A large number of cupolas with this device are in use in Europe and quite a number in this country.

Adjustable Tuyeres.

Tuyeres are sometimes placed in a cupola so they may be adjusted to conform with the size of the heat to be melted or the way the iron is to be drawn from the cupola, and thus save fuel in the bed. They are placed low when the heat is small or the iron is drawn from the cupola as fast as melted, and placed high when the heat is large or when iron is to be held in the cupola for a large piece of work. One of the best arranged cupolas of this kind I have seen is the cupola of the Pennsylvania Dismond Drill & Mfg. Company, Birdsboro, Pa. The air belt extending around the cupola is riveted to the shell about 4 feet from the bottom plate From this belt a cast iron air box bolted to the shell extends down nearly to the bottom plate in front of each tuyere. The front of this box has a sliding door extending full length of the box. The cupola shell has a slot in front of each box the full length of the box. On each side of this slot a piece of angle iron is riveted to the shell to hold the lining in place. The slot is filled in with fire brick, and a tuyere opening left at any desired hight from the bottom. When it is desired to lower the tuyere the brick are removed from the bottom of the tuyere and placed at the top, and held in place by a little stiff daubing or clay, and when it is desired to raise it the brick are removed from the top and placed at the bottom when making up the cupola. With the Colliau and Whiting style of air belt an adjustable tuyere can be arranged in this way at a very moderate cost, and foundrymen who think they must have their tuyeres placed high so they can make a large casting and only make such a casting once or twice a year, can save a great deal of fuel from the bed by having their tuyeres arranged in this way. The old plan of putting in two or three tuyere holes one above the other, and adjusting the tuyeres during the heat by raising the tuyere pipe from one to the other, is not practicable with the modern way of charging a cupola, and has long since been abandoned.

Lindemann's Folding Oven.

J. P. Lindemann & Sons of Milwaukee, Wis., have brought out a folding oven for oil, gas and vapor stoves, which possesses a number of interesting features. It is an original construction, on which they have applied for a patent. The oven is made in three solid sections, namely, the body, top and bottom, each complete in itself. These sections are entirely automatic in their action, requiring no hooks, screws, bolts or other separate parts to be used in putting the oven together. By inserting the top and bottom in their proper places, the oven is instantaneously ready for use. The body, to which is firmly attached the inside lining, is solidly and perfectly united by means of patent invisible hinges. This method of construction makes the body and linings one complete and solid section which folds in such a way that it nests solidly. Six ovens can thus be packed in a crate, making a compact package, taking a very low freight rate, and preventing damage to any parts of the oven or spoiling the ornamentation. Ovens shipped in this manner are reduced to one-fifth of the bulk of other ovens. The setting up or taking apart of an oven it so easy and simple that this feature can be made available at any time to save space, either for a dealer or consumer.

While all the qualifications for a perfect knock down or lay down oven are attained, yet none of the features of the flue arrangement of the standard Lindemann ovens have been sacrificed. The flues are constructed to distribute an evenly tempered heat into the oven, allowing the use of the upper and lower shelves at the same time. All the walls are utilized as flues, saving a large amount of heat. The bottom of the oven is supplied with a deflecting disk to prevent burning from below. The escape of the gases is in the top, so that the heat can there be utilized for warming plates, drawing tea, &c. This arrangement has been planned on scientific lines, which have been thoroughly tested by the manufacturers, and have proved very satisfactory in practical use, as shown by the steadily increasing trade which they enjoy. Six styles of folding ovens and nine styles of standard ovens are made, in both tin and Russia iron, to meet all possible requirements for portable ovens. The assortment now presented to the trade is much larger than that of last year. The firm are also large manufacturers of tinware, oil cans and sheet iron goods. They are the sole makers of Acme corrugated elbows, which are perfectly smooth on both sides.

The Troy Nickel Works

of Troy, N. Y., have just issued from the press an exceedingly attractive catalogue and price-list of Alaska stove trimmings which they manufacture in extensive variety. The volume is oblong in its general shape, profusely illustrated, neatly printed, and is bound in paper covers of rich design, stitched with a silken cord of a delicate shade of blue. The front cover is embellished with a design decidedly wintry, while the words "Troy Nickel Works, Manufacturers of Alaska Stove Trimmings, Troy, N. Y.," appear in prominent letters, but with an icy finish. The last page of the cover is embellished with a design somewhat similar in character to that on the front cover, but carrying representations of an Alaska stove lifter and poker, and the words "Always cold when in use." In the introduction we find a request to the effect that if by some unforeseen accident the catalogue falls into the hands of a person for whom it is obviously not intended, he is requested to hand it to the first hardware jobber or stove maker he meets and thereby receive the thanks of the Troy Nickel Works. The goods illustrated within the covers of this interesting volume include Alaska fire sets, shovels, stove lid lifters, pokers, kettle bail handles, tack hammers, stove knobs, turn keys, oven door handles, &c. Attention is also given to Alaska handles for drop oven doors for steel and wrought iron ranges and also to a full line of solid iron nickel plated stove trimmings, consisting of knobs, hinge pins, turn keys, foot rails, &c., on which special discounts will be made on application.

Marks on Fire Place Grates.

A correspondent writes us an interesting letter on the subject of fire place grates, in which attention is called to the fact that many makers of these goods omit to put any marks on them by which the ordering of repairs would be facilitated. He says:

There are many patterns of the most beautiful design in cast iron, but, strange to say, there are no marks on any parts of the grates by which one can identify the manufacturer in case the parts are destroyed or burned out. This is the cause of much perplexity and loss to the dealer. What are the manufacturers of grates thinking about? Suppose a stove founder should make a line of stoves and place them on the market without a name and number and omit the name of the makers, would not the dealer have a fine time furnishing repairs? That is just the situation with the grate question at the present time. A customer says: "Send a man to my house and put in a dump to my fire place grate." The workman goes to the place designated,

but finds no mark on the grate to tell him who makes it, nor is there any number on the grate. If the old dump is there we make a tracing of it and mail a copy to every manufacturer in the United States, with a view to ascertain who can furnish the necessary repair.

ODD PLATES.

THE LATEST NOVELTY of the advertising sort that the Gobeille Pattern Company, Cleveland, Ohio, are responsible for is a most deceptive imitation of a Western Union telegraph blank, and reads as follows: "Telegram received. Don't order any new patterns without writing us for drawings." Signed, "The Gobeille Pattern Company." While, as we say, the blank resembles the Western Union official blank, the printed matter on it all relates to the Gobeille Pattern Company, but it is distributed in such a way as to give the impression of the other form.

THE CO-OPERATIVE FOUNDRY COMPANY of Rochester, N. Y., have elected the following officers: Nicholas Brayer, president, and E. W. Peck, secretary and treasurer. These with John F. Brayer, S. R. Sill, Frank N. Brayer, Henry Cribben, W. F. Peck, F. J. Wahl and E. Detamble constitute the Board of Directors. The company have declared their twenty-seventh annual dividend, and have never passed one since their organization in 1867. The management has been in the same hands during this period. The treasurer's report showed a clean balance sheet, with no liabilities of any nature, and assets of nearly $500,000. After the meeting the usual festivities, which are an annual feature, were enjoyed by all present.

AT THE ANNUAL MEETING of the Superior Furnace Company, Little Falls, N. Y., the following officers for the ensuing year were elected: President, Watts Loomis; vice-president, Walter Whitman; directors, W. J. Millegan, Victor Adams, Charles Bailey, T. Dasey, W. T. Loomis and W. H. Switzer.

THE KERNAN FURNACE COMPANY of Utica, N. Y., have chosen the following officers for 1895: President, Francis Kernan; vice-president, William J. Owens; treasurer, Joseph F. Kernan; secretary, William H. Landers; directors, N. E. Kernan, Francis Kernan, Joseph F. Kernan, William H. Landers, William J. Owens and N. E. Devereux.

THE SCHUYLKILL VALLEY STOVE COMPANY of Spring City, Pa., resumed operations in all departments on Wednesday, January 23, giving employment to a large force.

AT THE ANNUAL MEETING of the stockholders of the Eclipse Stove Company, Mansfield, Ohio, the following Board of Directors were elected: J. H. Mering of Muncie, Ind.; W. A. Gorby of Marion, Ind.; H. M. Lewis, E. B. Tappen and W. J. Tappen. The Board of Directors then elected J. M. Mering president, W. A. Gorby vice-president, W. J. Tappen secretary and treasurer, Allen Blanchard superintendent and H. M. Lewis foreman of the foundry.

SAMUEL N. REEVES of the late firm of Reeves & Horner, Philadelphia, and George E. P. Smiley, who on November last commenced business as manufacturers' agents, under the firm name of Reeves & Smiley, have leased the premises 129 North Second street, Philadelphia, and will occupy them on or about February 1, representing the following manufacturers: Plymouth Foundry Company, ranges, boat stoves, oil stoves and heaters; Wisconsin Refrigerator Company. Peerless and Zenith refrigerators; Western Stove & Mfg. Company, gasoline stoves; Jas. R. Wotherspoon, Reeves Globe ovens for gasoline, gas and oil stoves, and Silver & Co., gas stoves, oil heaters, &c. They will carry a good stock in the lines they represent, in order to facilitate prompt shipment of orders.

IN REFERENCE to the calendar recently sent out by the Scranton Stove Works of Scranton, Pa., mention was made of a picture of three boys employed at a coal breaker shown in the background of the picture which embellished the card. A great many inquiries have been received by the company asking for an explanation of the picture, and they have replied to the effect that the photograph of the boys was taken just after they had left their work and as they were on their way home. The title given to the picture by the man who produced the engraving was "See 'em run." The boy in the center of the picture is a mule driver, who takes the coal by means of mule and mine car from the miner to the foot of the plane, where it is hoisted to the top of the breaker. The boy at the left is the one who opens and closes the door that distributes the air through the various chambers as the coal is taken out and the empty cars are received back into the chambers. This boy also looks after the switches. The boy on the right in the picture is a slate breaker, who sits at the chute and throws out the slate as the coal passes through the screens down into the cars.

WILLIAM P. WEATHERBY, a well-known and highly respected resident of New Castle, Pa., died recently in the eighty-second year of his age, having been a resident of that place for nearly 60 years. He learned his trade as a stove molder in the foundry of Hugh White, in Cincinnati, going from there to Pittsburgh, then in turn to Beaver, and thence to New Castle, Pa. He was employed as a boss molder in Cunningham's Stove Foundry at New Castle, Pa., for some 40 years. A local paper refers to him as an honest, upright man, beloved by all who knew him and a man who will be missed by a large circle of surving relatives and friends.

ARTICLES OF INCORPORATION were filed on the 11th inst. at Omaha, Neb., by the Cole Mfg. Company, with a capital stock of $100,000. The organization is for the purpose of carrying on the manufacture and sale of stoves and hardware specialties. A majority of the capital stock is to be held by H. A. Cole and E. C. Cole in consideration of the transfer by them to the company of all the machinery, patterns, &c., connected with their factory in the city named. The Board of Directors for the first year is composed of H. A. Cole, E. C. Cole and Arthur T. Cole.

EUGENE MUNSELL & Co. of 218 Water street, New York, will be represented during the year 1895 by the following salesmen, who will cover the territory named: George W. Graves will superintend the manufacture of the company's goods and at intervals visit the building trades in the Metropolis and adjacent cities, C. W. Yasinski and E. S. Coyne will look after the retail trade in New York City, Brooklyn, Jersey City and Newark; Charles E. Coleman will cover New York, Massachusetts and Western Connecticut, and William W. Swan will cover New Jersey, Connecticut and Long Island. The above mentioned salesmen are now visiting the trade in their respective sections.

BRIDGEFORD & Co. of Louisville, Ky., have just about completed new warehouses to replace those destroyed by fire in the latter part of 1893. With the additional machinery which the company have introduced, they expect to be in a far better position for promptly meeting the demand of their extensive trade than at any previous time in their history.

S. CHENEY & SON of Manlius, N. Y., have improved their facilities for fighting fire by putting in a number of additional hydrants.

THE GEORGIA STOVE WORKS of Atlanta, Ga., have about ready for the market a six hole range adapted for using coal and wood, and also a new wood and coal cook stove. These goods are very attractive in appearance, being substantially mounted and embodying the modern improvements. The makers expect for them a large and gratifying demand.

THE SYRACUSE STOVE WORKS of Syracuse, N. Y., have brought out a new single oven range for the season of 1895, it being offered in both portable and brick set form. The company have lately installed a sprinkler system throughout their plant, putting in a 500-gallon fire pump, and thereby securing a lower rate of insurance.

THE BLOOMINGTON STOVE COMPANY of Bloomington, Ill., are getting out a new line of 16 sizes and styles of cook stoves and ranges, and constructing a novelty in the shape of an all cast steel range, which is being offered in 18 styles and sizes. The makers feel that this steel range will prove very popular with the trade and meet with a large demand.

THE BRAND STOVE COMPANY of Milwaukee, Wis., are adding to their already extensive assortment of stoves and heaters a new line of cooks and ranges and a new line of furnaces.

CREA, GRAHAM & Co. of 155 Rebecca street, Allegheny, Pa., are bringing out a new line of natural gas ranges and gas heaters, embodying the latest improvements. They have improved and refitted a line of parlor stoves and added two sizes of a cottage parlor to their assortment.

THE CLEVELAND CO-OPERATIVE STOVE COMPANY of Cleveland, Ohio, are offering the trade this year three sizes of new heating stoves and intimate that they have under way a construction that will prove a decided surprise.

L. J. MUELLER FURNACE COMPANY, Milwaukee, Wis., are getting out the patterns for a line of furnaces which can be sold at a low price, and also propose to bring out a new soft coal heater.

THE NEW RANGE which the B. C. Bibb Stove Company of Baltimore, Md., have brought out under the name Tuxedo is made with right and left hand fire box and large oven. It is offered the trade in both portable form and brick set and embodies the latest improvements.

THE HOFFMAN RUSSELL COMPANY, 82 Lake street, Chicago, having discontinued contracting in the city. W. A. Bowron will assume this branch of the business and act as city sales agent for the Triumph furnaces.

THE FERROSTEEL COMPANY of 63 and 64 Wade Building, Cleveland,

Ohio, are about placing on the market some new sizes of their Ferrosteel ranges, which were very popular last year. The company report that their line of Ferrosteel registers is being well received at the hands of the trade.

SAM S. UTTER, 113 Beekman street, New York, received during the past week a number of gratifying orders from his agents in the West. We are advised that the sales of oil stoves thus far in the month of January were in excess of those of December or for the corresponding period of many previous years.

H. WATERMAN, 107 Beekman street, manager of the New York branch of the Cleveland Foundry Company, has recovered from an attack of the grip, which kept him from his desk for several days. We understand that the company which he represents have lately shipped to Japan and Corea a large order for oil stoves.

IN *The Metal Worker* January 19, in referring to two of the representatives of the Michigan Stove Company, the names were erroneously given through the changing of a letter. Their representative who will continue to visit the trade in New York and Pennsylvania is Frank P. McCanna and their representative in Southern Michigan is A. H. Dane.

HART & CROUSE of Utica, N. Y., have issued an exceedingly attractive catalogue of hot air furnaces for the season of 1895. The printing is upon good paper and the binding in paper covers of a delicate shade of pink, with side title consisting of the name and address of the company and an indication of the line of goods manufactured embossed in script letters. The opening pages are devoted to a chapter on furnace heating, in which mention is made of the company's Royal, Prince Royal, Victor and Imperial heaters, after which are presented illustrations of those goods, together with brief descriptive letterpress covering the styles, sizes and prices. Directions are given for setting brick set and portable furnaces, and numerous tables show the capacity of pipes, registers, &c.

AT THE ANNUAL MEETING of the Auburn Stove Foundry Company, held at Auburn, Maine, on the afternoon of Thursday, January 10, the following directors were elected: H. W. Hutchins, A. L. Goss, H. Fairfield, Dr. E. S. Coan, S. Record, George M. Briggs and George W. McFadden. After the meeting of the stockholders a directors' meeting was held at which the treasurer's report for the past year was examined and approved. The directors elected H. Wesley Hutchins president and T. H. Roberts treasurer for the ensuing year. It was decided to do away with the office of clerk, and hereafter the duties will be performed by the last named official.

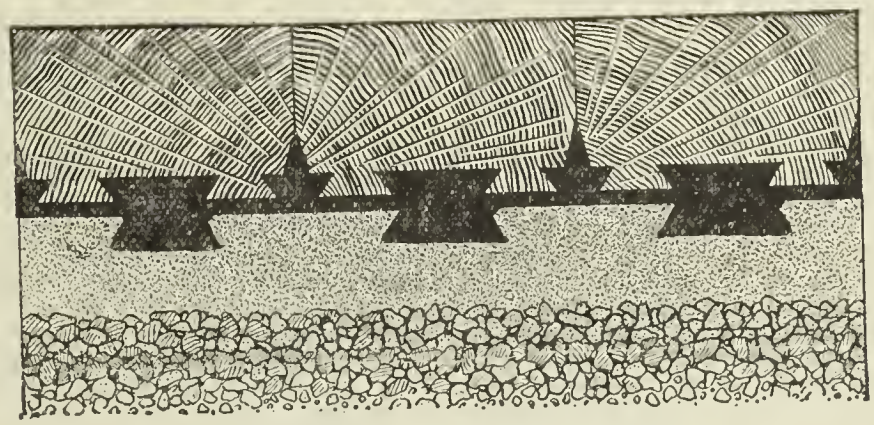
THE STOVE FOUNDRY of Floyd, Wells & Co., at Royersford, Pa., resumed operations on Wednesday of this week.

THE BUCKWALTER STOVE COMPANY'S foundry, Royersford, Pa., started up January 23 and will run three days a week.

THE MICHIGAN STOVE COMPANY, Detroit, Mich., have lately issued an interesting announcement relative to the scheme of advertising stoves and ranges by giving practical demonstrations of their merits in the shape of what they designate as "cooking carnivals." In connection with the announcement is a copy of a half page advertisement inserted in a local paper by the Lowell Hardware Company of Janesville, Wis., which is said to have produced results that warranted them in ordering from the company a full carload of Columbian-Garland steel ranges. This, the company state, goes to show the result of judicious advertising, and they trust their customers will profit by using the columns of local papers, always employing the Garland trade-mark, any size cut of which the company will furnish dealers free of charge. At the store of the Lowell Hardware Company a range was in full operation every afternoon and evening, at which time a free lunch of hot biscuits and coffee was served.

Wood-Block Flooring.

A form of flooring which after many years of trial has become popular in the chief countries of Europe has lately been introduced into the United States by James G. Wilson, well known manufacturer of rolling partitions, rolling steel shutters, Venetian blinds, &c., No. 74 West Twenty-third street, New York City. This flooring consists of wooden blocks about 18 inches long and from 2½ to 3 inches wide, varying in thickness from 1 to 1½ inches. The blocks are made from carefully selected lumber and are molded and cut by machinery designed especially for the purpose, thus insuring, when laid, a perfect fit and accurate joints. The block flooring is laid upon a cement foundation and secured to it by means of a bituminous compound which not only serves as a damp and vermin proof course, but also as a double dovetail key, binding the wood floor and the concrete foundation into a solid, immovable structure. The foundation for the floor may be of any fire proof material, such as brick, terra cotta tiles or coarse concrete. When this is dry, and a few days before the wood floor is to be laid, the top or finishing layer of Portland cement concrete, ranging from ¾-inch to 1½ inches in thickness, is floated on and brought to a dead level. While this is still plastic a multiple plow is run over the surface, cutting out parallel dovetail channels, which form an anchorage for the blocks. The surface thus prepared is permitted to dry, and when hard a hot bituminous compound is poured on, entering and filling the channels in the concrete and overflowing the surface to the required thickness. Into this hot compound the wood blocks are then pressed in such a way that every one is firmly anchored to its foundation. The illustration which is presented represents a section through the floor, showing first a course of rough concrete, then the cement upon which is the bituminous compound, and upon this in turn the wooden blocks of the flooring. This form of flooring is referred to by Mr. Wilson as being noiseless and warm, indestructible and impervious to dry rot, vermin, dirt, dampness and drafts. It is especially adapted for public and private buildings, and constitutes what is designated as an "ideal floor." The wooden blocks may be arranged in different ways, giving patterns of pleasing variety. Samples and estimates can be obtained on application to Mr. Wilson, at the address given.



Section through Wood-Block Flooring.

ARTICLES OF INCORPORATION have just been filed of the Jeffersonville Corrugating & Roofing Company. The capital stock is $10,000. President, P. C. Donovan; vice president, Thomas Fanning; secretary and treasurer, R. M. Martin. The latter, who for years has been manager of the Patton Mfg. Company, will have general charge of the corrugating works. His experience is large and the new company are assured of the best management. This company will manufacture all kinds of iron and steel roofing, but will pay most attention to corrugated and V-crimped roofing.

In spite of the depressed condition of business in 1894 the number of new textile mills established in the United States was very large, especially during the latter half of the year. The *American Wool and Cotton Reporter* places the number of new plants erected at 263, the Southern States making a particularly good showing. The record by States for the year is as follows: New York, 38; Pennsylvania, 36; North Carolina, 26; South Carolina, 23; Georgia, 19; Massachusetts, 15; Maine, 11; Virginia and Rhode Island, 8 each; Texas and Connecticut, 7 each, the remainder being divided among the other States.

An important development of the present gold exporting movement from New York was made public last week, namely, the purchase of large quantities of refined gold bars for export by foreign banking houses in place of gold coin. Receipts of refined gold at the United States assay office in Wall street have fallen off nine-tenths in volume in consequence of the metal having been purchased from the agents of the Western refineries by exporters, who are content to pay a premium of $1 for every $1000 in gold bars rather than ship gold coin, which is subject to loss by abrasion.

The steamer "Australia," which sailed from the port of San Francisco for Australia on Monday, carried as part of her cargo 2000 stands of arms and 75,000 rounds of ammunition for the Hawaiian Government.

TRADE REPORT.

The Iron Market.

Pig Iron.—Transactions on a large scale have been extremely few in the New York market. The same may be said of inquiries for round lots. There is, however, a very fair business in lots of moderate size, chiefly for prompt and near future delivery. In prices no changes of importance have taken place, but the market shows the same easy tone that has prevailed for some time past. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

Dull and heavy is about all that can be said in regard to the Philadelphia Pig Iron market. There is plenty of metal at the old prices, but as buyers are scarce and extremely cautious, it is difficult to place round lots without conceding something in their favor. It is one of the markets that cannot be quoted with exactness, as one may accept a price that another would hardly take into consideration, and, *per contra*, still another whose requirements are very stringent might pay a price that another would consider entirely too high. Then again there is the question of quantity, nearness of point of delivery, terms of payment and matters which easily make 50¢ @ 75¢ ℔ ton difference in a quotation without affecting actual values. Making all allowances for matters of this kind, however, the fact still remains that good buyers can do better than they could a month ago, due to fuller supplies and a greater pressure to secure orders. Holders claim that nothing could be had at less than our inside quotations, but as bids are not made for any but small or medium sized lots, it remains for the future to determine whether current quotations will be broken or not. Philadelphia and nearby deliveries are quoted as follows, and for some brands 20¢ @ 30¢ less at such points as Harrisburg, York, Baltimore, &c.:

Standard No. 1 Foundry X	$12.00 to $12.50
Standard No. 2 Foundry X	11.00 to 11.50
No. 2 Plain	10.75 to 11.00
No. 1 Soft	11.50 to 11.75
No. 2 Soft	10.75 to 11.00

The volume of business in the Chicago market has been somewhat better than that of the previous week, and yet trade was not particularly active. The largest contract reported was for 1000 tons of local Iron, and several others were for lots ranging from 200 to 500 tons. Some little business was done in Southern Iron, but Lake Superior Charcoal continued very quiet. Prices are firm on local Iron, but Southern appears to be inclined to weakness, evidently owing to the accumulation of stocks on furnace banks. Quotations are as follows, for cash:

Lake Superior Chareoal	$13.00 to $14.00
Loeal Coke Foundry, No. 1	10.25 to 10.50
Local Coke Foundry, No. 2	9.75 to 10.00
Loeal Coke Foundry, No. 3	9.50 to 9.75
Loeal Seoteh	10.50 to 11.00
Ohio Strong Softeners, No. 1	12.50 to 13.00
Southern Silvery, No. 1	11.50 to 11.75
Southern Silvery, No. 2	11.25 to 11.50
Southern Coke, No. 2	10.00 to 10.50
Southern Coke, No. 3	9.75 to 10.25
Southern, No. 1, Soft	10.00 to 10.50
Southern, No. 2, Soft	9.75 to 10.25
Alabama Car Wheel	17.50 to 18.00
Jaekson County Silvery	15.50 to 16.00
Other Ohio Silvery	14.25 to 14.50

Sales of Pig Iron in the Pittsburgh district have been small, and there is not much pressure on the part of furnaces to dispose of their product. The feeling prevails that Iron will bring better prices in the second quarter of the year, and the probability of slightly higher prices for Ore is having its effect. Quotations are given as follows:

No. 1 Foundry	$10.50 to $10.65, cash
No. 2 Foundry	10.00 to 10.25 "

Although no new phases have been developed in the local Iron situation at Cincinnati during the past week it is evident that a more hopeful tone prevails, if not an improved volume of business. Notwithstanding it is reported that Iron is accumulating in both North and South, the surplus is not sufficiently great to cause large producers to weaken; even smaller stacks are feeling more independent, although they are still disposed to accept an order of a desirable character even if it is necessary to shade the prices made by larger furnaces. Pipe works, which a short time since were melting heavily even to the extent of running double turns, are less busy now, but this is the usual experience at this season, while there is good reason to anticipate large purchases during the spring and summer months. Local commission men have experienced a fair sum of small orders during the week and at the close several large orders of moment are pending. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.00 to 9.25
Southern Coke, No. 3	8.50 to 8.75
Ohio Soft Stone Coal, No. 1	14.50 to 15.00
Ohio Soft Stone Coal, No. 2	14.00 to 14.50
Lake Superior Coke, No. 1	11.75 to 12.25
Lake Superior Coke, No. 2	10.75 to 11.50
Hanging Roek Chareoal, No. 1	16.00 to 16.50
Hanging Rock Chareoal, No. 2	15.50 to 16.00
Tennessee Chareoal, No. 1	13.00 to 13.50
Tennessee Charcoal, No. 2	12.00 to 12.50
Bessemer	11.65 to 12.00
Standard Southern Car Wheel	15.75 to 16.75
Lake Superior Car Wheel and Malleable	14.25 to 14.75

As regards the St. Louis Pig Iron market there is no improvement to note in the demand, although prices seem just a trifle more steady. There is still some low priced Iron being offered, but the major part of this Iron is either not up to the standard or else is made by a furnace whose reputation for quality is not the highest. Legitimate brands command the following prices: No. 1, Foundry, $10.25 @ $10 50; No. 2 Foundry, $9.75 @ $10. A few sales of No. 2 Foundry are reported, none of which will run over 400 tons. Aside from this the market is quiet but not weak. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.25 to $10.50
Southern Coke, No. 2 Foundry	9.75 to 10.00
Southern Coke, No 3 Foundry	9.25 to 9.50
Southern Car Wheel	16.25 to 16.75

Metal Market.

Pig Tin.—The reaction in prices mentioned last week was carried forward in the earlier days of this week, bringing wholesale prices up with a rush nearly ¼¢. Simultaneous with this rise was a sharp upward movement in London, and the deal had every appearance of having been engineered to squeeze operators who were short on January contracts, among whom were some of the bear leaders. After this squeeze, and a sudden falling off of buying orders, prices dropped almost as rapidly as they had previously advanced, and the market weakened. On Thursday, however, a further advance of nearly ¼¢ was recorded, and the market closed strong. A very fair jobbing business has been carried out, and quite a considerable amount of Tin has changed hands. Prices for small lots of Straits from store rule at about 15¢ ℔ lb.

Copper.—Dealings have been mostly of routine type, but to all accounts these involved a fairly liberal quantity of metal, chiefly for delivery during the next 30 days. Between the new business and consignments to Europe enough stock has been disposed of to give the market distinctly firm tone, and outside lots at a shade under the market that were about not long ago seem to have disappeared, for the time being at least. The smaller retail business doing is moderate in character, and prices for small parcels are unchanged at last week's quotations—namely, 15¢ ℔ lb.

Sheet Copper—Dealers report a fair run of orders and good inquiry for Cornice Copper, although the volume of actual business done is behind the average in amount. Improvement is, however, looked for as the year progresses, and a good business is anticipated by the spring.

Pig Lead.—Little change has taken place during the week. Demand keeps up well and the market retains very firm tone. The general situation is regarded as strong, and consumptive requirements, it is calculated, will keep the market so for some time to come. No change has been made in the ruling rates for small lots of American Pig from store, for which 3⅜¢ @ 3½¢ is quoted.

Spelter.—A slow market, with very flat undertone, is about all that there is to report. The buying has not improved in any particular, and the demand has been perfunctory in the extreme. In prices there is no change to note, although the market shows rather weak tone. Western in small quantities is quoted at 4¢ @ 4¼¢, according to brand. Fancy brands fetch the usual premium.

Antimony.—Dealings are of about the same volume and nature as for some time past. Prices in small lots do not vary much, remaining at about 8¢ for Hallett's and 9¼¢ for Cookson's.

Nickel.—The market is quiet, with prices at 35¢ @ 40¢, according to size of order.

Tin Plate.—Prices that proved attractive and continued reports of re-

duced production in Wales led to quite a good business in Plates for future delivery early in the week. Later the demand appeared to fall away again and relapsed into dullness. Small spot business has partaken of the general character that has marked it for some weeks past. In the aggregate, despite low prices, it has been considerably below the average of the season. The tame condition of the market in general has proved a considerable disappointment to those who looked for a revival in the demand for Plates this month. The market shows rather a soft tone, although prices remain nominally at the same level as last week.

A special London cable dispatch of January 23 to *The Iron Age* reports as follows in regard to the British Tin Plate market: In the Tin Plate market dullness is accentuated owing to weaker advices from New York and reports of restarting American mills. There is very little demand. Ordinary Bessemer Cokes sold at 9/3. Operators waiting. Many makers are refusing orders at current rates, preferring to shut down. Prices f.o.b. Wales are:

Bessemer Cokes, IC 14 x 20	@ 9/3
Siemens Cokes, IC 14 x 20	9/6 @ 9/9
Ternes, 20 x 28	18/6 @ 21/
Charcoals, IC 14 x 20	10/6 @ 12/6

Sheet Iron.—The general demand for Black Sheets continues only fair, and some of the mills are reported to be actively canvassing for orders. Galvanized sheets are in somewhat better demand than Black Sheets. Jobbers' quotations for small lots of No. 27 Common Iron from store are about 2 65¢; and Galvanized rules at 75 and 5 % @ 75 and 10 % off.

Chicago Report.

Scrap.—Trade is very light. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2¼¢
Rubber	....	4 ¢

Anthracite.—Business is extremely dull and prices are weak. Carload lots of 12 net tons or over are quoted as follows:

	Egg, Grate.	Sto. and Ch.
Chicago, Ill	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8.10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

CONDITION OF THE

Hardware Trade.

THE PAST WEEK has witnessed about the increase in the volume of business which is to be expected at this time. Travelers are beginning to be heard from and generally report prospects of a gradual improvement in trade. The tone of the market is unchanged and several lines of goods continue low and somewhat irregular in price, the tone of the market being rather weak and unsettled. The trade are purchasing in moderate quantities and buyers are watching the market closely to see the first indications of a reaction from the unprofitable prices at which many goods are selling. There is comparatively little complaint in regard to collections and the trade generally appear to be in good financial condition.

Advices from Chicago.—Jobbers of Shelf Hardware report that, while the business of the past week was only fair, orders the early part of the present week showed a marked improvement in number and size. The year has started out in very much better shape in every way than 1894. A peculiarity of the present trade is that the demand is running largely to miscellaneous goods. Excellent orders are being entered for spring goods to be shipped by the first of March, and all kinds of novelties in the house furnishing lines are moving freely; mechanics' tools are also in much better request than at any time last year, but in the matter of staple goods business is comparatively slow. This is ascribed, first, to the weakness recently developed in these lines, so that buyers are not yet assured that actual bottom has been reached, and, second, to the fact that the manufacturers are more largely than ever selling directly to the trade. Business in mixed carloads of Barb Wire and Wire Nails from factory is larger than usual. Another feature of the present trade is that buyers of Tinware and House Furnishing Goods, as well as general Hardware, are urging very prompt shipments, showing that stocks are light and that consumers are buying much more freely than for some time past. The outlook is regarded as very encouraging from the standpoint of Hardware jobbers.

Notes on Prices.

Wire Nails.—The volume of business during the past week has not been specially heavy, but the manufacturers report a good many inquiries, and some orders have been placed. The tone of the market is unchanged. Small lots from store in New York are quoted regularly at $1.15.

Advices from Chicago.—The movement of factory lots is reported by manufacturers as quite discouraging. They have had a lighter demand from the jobbing trade, which is evidently caused by the unsettlement of prices as reported last week. Jobbers themselves are experiencing quite a light demand. The quotation is now $1.05 for small quantities for direct shipment from factory, or $1.10 for shipment from stock in Chicago.

Cut Nails.—The condition of the Cut Nail market is not unlike that of Wire Nails. Prices are unchanged, small lots from store, New York, being quoted at 90 to 95 cents.

Advices from Chicago.—Manufacturers have had a quiet week. Orders have been light, but prices are unchanged, rates being still quoted $1 on small lots from stock.

Barb Wire.—The volume of business is not especially heavy and prices are unchanged. They are represented by the quotation of $1.85 for carload lots of Four-Point Galvanized at mill, but on large lots this figure is shaded and $1.80 given in some cases.

Advices from Chicago.—The factories in this vicinity are now all busy turning out stock for spring shipment. Business is quite good in the shipment of small lots from factory to the retail trade. Jobbers' quotations are $1.55 to $1.60, f.o.b. cars Joliet, for carloads of Painted and $1.90 to $1.95 for Galvanized, and $1.80 and $2.05, respectively, for small lots to be shipped from stock in Chicago.

Lanterns.—The following are the prices on the Tubular Mill and Crystal Lanterns described in our issues January 12 and 19, as put on the market by R. E. Dietz Company, 60 Laight street, New York.

	Per doz.
Tubular Mill Lanterns	$12.00
Crystal Lanterns	6.00

Eave Trough.—As noted last week, the list prices on Eave Trough were changed at a meeting of the United States Eave Trough and Conductor Pipe Association, held at Cincinnati, Ohio, on January 9. The full revised list, which will go into effect on February 1, 1895, is as follows:

No. 28 Gauge Galvanized Trough, Lap Joint.

	Per foot.
3 inch size, 6-inch girt	$0.13
3½ " 7 "	.14
4 " 8 "	.16
4½ " 9 "	.17
5 " 10 "	.19
6 " 12 "	.23
7 " 14 "	.27
8 " 16 "	.30

For heavier gauges than No. 28 add the following advances to No. 28 list. For No. 27, 1 cent; No. 26, 2 cents; No. 24, 6 cents; No. 22, 10 cents, and No. 20, 15 cents, all per foot.

Tin Eave Trough, Lap Joint.

	IC Terne. Per foot.	IX Terne. Per foot.
3 inch size, 6-inch girt	$0.08	$0.09
3½ " 7 "	.09	.10
4 " 8 "	.10	.11
4½ " 9 "	.11	.12
5 " 10 "	.12	.13
6 " 12 "	.14	.15
7 " 14 "	.16	.17
8 " 16 "	.19	.20

For Slip Joint Eave Trough add 1 cent per foot to the above lists of both Tin and Galvanized Lap Joint, and for Double Bead Trough add 3 cents per foot to the list prices for the same size and style, but Double Bead Trough must have 2 inches more girt than Single Bead of the same size.

The list prices on Roof, Quarter Circle, O G and Box Gutters were changed to the following:

No. 28 Gauge Galvanized.

Style A.

	Per foot.
14-inch girt	$0.35
20 "	.50
24 "	.60

Style B.

15-inch girt	.37
20 "	.50
24 "	.60

Style C.

12-inch girt	.30
14 "	.35
16 "	.40

Style D.

15-inch girt	.37
18 "	.45
20 "	.50

Style E.

15-inch girt	.37
18 "	.45
22 "	.55

Style F.

18-inch girt	.45
20 "	.50
22 "	.55

Style G.

18-inch girt	.45
20 "	.50
22 "	.55

Style H.

14-inch girt	.35
16 "	.40
18 "	.45

Style J.

18-inch girt	.54
20 "	.60
24 "	.72

The list prices on Round Ridging of No. 28 gauge, galvanized, were changed to the following:

				Per foot.
1¼-inch roll,	7-inch	girt		$0.14
1½ "	8 "	"		.16
2 "	10 "	"		.19
2½ "	12 "	"		.23
3 "	15 "	"		.28

The list prices on Angle Ridging of No. 28 gauge, galvanized, were changed to the following:

	Per foot.
3 inch apron	$0.13
3½ "	.14
4 "	.16

Old Metals.—There is a fair inquiry, but only moderate business as yet, most of which is at about the prices that have ruled for several weeks. The following quotations represent the current rates paid by dealers in this city:

Heavy Copper	℔ 7 ¢
Light and Tinned Copper	℔ 6½¢
Heavy Brass	℔ 4¾¢
Light Brass	℔ 3¾¢
Lead	℔ 2¾¢
Tea Lead	℔ 2½¢
Zinc	℔ 2⅛¢
No. 1 Pewter	℔ 10 ¢
No. 2 Pewter	℔ 5½¢
Wrought Scrap Iron, ℔ gross ton	$7.50 @ $8.00
Heavy Cast Scrap, ℔ gross ton	7.50 @ 8.50
Stove Plate Scrap, ℔ gross ton	5.00
Burnt Iron, ℔ gross ton	3.00

Old Rags, Paper, &c.—Demand is fair and dealers' purchasing prices substantially the same as those quoted last week, namely:

No. 1 White Rags	℔ 3 @ 3¼¢
No. 2 White Rags	℔ 2¼ @ 2½¢
Mixed Rags	℔ ¾ @ 1 ¢
Blues and 3ds	℔ 1⅛ @ 1⅜¢
Hard Sized White Shavings	℔ 2⅛ @ 2¼¢
No. 1 White Book Shavings	℔ 1¾ @ 2⅛¢
No. 2 White Book Shavings	℔ 1 @ 1⅜¢
Light Book Shavings	℔ ⅝¢
No. 1 Mixed Shavings	℔ ⅞ @ 1 ¢
No. 2 Mixed Shavings	℔ ⅝ @ ¾¢
No. 1 Printed Books	℔ 1 @ 1¼¢
Ordinary Mixed Books	℔ ½ @ ¾¢
Newspapers	℔ 2·5¢
No. 1 Manila Paper	℔ ¾ @ 1 ¢
No 2 Manila Paper	℔ ⅝ @ ¾¢
Bogus Paper	℔ 1½¢
Common Paper	℔ ¼ @ 3·5¢
Straw Chips	℔ ⅜¢
Binders' Clippings	℔ 1½¢
Jute Butts	℔ 1½ @ 1¾¢
No. 1 Jute Bagging	℔ 1 @ 1¼¢
Mixed Bagging	℔ ¾ @ 1 ¢
No. 2 Bagging	℔ ½ @ ¾¢
Hemp Twine	℔ 2 @ 2¼¢
Manila Rope	℔ 2 @ 2¼¢
Jute Rope	℔ 1½ @ 1¾¢
Mixed Rope	℔ ¾ @ ⅞¢

Old Rubber.—The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots, ℔	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory, ℔	@ .05¼
Rubber Shoes, less than carloads, ℔	@ .04¾
White Wringer Rolls, ℔	@ .03⅞
White Syringes, ℔	@ .03⅞

Trade Notes.

THE WEXLER METAL GOODS MFG. COMPANY of New York City have obtained letters of incorporation, with capital of $10,000 Directors, Judah Moses, J. Harris Balston, Arthur S. Ronald of Brooklyn and E. F. Kroyer of New York City.

THE LINDNER & REMIG MFG. COMPANY of New York have been chartered to manufacture machines wherewith to manufacture gas, electric, water, steam and other fittings and fixtures; capital, $100,000, and directors, Ernst Lindner of New York, Theo. H. Mulch of Mount Vernon and Philip W. Remig of Brooklyn.

THE CLONBROCK STEAM BOILER COMPANY were incorporated at Albany, N. Y., on January 17, to manufacture steam boilers and steam generators, steam fittings, smoke pipes, tanks, &c., in Brooklyn. The capital of the company is placed at $200,000, and the directors are Thomas F. Morrin of Jersey City, Thomas J. Lawler and John Harlin of New York City and M. B. Morrin of Brooklyn.

THE F. H. LAWSON COMPANY, Cincinnati, Ohio, Tin Plate and Metal dealers and manufacturers of Tinware and specialties, have made a large number of extensive improvements in the way of new machinery and modern appliances in the factory purchased by them from the late firm of Geo. D. Winchell Mfg. Company. They are now in possession of much better facilities for turning out goods in large quantities.

HAMILTON'S BEST REDIPPED AMERICAN ROOFING TIN, manufactured by John Hamilton, Pittsburgh, Pa., is being used on the roof of the new Post Office Building at Haverhill, Mass. The above brand of Roofing Tin has been on the market for some years, and has met with a constantly increasing demand, although sold at considerably higher prices than many other brands on the market. It has been used in roofing some of the largest Government buildings and school houses in the country and has given entire satisfaction wherever used.

THE NIAGARA STAMPING & TOOL COMPANY, Buffalo, N. Y., have just issued a small illustrated catalogue of some special machines and tools. The circular calls attention in the early pages to Squaring Sheals of various sorts; then come Circle Shears and Slitting Shears. The next division relates to Presses of many different kinds adapted for general and special purposes. These include heavy Power Presses and Foot Presses, and at the close reference is made to Crimpers, Seaming and Squeezing Machines. All the tools and machines are illustrated, and information is given, with price-lists and particulars of sizes and weights, &c.

CHAMPION STOVE CLAY for lining Stoves and Ranges and repairing Stove Linings is the subject of an announcement elsewhere in this issue by the Bridgeport Crucible Company, Bridgeport, Conn. Prices are quoted in bags for domestic use and in barrel lots for the trade.

CONTENTS.

Editorials:	PAGE
Convention of Heating Engineers	33
Gumption	33
Horse Sense	33
Future Tinners	33
The Letter Box—	
Brazing Cast Brass. Illustrated	34
Evans Hot Air Furnace	34
Will It Circulate? Illustrated	34
Flux for Soldering Zinc	34
Newark Parlor Stove	34
Boat Builders' Steam Box. Illus.	34
Railroads and Manufacturers	35
Steam and Hot Water—	
First Annual Convention of the American Society of Heating and Ventilating Engineers	36
Heating Notes	40
Determining Heating Power of Heating Systems	40
A Short Talk on the Construction of Hot Water Radiators	41
The Heating and Ventilating Engineer —A Commercial View	42
Polluted Well Water	43
Some Wonderful French Schemes	43
The Retail Store—	
Daisy Mincing Knives. Illustrated	44
Hot Blast Brazier's Furnace. Illus.	44
The Eclipse Lawn Sprinkler. Illus.	44
Memoranda	45
Philadelphia Lawn Sprinkler. Illus.	45
Plumbing and Gas Fitting—	
The Next Convention	46
Michigan Master Plumbers	46
The Puritan Bath. Illustrated	46
S. & G. Clamp and Testing Cover. Ill.	46
McDonald's Eureka Seat. Illustrated.	47
The Boston Safety Ball Cock. Illus.	47
Perfect Brass Pipe Hanger. Illus.	47
Zero Self Closing Stop and Waste Cock. Illustrated	48
Traps and Vents	48
Montreal Master Plumbers	49
News and Notes	49
Tin Plates—	
Tin Statistics for 1894	50
New Tin Plate Scale	50
British Tin Plate Exports in 1894	50
Scrap	50
Heating and Plumbing—New Work and Contracts	51
Stove Trade Notes—	
Ohio Stove Trade	52
Cupola Tuyeres.—III. Illustrated	52
Lindemann's Folding Oven	53
The Troy Nickel Works	53
Marks on Fire Place Grates	53
Odd Plates	54
Wood-Block Flooring. Illustrated	55
Trade Report—	
The Iron Market	56
Metal Market	56
Chicago Report	57
Condition of the Hardware Trade	57
Notes on Prices	57
Trade Notes	58
Metal and Miscellaneous Prices	59
Labor Exchange—	
Help Wanted	61
Situations Wanted	61

Metal and Miscellaneous Prices.

CHICAGO, JANUARY 24, 1895.

Tin—

Straits pigs.....16¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX, 14 x 20	@ 7.50
	IXX, 14 x 20	@ 8.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX, 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 26.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade.	IC, 10 x 14	@ 5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX, 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX, 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20, $4.75	@ 5.00
IC, 14x20, 90 lb.	4.25 @ 4.50
IC, 14x20, 100 lb.	4.50 @ 4.75
10 x 20	@ 7.25
20 x 28	@ 10.00
X, 10x14, 14x20	@ 6.25
U.V. Grade. IC, 10x14, 14x20	@ ....

Charcoal Plates.—Terne.

Guaranteed Plates command specia prices, according to quality.

Mansel and Dean Grades.—

IC, 14 x 20	@ $5.00
20 x 28	$9.50 @ 10.00
IX, 20 x 28	12.00 @ 12.50

Worcester Brand and equal.—

IC, 14 x 20	@ 5.25
IC, 20 x 28	10.00 @ 10.50
IX, 14 x 20	6.25 @ 6.50
20 x 28	12.50 @ 13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56	....	$12.50
XX, 14 x 56	$29.50	14.00
X, 14 x 60	....	13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.37½
IX, 10 x 14, 12 x 12, 14 x 20 6.62½

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.75
IX, 10 x 14, 12 x 12, 14 x 20. 7.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.25
IX, 10 x 14, 12 x 12, 14 x 20.. 8.00

Usual extras or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20 $5.75
IX, full weight, 14 x 20 7.50

Irondale A A:

IC, full weight, 14 x 20 5.25
IX, full weight, 14 x 20 6.75

Irondale A:

IC, full weight, 14 x 20 5.00

Irondale B:

IC, 100 lbs., 14 x 20 4.75
IC, full weight, 14 x 20 4.85

Irondale C, IC, 14 x 20, 100 lbs. 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates.—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $5.00
Old Hundred, IC, 14 x 20, 100 lbs. 4.75
R. W. & B., IC, 20 x 28, 216 lbs. 10.00
Old Hundred, IC, 20 x 28, 200 lbs. 9.50

Roofing Plates.

Palm, IC, 20 x 28	@ $10.00
Palm, IX, 20 x 28	@ 12.25
Empire, IC, 20 x 28	@ 10.75
Empire, IX, 20 x 28	@ ....
Hickory, IC, 20 x 28	@ 11.50
" IX, 20 x 28	@ 14.10
Alaska (heavily coated), IC, 20x28	@ 13.50
Alaska IX, 20 x 28	@ 16.70
Special, IC, 20 x 28	@ 13.50
" IX, 20 x 28	@ 16.50
Niagara, IC, 20 x 28	9.50
Iroquois, IC, 20 x 28	9.00

Westmoreland:

IC, 14 x 20 5.25
IC, 20 x 28 10.50

Kenwood:

IC, 20 x 28 10.00

Furmston:

IC, 14 x 20 4.75
IC, 20 x 28 9.50

Irondale AA, IC, 14 x 20 ....
Irondale A, IC, 20 x 28 10.50
Irondale B, IC, 20 x 28 10.10
Each extra cross $1.50.

Challenge, IC, 20 x 28 10.50

Juno:

IC, 14 x 20 ....
IC, 20 x 28 ....

Illinois, Old Method:

IC, 20 x 28 13.50
IX, 20 x 28 16.50

E. L.:

IC, 20 x 28 10.75
IX, 20 x 28 13.25

Jessie:

IC, 20 x 28 10.25

Old Process:

IC, 14 x 20 8.00
IX, 14 x 20 9.50
IC, 20 x 28 16.00
IX, 20 x 28 19.00

H. B. L., Old Style:

IC, 14 x 20 7.00
IX, 14 x 20 8.25
IC, 20 x 28 14.00
IX, 20 x 28 16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.65

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 1-10¢	2 3-10¢
17 to 20	₩ lb 2 2-10¢	2 9-10¢
21 to 24	₩ lb 2 3-10¢	3 ¢
25 and 26	₩ lb 2 4-10¢	3 1-10¢
27	₩ lb 2 5-10¢	3 2-10¢

Russia, Planished, &c.

Genuine Russia, all numbers ...13¢ net.
Patent Planished, ₩ lb A, 10.20¢; B, 9.20¢
dis. 10%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Junniata, or first quality.....dis. 75&10%

Copper—

Ingot.

Lake.....11 ¢ @ 11½¢
Casting Brands.....10 ¢ @ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅞ inch up to ¾ inch	.36
Plain, 1 inch up to ⅞ inch	.38
Plain, ⅞ inch up to 1 inch	.41
Plain, 5-16 inch up to ⅜ inch	.43
Plain, ½ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 lb casks.....$4.75
300 lb casks.....4.95
Loose sheets.....5.05

Solder—

½&½.....10½@11½¢
Extra Wiping.....9½@10½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9½¢

Lead—

Soft Pig Lead.....3½¢
Bar.....4¢
Pipe.....5½¢, dis. 10%
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe—

1¼ and under, Plain.....57½&10&10%
1¼ and under, Galv.....50&10&10%
1½ and over, Plain.....67½&10&10%
1½ and over, Galv.....57½%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.... 60%
Austin's Corrugated.....65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd.....65%
Ritchie's Spiral Lock Seam, Galv'd....60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....65%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....₩ lb, 2 ¢
" " Brown.....₩ lb, 1½¢
" " Purple.....₩ lb, 2½¢
" Ground in oil, B. Red ₩ lb, 6½¢
" Ground in oil, Red.. ₩ lb, 6½¢
" Ground in oil, Brown ₩ lb, 5½¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls.....60¢
Linseed Oil, Raw, in bbls.....58¢
Mineral Paints.....2@4¢
Orange Mineral.....8¢
Pure White Lead in Oil.....5½@5½¢
Dry White Lead in bbls.....4½@5½¢
Red Lead, American.....5½@5¾¢
Red Venetian, English, dry .....1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢
kegs.....7½¢
Sipe's Japan Oil, in bbls, ₩ gal..... 84¢
Spirits Turpentine, in bbls., ₩ gal. 35½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.50
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.15
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.50
Roofing Pitch, lb bbl. of 300 lb.....$3.00

NEW YORK, JANUARY 25, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots

Small lots	₩ lb, 63¢
100-lb lots	₩ lb, 60¢
Ton lots	₩ lb, 58¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	₩ lb, 60¢
100-lb lots	₩ lb, 55¢
Ton lots	₩ lb, 53¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	₩ lb, 55¢
100-lb lots	₩ lb, 53¢
Ton lots	₩ lb, 50¢

Antimony—

Cookson.....₩ lb, 9½@10½¢
Hallett's.....₩ lb, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.	
¼-in. up to 2-in.	$0.35	30%
⅛-in. up to ¾-in.	.36	
⅛-in. up to ⅞-in.	.38	
⅛-in. up to ½-in.	.41	
5-16-in. up to ⅜-in.	.48	
¼-in. up to 5-16-in.	.65	@
3-16-in. up to ¼-in.	1.00	25
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
⅜ in. and larger	Special	
⅜ in. to 3 in., to No. 16, inclusive,	.38	

Cooper and Bronze Tubing—

50¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized.....60&10%
Galvanized, Locked Joints.....60&10%
Tin.....60&10%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₩ lb, net
Ingot.

Lake	10½¢
Ansonia Grade Arisona	10½¢
Ansonia Grade Casting	9½¢
Planished	net
Sheet and Bolt	15¢ ₩ lb, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:

Lap or Slip Joint, Galvanized.....70&5%
Lap or Slip Joint, Terne.....60&5%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....80%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb 2.25	2.60¢
Nos. 17 to 21	₩ lb. 2.35	2.70¢
Nos. 22 to 24	₩ lb, 2.45	2.80¢
Nos. 25 and 26	₩ lb. 2.55	2.90¢
No. 27	₩ lb. 2.65	3.00¢
No. 28	₩ lb, 2.75	3.10¢
American B. B.	₩ lb,	4¢@4¼¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11@11½¢
Patent Planished ...₩ lb, A, 10¢; B, 9¢. 5%
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		75&5@75& 10% off.
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig.....3½@3¼¢
Bar.....4@4½¢
Pipe.....5¼¢ 20%
Tin Lined Pipe.....12½¢ 20%
Block Tin Pipe.....30¢ 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 8.

Lathing.....10%
Fencing, Painted Sheets.....30%
Netting, Painted Sheets.....30%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100 @ 500 lb.....5¾
Lead, Amn. White, in oil.....@ 5½
Lead, Red, bbls. and ½ bbls.....@ 5¾
Lead, Red, kegs.....@ 6¾
Ocher, American.....@ 1½
Red Venetian, American.....@ 1¾
Linseed Oil:
Raw, ₩ gal.....@ .56
Boiled.....@ .59
Spirits Turpentine:
In bbls.....@ .30
Putty:
In barrels and ½ bbls.....01¾ @ .01¾
In tubs.....01¾ @ .01¾
In tin cans.....01¾ @ .02¼
In bladders.....01¾ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ lb..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch ₩ bbl.....$2.25

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe, " " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—
Galvanized....60%
Tin....60%

Rock and Slag Wool—
	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	48½¢

Rosin—
Common and Good—Strained
Rosin, C. & D....₩ bbl. $1.43@$1.45
Rosin, E. & F....₩ bbl. $1.50@$1.57½
Rosin, G. & H....₩ bbl. $1.65@$2.00
Rosin, I. & K....₩ bbl $2.30@$2 70
Rosin, M. & N....₩ bbl $2.95@$3.10

Seamless Brass Tubes..net
List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—
According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr....$3.25@$4.50
Pen Argyle, ₩ sqr....8.70@ 4.00
Peach Bottom, ₩ sqr....4.75@ 5.60
No. 1 Chapman, ₩ sqr....8.90@ 4.25
Lehigh Slates, ₩ sqr....8.00@ 4.50
Vermont:
Sea Green, ₩ sqr....2.50@ 2.75
Purple, ₩ sqr....8.50@ 4.50
Unfading Green, ₩ sqr....8.50@ 4.00
Red, ₩ sqr....9.75@12.00

Solder and Soldering Fluids—
Solder—
½&½, guaranteed....11¢
No. 1....9@9½¢
Prices of Solder indicated by private rands vary according to composition.

Soldering Fluids—
Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ lb....4¢
Smaller quantities, ₩ lb....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 lb, ₩ lb....3½¢
½ bbls., about 300 lb, ₩ lb....4¢
Kegs, about 110 lb, ₩ lb....4¢
75¢ extra for keg.
Kegs, about 55 lb, ₩ lb....4¢
} 5 x qts.

Yager's Soldering Salts.
½-lb bottles, each....30¢
Large quantities, per lb....40¢

Spelter—
Western Spelter....4¢@4¼¢
Bertha (pnre)....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers. Conductor—
Galvanized....60%

Tin, Pigs and Bars—
Banca, pigs, ₩ lb....16¢
Straits, pigs, ₩ lb....15¢
Straits in bars, ₩ lb....16¢

Tin Plates—
American Terne Plates—
Alaska (re-squared) IC, 14 x 20....$6.50
Alderly, extra quality, IC, 14 x 20..5.37½
Allegheny, IC, 14 x 20....4.50
" IX, 14 x 20....5 75
Anchor IC, 14 x 20....4.12½
Apollo Roofing, IC, 14 x 20....5.50
" " IX, 14 x 20....6.50
Black Diamond (Extra Coated), IC, 14 x 20....7.50
Bonus (Extra Coated), IC, 20 x 28..11.50
" " IX, 20 x 28..14.50
Boston, IC, 14 x 20....6.25
Brooklyn, IC, 14 x 20....4.50
Capitol, IC, 14 x 20....4.25
Central, IC, 14 x 20....4.75
Climax, IC, 14 x 20....4.37½
Columbia, IC, 14 x 20....6 25
Columbus, IC, 14 x 20....4.75
Dunlap's Double Dipped, IC, 14 x 20 7.50
" " " IX, 14 x 20 8.75
" Domestic, IC, 20 x 28....10.00
Empire, IC, 14 x 20....5.12½
Eureka, IC, 20 x 28....9.50
" IX, 20 x 28....12.00
Eureka, 200 lbs., IC, 20 x 28....9.20
Excelsior, IC, 14 x 20....4.75
Filbert, IC, 14 x 20....7.25
Flag, IC, 14 x 20....4.00
Florida, IC, 14 x 20....4.75
Flushing, IC, 14 x 20....6 25
Freeport (Hand dipped and Resquared). IC, 14 x 20....6.50
IX, 14 x 20....7.75
Globe, IC, 14 x 20....4.50
Golden Star Old Style, IC, 20 x 28...15.00
" " " " IX, 20 x 28...18.00
Grace, IC, 14 x 20....4.25
Hamilton's Best Redipped, IC, 14x20 7.75
" " " IX, 14x20 9.25
Hickory (Resqnared), IC, 14 x 20....5.50
J. L. O., IC, 20 x 28....9.25
Juniati, IC, 20 x 28....11.50
Juno, IC, 14 x 20....5 50
Kensington, IC, 14 x 20....6.75
" IX, 14 x 20....8.00
Knoxall, IC, 14 x 20....4.75
Laufman's Apollo (Resquared), IC, 14 x 20....6.75
Laufman's Apollo (Resquared), IX, 14 x 20....8.25
Leominster, Extra Coated, IC, 14x20...5.75
Lion (Stamped), IC, 14 x 20....5.75
Lulu, IC, 20 x 28....10.50
" IX, 20 x 28....13.50
Maple, IC, 14 x 20....5.75
Merchant's Roofing (Resquared). IC, 14 x 20....7.50
Meurer Roofing, IC, 14 x 20....7.75
National, IC, 14 x 20....5.50
Nava, IC, 20 x 28....10.00
" IX, 20 x 28....12.50
New Castle Old Method, IC, 20x28, 18.00
New Castle Palm, IC, 20x28....14.50
Old Colony, IC, 14 x 20....7.50
Osborn's Old Process, IC, 20 x 28....14.00
" " " IX, 20 x 28....17.00
Osceola, Old Style, IC, 14 x 20....7.25
" " IX, 14 x 20....8.75
Pennsyl Old Method (Trebie Coated), IC, 14 x 20....7.00
Phillips' Roofing, IC, 14 x 20....7.00
Phœnix, IC, 14 x 20....4.62½
Pullman, IC, 14 x 20....5.75
Republic, IC. 14 x 20....4.75
Scott's Extra Coated (Resqnared), IC, 14 x 20....8.00
Scott's Extra Coated (Resqnared), IX, 14 x 20....9.50
Standard. IC, 14 x 20....4.15
Star, IC, 20 x 28....10.50
" IX, 20 x 28....13.00
Superior, IC, 14 x 20....4.50
Taylor's Old Method, IC, 14 x 50....6.50
Taylor Old Style (Resquared), IC, 14 x 20....7.50
Taylor Roofing, IC, 14 x 20....6.75
The Osborn Roofing, IC, 20 x 28....11.50
" " " IX, 20 x 28....14.00
Thomson's Puritan, IC, 14 x 20....5.50
Tip Top, IC (Resquared), 14 x 20....4.88
" IX " 14 x 20....6.13
Triumph, Old Style, IC, 14 x 20....7.50
" " IX, 14 x 20....9.00
U. S. Monongahela, IC, 14 x 20....6.10
U. S. Redipped, IC, 14 x 20....8.25
Venus, IC, 14 x 20....4.12½
Waldo, IC, 14 x 20....5.75
Westmoreland, IC, 14 x 20....6.25
Willow, IC, 14 x 20....5.25
Zero, IC, 14 x 20....4.50

American Bright Plates—
Almond, IC, 14 x 20....$5.25
Brilliant (Tissue Packed), IC, 14x20. 8.00
Brooklyn, IC, 14 x 20....5.50
Century, IC, 14 x 20....5.00
Climax, IC, 14 x 20....4.75
Excelsior, IC, 14 x 20....6.50
" IX, 14 x 20....7.50
Florence, IC, 14x20....5.50
Florida, IC, 14 x 20....5.75
" IX, 14 x 20....7.00
Gladys, IC, 14 x 20....4.50
Hazel, IC, 14x20....5.80
Ivy, IC, 20 x 28....12.00
" IX, 20 x 28....15.00
Linden. IC, 14x20....5 50
Mars, IC, 14 x 20....4.50
" IX, 14 x 20....5.50
Merchant's Dipped, IC, 14x20....10.00
Merion, IC, 14x20....6.00
Mint, IC, 14x20....5.00
New Castle Best Palm Charcoal, IC, 14 x 20....7.00
" " IX, 14 x 20....9.00
New Castle Palm Charcoal, IC, 14 x 20....6.50
" " IX, 14 x 20....8.00
New Castle, Charcoal, IC, 14 x 20....6 25
" " IX, 14 x 20....7.50
New Castle, S. Charcoal, IC, 14 x 20. 6.00
" " IX, 14 x 20. 7.25
New Castle Palm Coke, IC, 14 x 20..5.75
" " IX, 14 x 20..6.85
New Castle Coke, IC, 14 x 20....5.50
" " IX, 14 x 20....6.50
Oak, IC, 14 x 20....4.75
Palma, IC, 14x20....6.00
Pansy, IC, 20 x 28....10.50
" IX, 20 x 28....13.00
Phœnix, IC, 14x20....5.25
" IX, 14x20....6.50
Royal, IC, 14x20....6.25
U. S., IC, 14x20....7.25
Versailles, IC, 14 x 20....5.75
Walnut, IC, 14 x 20....4.65
Youghiogheny, IC, 14 x 20....6.00

Imported Terne Plates—
Charcoal.
MF Grade, IC, 14 x 20....$6 2
20 x 28....12.5
Pontymister Old Style Grade, IC, 14 x 20....5.50
20 x 28....11.00
IX, 14 x 20....6.50
20 x 28....13.00
Worcester Grade, IC, 14 x 20....4.50
20 x 28....9.00
IX, 14 x 20....5 75
20 x 28....11.50
Dean Grade.—IC, 14 x 20....4.25
20 x 28....8.50
IX, 14 x 20....5.50
20 x 28....11.00
Abercarne Grade.—IC, 14 x 20....4.00
20 x 28....8.00
IX, 14 x 20....5.50
20 x 28....11.00
Mansel Grade, IC, 20 x 28....8.00

Imported Bright Plates—
Charcoal.
Duty: 2.2¢ ₩ lb.
Melyn and Calland Grade. IC, 10 x 14....$5.25
" " IC, 12 x 12....5.50
" " IC, 14 x 20....5.25
" " IC, 20 x 28....10.50
" " IX, 10 x 14....6.50
" " IX, 12 x 12....7.00
" " IX, 14 x 20....6.50
" " IX, 20 x 28....13.00
" " DC, 12½ x 17....5.00
" " DX, 12½ x 17....6.50
Allaway Grade. IC, 10 x 14....4.75
" " IC, 12 x 12....5 00
" " IC, 14 x 20....4 75
" " IC, 20 x 28....9.50
" " IX, 10 x 14....5.50
" " IX, 12 x 12....5.75
" " IX, 14 x 20....5.50
" " IX, 20 x 28....1.00
" " DC, 12½ x 17....4.25
" " DX, 12½ x 17....5.00

Coke.
Steel Coke.—IC, 10x14, 14x20....4.25
10x20....6.50
20x28....8.50
IX, 10x14, 14x20....5.25
B. V. Grade.—IC, 10x14, 14x20....4.25

Imported Boiler Plates.—
IXX, 14x26..(112 sheets)....$11.50
IXX, 14x28..(112 sheets)....11.90
IXX, 14x31..(112 sheets)....13.25

Tinning—
Brass and Copper.....

Tubing—
Tin....55%
Galvanized....55%

Brass and Copper.—
Standard List....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—
Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz....18.00
Daisy Improved Pattern, ₩ doz....18.00

Wrought Iron Pipe—
1¼ and under, Plain....60&10&5%
1¼ and under, Galv....50&10&5%
1½ and over, Plain....70&10&5%
1½ and over, Galv....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892....52½%
Inserted Joints Casing, list Nov. 16, 1892....47½%
Steel Boiler Tubes....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—
600 lb casks....₩ lb 4¾¢
Per lb....5¼¢

It Is Reported—

California.

That George M. Cooley, Hardware merchant, of San Bernardino, has leased his store for two years to his brother, Frank L. Cooley, and Frank Keller, who have been connected with the house for the past eight years. Mr. Cooley will take a much needed rest to regain his health, and will go to Yuma until spring, spending the summer in Colorado. Frederick Cooley will open a branch store at Colton in about two months.

Colorado.

Andrus Bros., Hardware merchants, Pueblo, have removed to new and more commodious quarters.

That E. B. Bonnell of Claremont, S. D., will remove to Grand Junction, where he will continue business.

Connecticut.

That the firm of White & Porter, Stove dealers, Bristol, have been dissolved by mutual consent.

Georgia.

That in a large fire at Macon on the 18th inst. the building of the Dunlap Hardware Company was destroyed. The loss is estimated at $60,000; insurance, $25,000.

Illinois.

That Woodward & O'Brien are a new Hardware firm at Shipman.

That Houck & Holton, Colchester, have taken possession of their new Hardware store.

That W. R. Bottenfield of Sullivan, Ind., has purchased a Hardware store at Oblong.

Indiana.

That J. A. Hunter, Elwood, will remove his Hardware business to a new building about February 1.

That Samuel Sims of Russiaville is contemplating entering the Hardware business at Forest.

Iowa.

That Benjamin Weber is about to start in the Hardware business at Dubuque.

That Mr. Dillin has retired from the Hardware firm of Wheeler & Dillin, Nola. The business will hereafter be conducted under the style of Wheeler Bros.

That W. J. Gustin is successor to A. Long in the Hardware business at Knowlton.

Kansas.

That as J. J. Van Wick started to close his Hardware Store at Kansas City on the night of the 15th inst., two highwaymen leveled revolvers at him and commanded him to walk back into the store. The robbers tied him in a chair and commenced a search for money. Mr. Van Wick was compelled to open the safe, but it was empty. The highwaymen grew angry and flourished their revolvers in the face of their prisoner, and told him that he must either tell where the money was or get ready to die. Fearing that his captors would execute their threats, he opened a keg of nails and turned out $100 in cash, a lot of checks and some county scrip. After securing the money the robbers took the keys of the store and walked out of the front door and locked their prisoner in. Mr. Van Wick finally untied himself and reported the matter to the police.

Kentucky.

That the Hardware firm of Barkley & Holloway, Jessamine, have dissolved partnership. S. E. Holloway has purchased the interest of James F. Barkley. Mr. Barkley will make a trip to Mexico.

Michigan.

That the Carlton Hardware Company of Red Jacket have bought out the Hardware stock of Gilbert & Lang, Houghton, and placed Edward T. Emmons in charge.

Minnesota.

That H. B. Gray of Hastings, Iowa, has become associated with H. B. Gardner in the Hardware and Stove business at Minneapolis.

That Fenger, Wegener & Alton have succeeded Fenger, Wegener & White in the Hardware business at Alexandria.

That A. H. Pew has purchased the Hardware stock of G. S. Greer & Co. at Graceville.

That I. E. Sorlie will build a new Hardware store at Hartland.

That Carl Luhmann has sold out his Hardware stock at Howard Lake.

That Buell & Offenlock are a new partnership in the Hardware business at Kasota.

That J. P. Watson, Marshall, has taken his son John L. Watson into partnership with him in the Hardware business. The style will hereafter be J. P. Watson & Son. Mr. Watson has been 42 years in the Hardware business, 22 years of which as proprietor.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

Gentleman thoroughly familiar with retail stove, range and house furnishing goods business to assume the management of an extensive establishment in a prominent Southern city. Henry Smith, office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. Jan. 26

A practical FURNACEMAN; one who can put up a furnace to heat and estimate on work; also a practical PLUMBER; one who can do a first-class sanitary job and estimate on same. "P.," No. 126, office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

A first-class FOUNDRY FOREMAN who thoroughly understands all kinds of core work, also the mixing and melting of iron to best possible advantage, and has had experience in handling large number of men. "Core Work," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

Non-union STOVE PLATE MOLDERS. A. T. Nye & Son, Marietta, Ohio. Jan. 26

A first-class SUPERINTENDENT for a tinware and tin can factory; must be fully posted on machinery and a practical man; a good opening for the right party. "E. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

A PLUMBER and STEAM FITTER with some knowledge of tinning, to work in country town with water system; give age, experience and wages wanted. "J. W. D.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

A first-class TINSMITH who understands general country work, plumbing and furnaces; a steady year around job for right man; do not apply unless you are competent and temperate. Burchard Bros., Oxford, N. Y. Jan. 26

A bright young man of good address and experience to call on architects and the trade in New York and vicinity for a well-known furnace, forge and steam and hot water house; a good opportunity for the right man. "X. Z.," No. 126, office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

SALESMAN, acqualnted with retail house furnishing and stove trade in New York City and suburbs to sell refrigerators and specialties on commission. P. O. Box 77, Stapleton, S. I., N. Y. Jan. 26

Two first-class PATTERN MAKERS who are thoroughly conversant with stove work; none but experienced and capable men need apply. D. H. Natlon, foreman pattern department, Excelsior Mfg. Company, 1440 North Main street, St. Louis, Mo. Jan. 26

First-class TRAVELING SALESMAN thoroughly familiar with steel ranges and hotel kitchen outfitting; only experienced men well recommended need apply. "Hotel Kitchen," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

Three good CORNICE WORKERS and one good TINSMITH who can do all inside and outside work; only first-class men need to apply at the West Hoboken Galvanized Iron, Cornice & Skylight Works, 610-614 Spring street, opposite DuBois street, West Hoboken, N. J. Jan. 26

A man who thoroughly understands CORNICE WORK and getting out galvanized iron fronts; must be capable of cutting patterns from drawings and superintending construction and putting up work; only a first-class man need apply. P. O. Box No. 3, Jersey City, N. J. Jan. 19

A practical TINNER, one who understands general country jobbing, with a fair knowledge of plumbing, steam pipe and furnace work; must be strictly temperate and reliable; a steady job to the right man; state age, weight, experience, married or single, and wages expected. Box 80, Warren, Mass. Jan. 19

A good live TRAVELING AGENT to take our specialties as a side line on a commission. Zero Valve Company, 212 Seneca street, Buffalo, N. Y. Jan. 19

A CORNICE MAN, who can estimate and work from architects' drawings; one who thoroughly understands cornice work in all its details. "A. B. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 19

A good TINSMITH for country tin shop; one who has some knowledge of steam heating and furnace work; must be steady and sober; married man preferred. Box 128, Townsend, Mass. Jan. 19

SITUATIONS WANTED.

An experienced TRAVELER, who has represented for a number of years some of the best stove foundries, would like to make an engagement to travel in New York, Pennsylvania, Ohio, New England or the South, where he has an acquaintance and trade. "S.," Box 126, Wickford, R. I. Jan. 26

By a first-class PLUMBER; best of references; city or country. Robt. Smith, 947 Third avenue, New York City. Jan. 26

By a first-class CORNICE and SKYLIGHT PATTERN CUTTER; can estimate from architects' plans. "C. S." office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

As SALESMAN in Michigan or Ohio for stoves and ranges or tinware, by a hustler. "Michigan," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

By a first-class TIN, COPPER, BRASS and SHEET IRON WORKER; able to take charge of all kinds of general jobbing work; steady job desired in city or country; sober. B. Maurer, 63 Lewis street, New York City. Jan. 26

By a first-class PLUMBER, STEAM, HOT WATER and FURNACE MECHANIC who is also a tin and sheet iron worker; understands every detail of these branches; sober and reliable man; good reference. Box 13, 561 Broadway, Brooklyn, E. D., N. Y. Jan. 26

PLUMBER, strictly first-class mechanic, desires work in city or country; 18 years at trade; neat lead worker; understands plans; can furnish best references as to habits. J. Usher, 434 East 114th street, New York City. Jan. 26

By HELPER, who has worked a year and a half in a plumbing and tin shop; 24 years of age; strong and steady, and can wipe good joint and make elbows for stove pipes. Ed. McCaffrey, 17 Pulsifer street, Auburn, Maine. Jan. 26

By a first-class CORNICE and SKYLIGHT MAKER, CUTTER and DRAFTSMAN; understands estimating from plans; can take charge of any number of men and handle to best advantage; New York or Brooklyn preferred. "F. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

By a man 33 years of age, who has had 17 years' experience at pieced tinware, roofing, spouting, piping, pump and furnace work; understand handling stoves and ranges; best of references; country town in Massachusetts preferred. Box 587, North Brookfield, Mass. Jan. 26

By a PLUMBER, who is also a good tinsmith, steam and hot water heater fitter. "Plumber," 414 Colchester avenue, Burlington, Vt. Jan. 26

SALESMAN wants a good line to handle in Wisconsin; now employed with large Chicago firm; best of references; will work on a guarantee of $50 a month. "Wisconsin," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

As FOREMAN of tin shop, by practical man; 30 years of age; can do all kinds of work—furnace, blower, range, pipe and pump work; can estimate from plans and handle men and boys. Box 695, Wellsboro, Tioga County Pa. Jan. 26

A first-class MECHANIC, on skylight and corrugated iron work wants a steady job in any section. "W. J. B.," 1813 South Hicks street, Philadelphia, Pa. Jan. 26

By a STOVE SALESMAN, to travel for a good house; established trade in Pennsylvania, New Jersey and Delaware; also well conversant with gas and gasoline stove business. "Experience," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Jan. 26

A young man of 17 having some office experience desires a situation where he can advance himself. Can furnish excellent references and is willing to work for a reasonable salary. Alex. McKee, 21 Prescott Place, Jersey City, N. J. Jan. 26

Steady position desired by a first-class PLUMBER accustomed to tin and sheet iron work, steam and hot water fitting; 32 years of age; 14 years' experience. "Plumber and Tinner," 187 Main street, Danbury, Conn. Jan. 26

By March 1 or sooner, as TINNER and HARDWARE SALESMAN; understands roofing, spouting and assortment; also understands hardware business; can clerk in store; married man; sober, steady and honest; prefer job year round with some good Christian man; photograph submitted if desired; state wages and population. G. W. Burroughs, Gault, Grundy County, Mo. Jan. 26

By a young man with experience as CLERK in a hardware store; willing to do any kind of work about the store. "C. P. E. R.," Box 145, Wellington, Ohio. Jan. 26

In the stove business as SALESMAN for Maryland, Virginia, North Carolina and South Carolina, having traveled this trade for five years in this line of business; can give reference from last employer; salary no object to start; what I want is a place with a good house, and let my work be my best reference; have trade that I can carry with me. "J. H. H.," office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

By a young man who has had five and one-half years' experience at plumbing and gas fitting; can do city or country work; good reference. Wm. C. Ahn, 58 East Penn street, Morristown, Pa. Jan. 26

By a practical stove man of 16 years' experience, as SUPERINTENDENT; 41 years of age; molder by trade; married, and can furnish the best of references. Address "J. B.," No. 126, office of *The Metal Worker*, 96-102 Reade street, New York City, Jan. 26

By a PLUMBER; good lead worker: steady and reliable man, who studies his employer's interest. "B. D.," care W. Lawless, 74 Charles street, New York City. Jan. 26

By a young man, with five years' experience at tinners' trade; steady job desired; can furnish best of references; country preferred. Address, stating wages, "L. S.," Box E, Montrose, Mo. Jan. 26

TRAVELING SALESMAN to represent a first-class stove house on the road is now open for engagement; have had an experience of many years and thoroughly acquainted with all the trade; also well posted in the gasoline line. E. L. Tallmadge, Jr., 14 Woodbine street, Brooklyn, N. Y. Jan. 26

By a TIN AND SHEET IRON WORKER; 13 years' experience; understands all outside work, gutters, roofing, furnace, stove, range and fire place heater work and general jobbing; city or country. Louis Saltzman, 858 Charlotte street, Philadelphia, Pa. Jan. 26

TINSMITH, general jobber, thoroughly understanding setting and repairing heaters, ranges and furnaces; country preferred. La Forge, 337 Lexington avenue, Brooklyn, N. Y. Jan. 26

By a married man, of long experience as BOOKKEEPER or GENERAL TRAVELING AGENT for manufacturers of or dealers in machinery, implements, &c.; can furnish reference if required; have also had experience in the general hardware business; in or near Philadelphia preferred. "J. A. R.," Box 330. Bedford, Pa. Jan. 26

SHIPPING CLERK, who is well posted in the stove trade and has had many years' experience and accustomed to all details necessary, is now open for engagement. E. Lawrence, care A. Keller, 129 Beekman street, New York City. Jan. 26

An A1 stove and range SALESMAN wants to represent some Eastern foundry or stove house in Eastern Pennsylvania or New Jersey; ten years' experience; first-class reference. "Stove and Range," office of *The Metal Worker*, 96-102 Reade street, Now York City. Jan. 26

By a man who is willing to work for the interest of his employers, who thoroughly understands tin, sheet iron, furnace and steam work, with a fair knowledge of plumbing; strictly temporate; best of references. Box 112, office of *The Metal Worker*, 96-102 Reade street, New York City. Jan. 26

By a young man 24 years of age as METAL PATTERN MAKER; served an apprenticeship as tool maker, in addition to five years in pattern shop; familiar with foundry practice; a bright, capable man with ideas; for reference address any foundry in Newark, N. J.; salary moderate; any one wanting a pattern maker who knows his business and can attend to it, address E. E. Beckwith, care of A. C. Beckwith & Son, 62 Mechanic street, N. J. Jan. 19

KEUFFEL & ESSER CO.,

127 Fulton and 42 Ann Streets, NEW YORK.

Branches: 111 Madison Street, Chicago. 708 Locust Street, St. Louis.

Drawing Materials AND Surveying Instruments.

Write for

Keuffel & Esser Co.'s Catalogue of 1895.

26th Edition.

Enlarged by over 100 pages. The most complete and reliable catalogue, representing the largest and most complete stock in this line.

Special Notices.

FOR SALE.

An old and well established Stove, Tin and House Furnishing business in a good, lively and hustling town in Ohio. A well surrounded, thickly settled country. A very rich farming community. Owner has made money and doing a good business at present. Reason for selling, on account of being interested in other business. Address "GOOD CHANCE," office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

One set of 4-inch Rolls, 8 ft. long, made by Bertsch & Co., Cambridge City, Ind. Good as new. For particulars address
THE SIMS MFG. CO., Newark, O.

FOR SALE.

New Screw Cutting Lathe and Double Seaming Machine and second-hand Squaring Shears, Rotary Shears, Beading, Grooving and Setting Down Machine, also a number of other machines and stakes of different kinds and two large Heating Stoves, suitable for store or hall; cheap. Inquire
SAM'L A. TEETS,
507 Eighth Ave., New York City

$2000

will buy a full stock of Stoves and House Furnishing Goods with complete sets of Plumbers' and Tinners' Tools, also good stock of Iron Pipe, Fittings, &c. Location the best. Town good. Stock can be reduced some if desired. Purchaser has control of entire Plumbing trade. Best reasons for selling. Business was established in 1865. Address "RETIRED," office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE or TO LEASE.

An established Plumbing and House Furnishing business at Narragansett Pier, R. I. Inquire of W. H. GRIFFITH & CO., on premises, or address D. D. CLARK, Westerley, R. I.

FOR SALE.

A paying Hardware, Stove and Tinware business finely located in New England. Stock comprises a full line of Hardware, Paints, Oils, Tinware and Woodenware. Have good trade in Steam Fitting, Plumbing, Tin and Sheet Iron work. Exceptional inducements will be offered to right man. Address
"EXCEPTIONAL"
office of *The Metal Worker*, 96-102 Reade St., New York.

HELP WANTED.

A salesman acquainted with the best furnace trade of New England can obtain position with company manufacturing a complete line of warm air, water and steam heaters. Desire especial attention given to Warm Air Furnace Sales. Line well introduced. An excellent opportunity to right man, with the ability to handle trade. Salary and expenses. Address, with references, "TRIUMPH HEATERS," office of *The Metal Worker*, 96-102 Reade St., New York City.

FOR SALE.

The leading stove store in a growing manufacturing city of 20,000, near New York. This is an old, and the best business stand in the city. Large store and moderate rent. We do Steam and Hot Water and Hot Air Heating, Plumbing and Tinning. This is a good investment, but present owner has too much other business to see to. Can inventory down to $3000. Address "A A.," No. 119 office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE.

130 tons of Sheet Steel from a wrecked stand pipe, a large portion in good condition. Address
P. O. BOX 155,
Maryville, Mo.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.
D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars
YATES & CO., Rockford, Ill.

Special Notices.

RECEIVER'S SALE.

Notice is hereby given that by virtue of an order of the Howard Circuit Court in the case of John S. Connor, trustee, versus the William G. Fischer Manufacturing Company, the undersigned offers for private sale on and after the twelfth day of January, 1895, all of the real estate owned by the said plant and situated in Kokomo, Howard County, in the State of Indiana. He will also offer for sale at the same time all of the machinery, boilers, engines, tools, appliances, patterns and patents belonging to and useo in the manufacture of ranges and safes. In making said sale, he will offer to sell the real estate separately and also the machinery, tools, etc., above specified, or he will sell them as an entirety and will receive bids accordingly.
Terms, one-third cash, balance in nine and eighteen months with interest at 6%, with approved security.
G. W. LANDON, Receiver.

FACTORY AT WHITESTONE FOR SALE (30 minutes from New York), with boilers, 15 horse-power engine, machinery, tools, etc. Price, $5000; terms, $2000 cash, balance on mortgage at 6 per cent., if desired. Located on L. I. R. R. and the Sound, affording cheap water freights. Very advantageous for any light manufacturing, such as metal work, novelties, hardware, etc. Lot 50x100, facing on two thoroughfares, three-story brick building, 30x90, with boiler and engine annex building. Address "FACTORY," P. O. Box 2718, New York City.

FOR SALE.

An old established Hardware, Plumbing and Tin business in one of the best towns in California. Will invoice about $5000. Population 5000 and thickly settled surrounding country. Owner has made a small fortune in a few years and doing a good business at present. No shop-worn stock. Best of reasons for selling will be given to inquirers. Address "PACIFIC," care *The Metal Worker*, P. O. Box 521, New York City.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

WANTED

for 1895, Side Lines, to handle on commission. Must give territory.
HANSELL & BELSON,
144 North 2d St., Philadelphia

FOR SALE.

A No. 8 Sturtevant Blower, Countershaft and Pulley complete. This blower has been melting from 10 to 12 tons of iron per hour. Address
SCANLAN & CO.,
Louisville, Ky.

FOR SALE.
STOVE PLATE GRINDER.

Complete with countershaft, Tilting Table, Automatic Spindle. Made by the Tanite Co. Has never been used. Will sell very cheap.
S. GREEN & SONS.
Des Moines, Ia.

Special Notices.

WANTED.

A practical corniceman can make favorable lease of established shop. Some capital and good references required. Address "H. H.," office of *The Metal Worker*, 59 Dearborn St., Chicago.

ESTABLISHED 1853.

HOWSON & HOWSON,
Counsellors at Law,
Solicitors of Patents.

OFFICES:
PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row.
WASHINGTON,
Atlantic Building, 928 F. St.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.
PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.
E. B. STOCKING, Attorney at Law.
611 F ST., N. W., WASHINGTON, D. C.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address
"STOVE FOUNDRY,"
Office of *The Metal Worker*, 96-102 Reade Street, New York.

Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.
SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,

Planished, Britannia, Galvanized and Japanned

Sheet Iron Ware,

Stove Boards, Elbows, Etc.



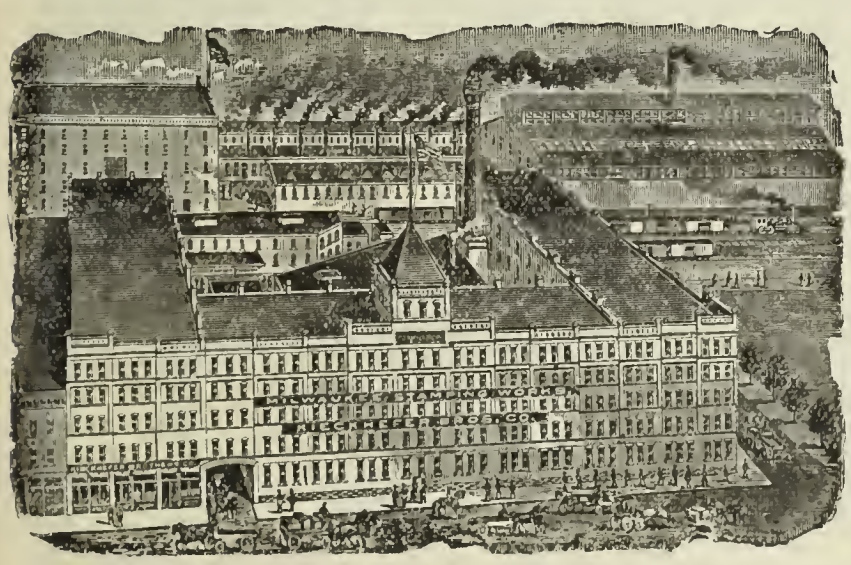
Agents for SPLENDID OIL COOKING STOVES

and MAJESTIC OIL HEATING STOVES,

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED,
JAPANNED AND ENAMELED
PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.

"PRINCESS" CHILD'S TRAYS.

PATENTED.



Fitting closely around body of child, and with high protection in front, it gives perfect protection to the child, and prevents soiling of table-cloth and carpet.

MANUFACTURERS FULL LINE

STAMPED, JAPANNED AND PLAIN TIN WARE.

KEEN & HAGERTY, SOLE MANUFACTURERS, BALTIMORE.

The Improved White Mountain Freezer



"Excellent Cream!"

And frozen in **4** Minutes with the **improved**

White Mountain Freezer.

The Leader for 1895. **All Dealers Will Want Them.**

The Best Freezer

The Best Seller

Positively the **only** one having a **duplex dasher** with **double self-adjusting wood scraping bar.**

SOLD BY ALL THE LEADING JOBBERS.

The White Mountain Freezer Co., - - Nashua, N. H.

ROCHESTER STAMPING WORKS. ROCHESTER, NEW YORK,



"ROCHESTER" TEAPOT.
Patented.

WANT **50,000** NAMES

To which they may address their

NEW CATALOGUE

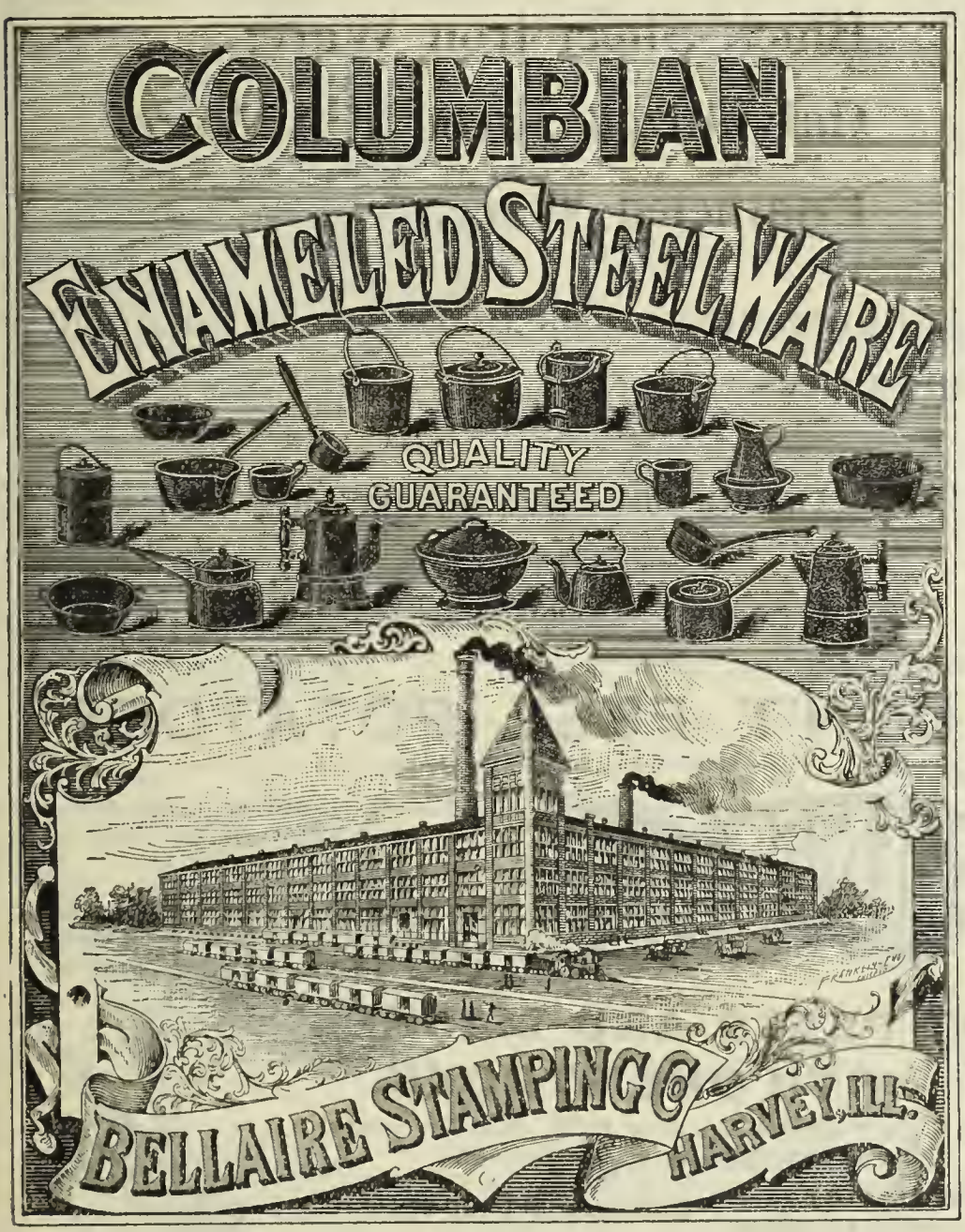
For 1895.



"ROCHESTER" CUSPIDOR.
Patent Pending.

No Goods Genuine without our Name.

COLUMBIAN ENAMELED STEEL WARE



N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

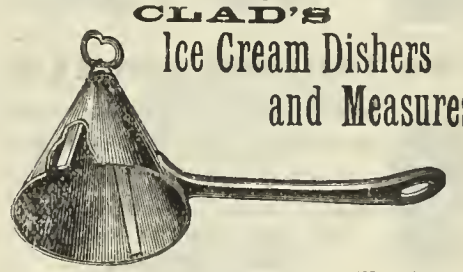
Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

CLAD'S
Iron Enameled Ice Cream Cans.



Do not buy Cans until you get our prices. We are Headquarters.

CLAD'S
Ice Cream Dishers and Measures.



Millions in use. Seamless cups, will not rust. German Silver knives; and not tin knives. Cream will not stick to sides. Sizes standard.



WRITE FOR PRICES.

V. CLAD & SONS,
MANUFACTURERS,
117-119 So. Eleventh St., Philadelphia.

The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O,

It Beats



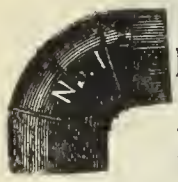
anything you ever saw as an Egg Beater, does it thoroughly in one minute. Beats, strains, measures and a host of other things it does. The best seller ever introduced. Is clean and very cheap.

Write for Prices in Lots.

Lightning Dasher Egg Beater Co.,
Toledo, Ohio.

NEW YORK ELBOW CO.

18 Cliff St., N. Y. City.



Makers of Elbows AND Roasters.



THE TRIUMPH COOKER,

WITH LOCK COVER.

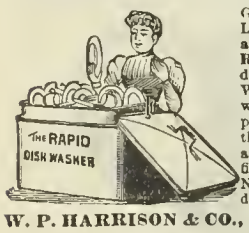


STEAMLESS, ODORLESS AND NON BOIL-OVER.

THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.

A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.

THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN



General or local Ladies or gents, **Agents. $75** a week. Exclusive territory. The **Rapid Dish Washer.** Washes all the dishes for a family in one minute. Washes, rinses and dries them without wetting the hands. You push the button, the machine does the rest. Bright, polished dishes, and cheerful wives. No scalded fingers, no soiled hands or clothing. No broken dishes, no muss. Cheap, durable, warranted. Circulars free.

W. P. HARRISON & CO., Clerk No. 12, Columbus, O.

— A MANUFACTURING FIRM which was besieged with applications for work hung a sign near the entrance of its establishment with the legend, "No Help Wanted."

One morning there appeared before the head of the house, to whom he was known, L——, a ne'er do well, who devoted his time to dreams of political glory rather than to books and accounts.

"Mr. S——, I want a job. As usual, I'm out of work. Can you give me something to do?"

Mr. S—— had formerly employed the applicant, and was compelled to discharge him, not so much for neglect as for general incapacity to knuckle down to good, solid work.

"My dear fellow, I'm very sorry; but didn't you see that sign when you came in?" said Mr. S——, very kindly.

"Yes, I saw it," L—— replied, "but you often told me I'm no help!"

L—— was employed.—*Harper's Bazar.*

— A RESPONSIVE AD.—Angry Caller: "I advertised for an electric battery yesterday."

Ad Clerk: "And did you not get it?"

Angry Clerk: "Get it! The ad overdid the business. My house was struck by lightning."—*Printers' Ink.*

For

1895

We respectfully solicit your orders for

Pieced Tin Ware,
Stamped Tin Ware,
Japanned Tin Ware,
Black Sheet Iron Ware,
Galvanized Sheet Iron Ware,
Enameled Ware,

and guarantee satisfaction, both as to quality and prices.

Respectfully,

The Geuder & Paeschke Mfg. Co.

Manufacturers,

St. Paul Ave. and 15th St., Milwaukee, Wis.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.



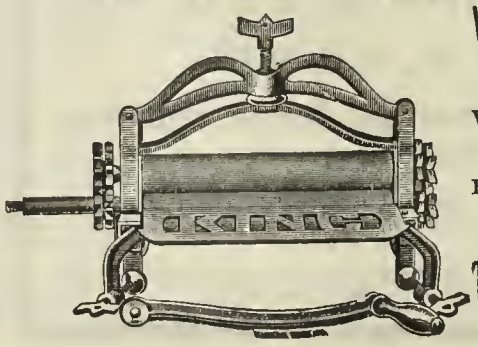
A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces.
Length, 10 inches.

Can be sold in all seasons.

Write to Manufacturers for Prices.

WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

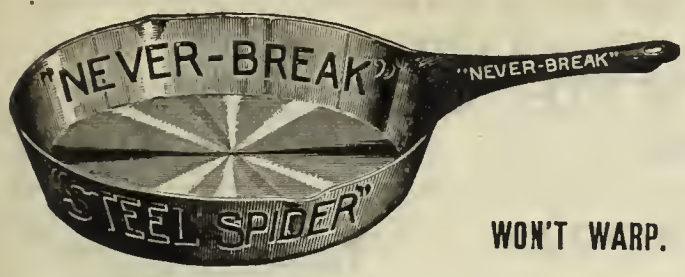
Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue:

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.

"NEVER-BREAK" STEEL HOLLOW WARE



WON'T WARP.



WON'T WARP.

STEEL SPIDERS, GRIDDLES, KETTLES, MASLINS, ETC.

Send for Catalognes of all our lines and Discounts.

THE STANDARD FOR WEIGHT, FINISH AND PRICE.

IMMEDIATE SHIPMENTS GUARANTEED.

The Bronson Supply Co., New York and Cleveland



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

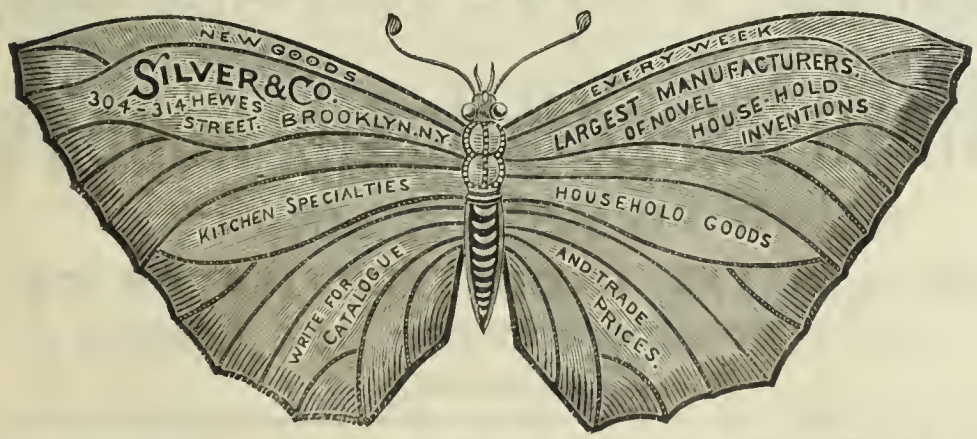
Write us for Catalogue and Prices.



ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.



EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES.

"MARION HARLAND" Tea and Coffee Pots and Urns.

Royal and Crown Roasters and Bakers.

Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses,

Steam Cookers, Milk Sterilizers, Bread and Cake Pans,

Display Stands and Household Novelties.



NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. / Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

CHAMPION STOVE CLAY

For lining stoves and ranges and repairing stove linings.

Made of Imported German Blue Clay, calcined, and Plumbago.

In 6 lb. bags, for Domestic use, $1.20 per dozen bags.
In Bbl. lots, for Dealers' use, - - - 1¼ cents per lb.

EASILY APPLIED, VERY DURABLE AND DOES NOT CLINKER.

MANUFACTURED BY

Bridgeport Crucible Co., = = = = Bridgeport, Conn.

We are also importers and sellers of pure CEYLON PLUMBAGO for polishing, lubricating, etc, and we respectfully solicit your orders.



Buy Iwan's Volcano Revolving Ventilating Chimney Top

The best in the World

For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.

FOR SALE BY
Berger Bros., Phila., Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Cincinnati Stamping Co., Cincinnati, O.
Illinois Roofing & Supply Co., Chicago, Ills.

IWAN BROS.
Sole Mfrs., Streator, Ills.



THE DIAMOND THIMBLE IS THE BEST.

Manufactured by
S. CHENEY & SON
MANLIUS, N. Y.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

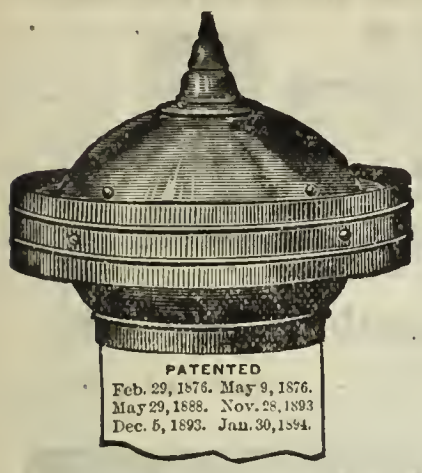
ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers original patterns

MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH

WHEN HE SAYS THAT THE

RUTLAND LINING

FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE, N. J.

"FIRESTONE"

Has proved I self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

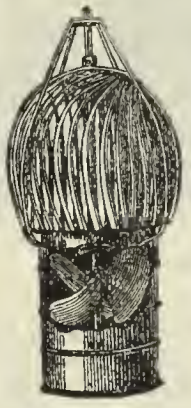
THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

SELF LUBRICATING

Rotary Screw Ventilators



WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

46 Cortlandt St., New York

☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

215 North 2d St., - - - Philadelphia.

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works.

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.

Established 1866.

EDWARD L. CALELY,

STOVE PATTERNS

TO ORDER.

945 Ridge Ave., PHILADELPHIA, PA.

CENTRAL PATTERN WORKS,

Stove and Furnace Patterns a specialty. Work first-class under a full guarantee.

E. C. HALTEMAN, Proprietor, Dayton, O.

Look Here, Tinners, Roofers AND Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

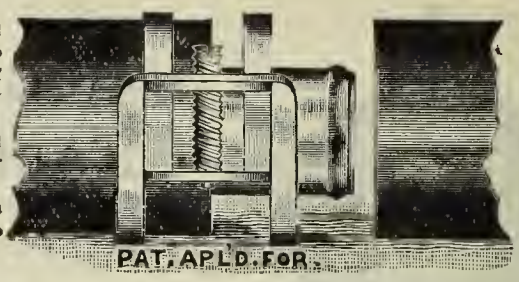
No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.
Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screwdriver being al the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust. Sold by Jobbers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.

NICKEL PLATING OUTFITS.

ZUCKER & LEVETT & LOEB CO.
8 TO 14 GRAND STREET,
NEW YORK, U. S. A

SEND FOR CATALOGUE OF
NICKEL & ELECTRO-PLATING SUPPLIES & POLISHING MATERIALS.

Birds in Attack.

Birds display great skill and cunning in the chase, the attack and in guarding themselves from injury during the struggle for supremacy. The secretary bird is the inveterate enemy and untiring pursuer of the snake. All sorts, even the most venomous, he hunts with a zest that is at once interesting and amusing. The snake flees from his foe, who follows, watching every opportunity for a blow. When the reptile turns, the bird uses one of its wings as a shield and strikes with its foot. The snake buries his fangs in the wing, but leaves the poison in the plumage, and the bird escapes unhurt. Repeated blows from the powerful claw confuse and disable the snake, and at last it falls, to be at once dispatched by thrusts of the sharp beak into its head. The bird then tosses its victim into the air, and catching it as it falls swallows it.—*New York Ledger.*

— BEYOND DISPUTE.—The story is told that Mr. Tyler, from the time of his election to the Vice-Presidency until the death of General Harrison, kept no carriage, owing to the insufficiency of his salary. When, however, he found himself elevated to the chief magistracy of the country, the financial difficulty being removed, he determined to set up an equipage.

He bought a fine pair of horses, engaged an Irish coachman, and proceeded to look about for a vehicle to suit his taste. He heard of one which was for sale by a gentleman residing in Washington, and went to look at it.

It had been driven only a few times, and was in excellent condition, so that the President, after a careful examination, felt satisfied with it. Before finally deciding the matter he had his Hibernian coachman take a look at the carriage, and give his opinion of it.

"It's jist the thing fer your honor," reported that accomplished person.

"But," queried Mr. Tyler, whimsically, "do you think it would be altogether proper for the President of the United States to drive a second-hand carriage, Pat?"

"And why not?" asked Pat, with a shrewd twinkle in his eye. "Shure, an' beggin' your pardon, ain't it yersilf that's a second-hand President?"—*The Outlook.*

ESTABLISHED 1830. INCORPORATED 1891

The Hanson & Van Winkle Co.,

MANUFACTURERS OF

NICKEL AND ELECTRO PLATERS' MATERIAL.

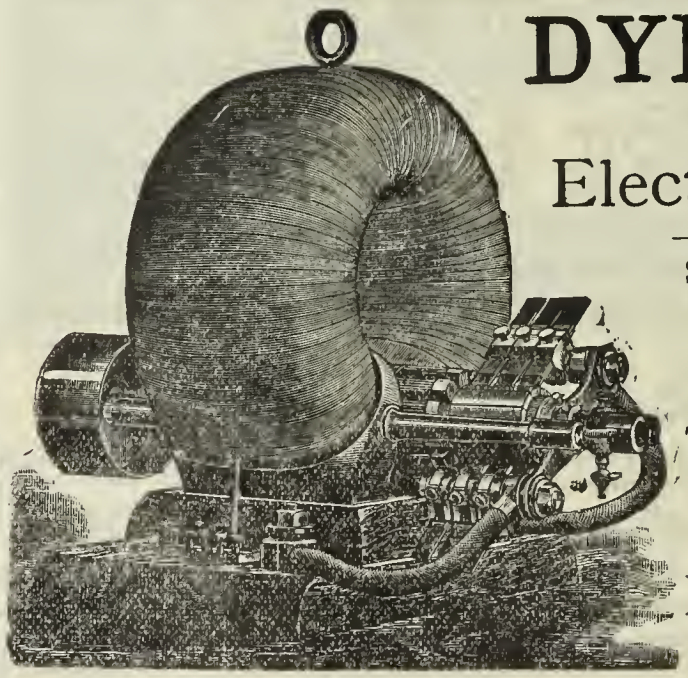


Nickel-Plating Outfits
From $20 upward.
DYNAMO-ELECTRO MACHINES
For all purposes.
The New H. & V. W. Dynamo Machine.
In sizes from No. 1 to No. 5.
FROM $100 TO $800.

These machines will be placed on 30 days' trial with responsible parties, and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.

219-221 Market St., Newark, N. J.
81 Liberty St., New York.
35-37 South Canal St., Chicago, Ill.

WE FURNISH EVERYTHING.



DYNAMOS
—FOR—
Electro-Plating.

SIMPLE, DURABLE and EFFICIENT.

The Best Machine Made. Satisfaction Guaranteed.

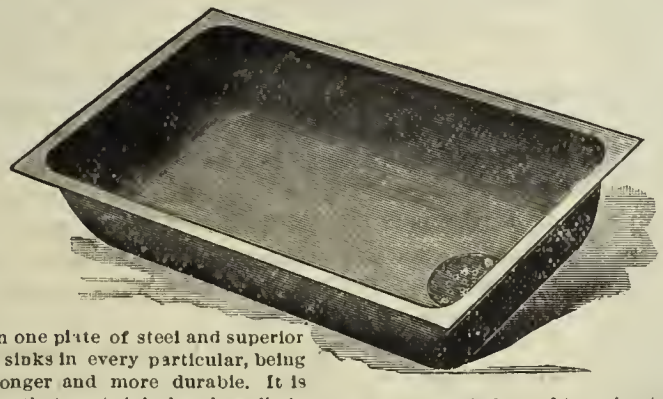
—THE—
Eddy Electric Mfg. Co.
Windsor, Conn.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street New York.

THE

NEW ERA

Wrought Steel Sink



Drawn from one plate of steel and superior to cast iron sinks in every particular, being lighter, stronger and more durable. It is well known that cast sinks break easily in shipping, storing and placing in position for use and from other causes. This sink being made of wrought steel will not break from any cause whatever, and being less porous than cast iron is comparatively odorless.

The bottom is formed tapering to the center and the outlet, giving the sink perfect drainage. The bowl and projecting thimble are stamped in one piece from the same plate, enabling the attachment of strainer and pipe more satisfactorily than is possible with cast sinks.

: : THE : :

Kilbourne & Jacobs Man'fg Co.,

Columbus, Ohio, U. S. A.

Being The Originators

of wrought steel sinks, we are in position to supply them in any style desired, at prices which we shall be pleased to quote upon application.

DRAWN STEEL SINKS

Anchor and Diamond Brand

—MANUFACTURED BY—

L. Wolff Manufacturing Company,

GENERAL OFFICES, 93 W. Lake Street, Chicago.

Write for Illustrated Price-List Just Published.

MAPLE SYRUP CAN and SAP BUCKET STOCK.

We are now prepared to quote and ship promptly. Get our prices before buying.

J. M. L. A. OSBORN, - - - CLEVELAND, O.

SECOND EDITION.

PRACTICAL HINTS —ON— JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

43 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

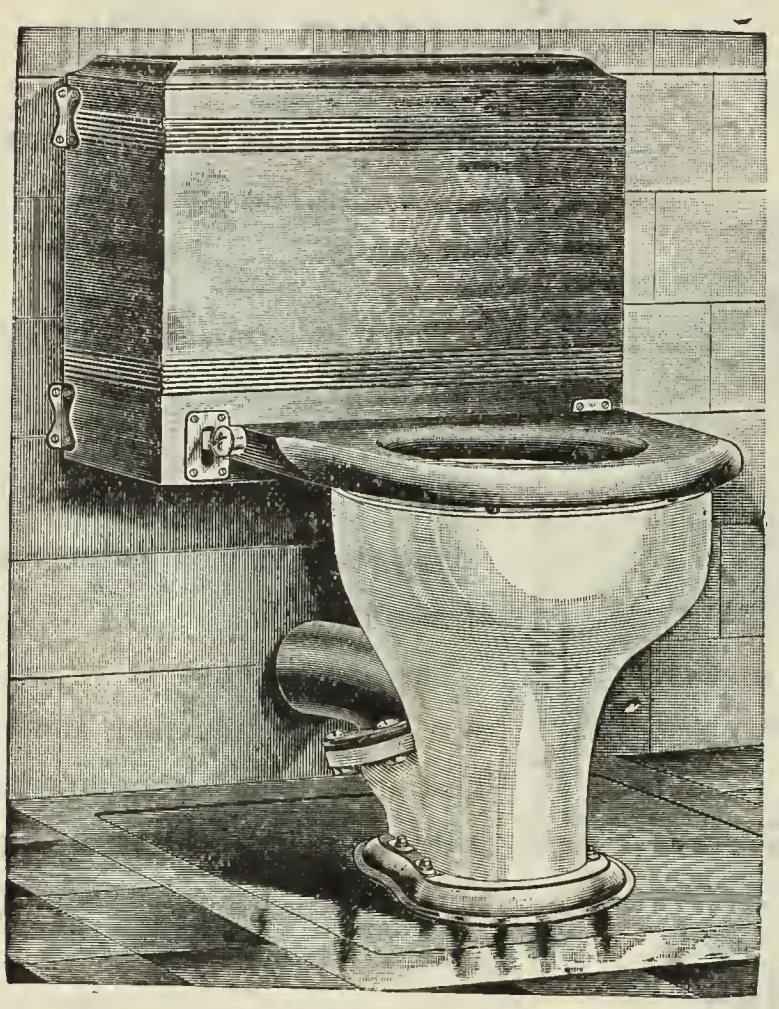
DAVID WILLIAMS,

PUBLISHER,

96-102 Reade St., New York.

PURITAN WASH DOWN WATER CLOSET.

Best Closet Yet Produced for Either Public Places or Private Houses.



In presenting this Water Closet Apparatus to Architects and Plumbers and those interested in Sanitary Plumbing, will say that our aim has been to **Improve the Quality, Simplify the Construction and Reduce the Cost of Fitting in Place,** and we feel confident that we have done all this in the present Apparatus, and more too, **as it will discharge more matter, keep cleaner with less water and make less noise in the operation** than any Water Closet Apparatus now on the market.

The Closet is especially well adapted for Fire Proof Structures, as the Soil Pipe may be run above the floor, either behind or on the face of the finish. Another very good feature—stoppage can only take place in the bowl (where it can be reached from the top). Anything that passes this point will not lodge in the Soil Pipe.

These Closets are made of Vitreous Earthen Ware—that is, an absolutely non-absorbing material, warranted not to craze. Each Closet is stamped with a Bull's Head, our trade-mark.

The tank is provided with a cover finished to match. This cover deadens the noise, prevents fouling by dust and also prevents malicious persons from getting at or throwing anything into the tank.

The tank is worked either by hand action or seat action.

The distance from top of tank to finish of floor is 2 feet 6½ inches. From face of wall to front of Closet, 2 feet 1¾ inches. Depth of seal in Closet 2¾ inches.

SEND FOR CATALOGUE.

MANUFACTURED BY

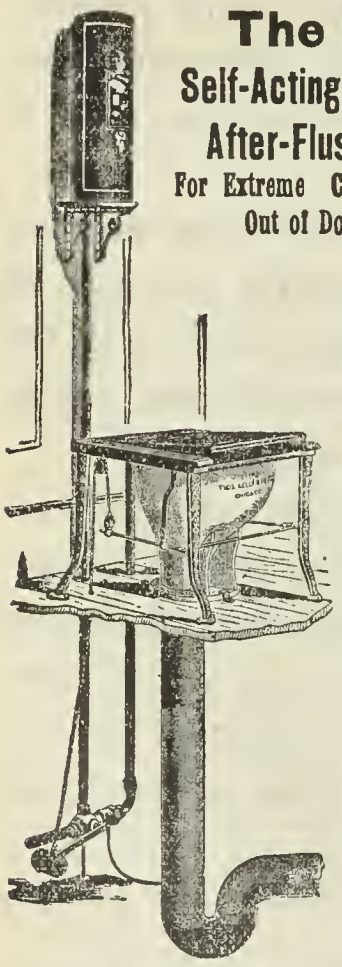
DALTON-INGERSOLL COMPANY

169-175 High St. & 55-61 Purchase St. (Ft. Hill Square),

BOSTON, MASS.

The Kelly Self-Acting Frost-Proof After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

—SEND FOR CATALOGUE.—

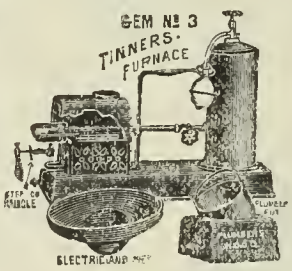
Thomas Kelly & Bro.,

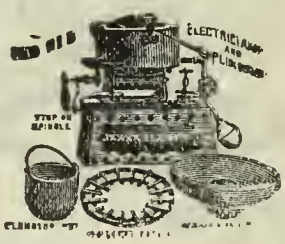
124 Franklin St., Chicago,

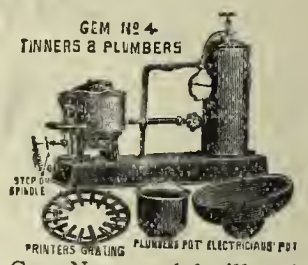
Manufacturers of Permanent Plumbing Goods.

Burgess Gem Gasoline Soldering Furnaces.

Have Slotted Cylindrical Cast Iron Burner, shape is such that Solder Cannot Clog them.







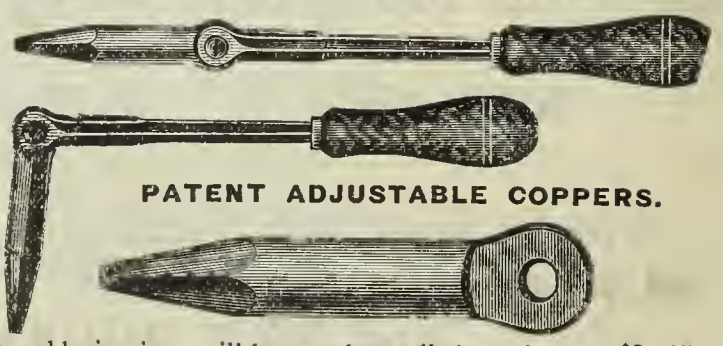
Gem No. 4 and 6 will melt 12 lbs. of lead in 8 minutes, heat your coppers and melt metal at same time.

Gem No. 3 and 6 is sold with a GUARANTEE that if it cannot be worked out of doors or on roofs in all kinds of weather **your money will be refunded.**

Manufactured by **Burgess Soldering Furnace Co.,** COLUMBUS, OHIO.

Covert Pat. Adjustable Soldering Irons and Coppers

It is a complete tool in every respect, and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.



PATENT ADJUSTABLE COPPERS.

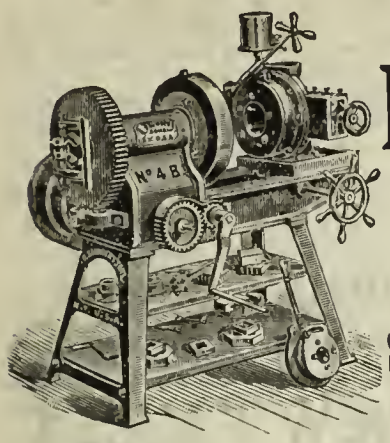
☞A sample of ⅞ in. soldering iron will be sent by mail, free of postage to any address, on receipt of sixty cents (60c.).

FOR SALE BY ALL GENERAL HARDWARE AND PLUMBERS' SUPPLY HOUSES

COVERT MFG. CO., - West Troy, N. Y.

D. SAUNDERS' SONS,

MANUFACTURERS OF



PIPE Cutting AND Threading MACHINES

All sizes ¼ inch to 16 inch for Pipe Mill, Gas and Steam Fitters' use. Tapping Machines for steam-fittings, also

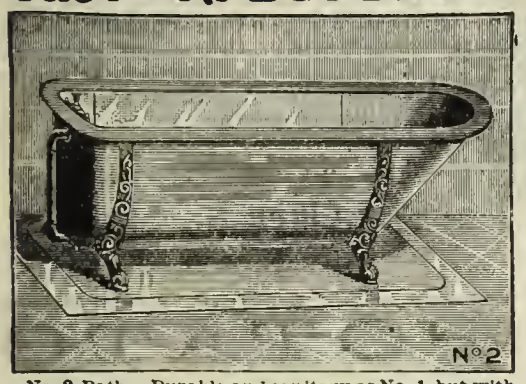
STEAM and GAS FITTERS' HAND TOOLS.

SEND FOR CATALOGUE.

No. 4 B Machine, ⅛ to 4 inch. Hand or Power.

No. 25 Atherton St., Yonkers, N. Y.

The PERFECT BATH



No. 2 Bath. Durable and sanitary as No. 1, but with less variety.

INDESTRUCTIBLE

THE STEEL CLAD BATH.

INEXPENSIVE.

Common sense demands a sanitary bath, economy an inexpensive one, good taste one which can be decorated to harmonize with its surroundings. The **Steel Clad Bath** (copper lined) offers these advantages. It is also durable, and has, if desired, connected overflow and waste pipe. All metal except rim. No wood to harbor vermin or disease. Don't buy an imitation—get the **Steel Clad.** Send for catalogue.

For sale by all jobbers and plumbers and the

STEEL CLAD BATH CO. OF NEW YORK,

447 to 453 W. 26th St., New York City.

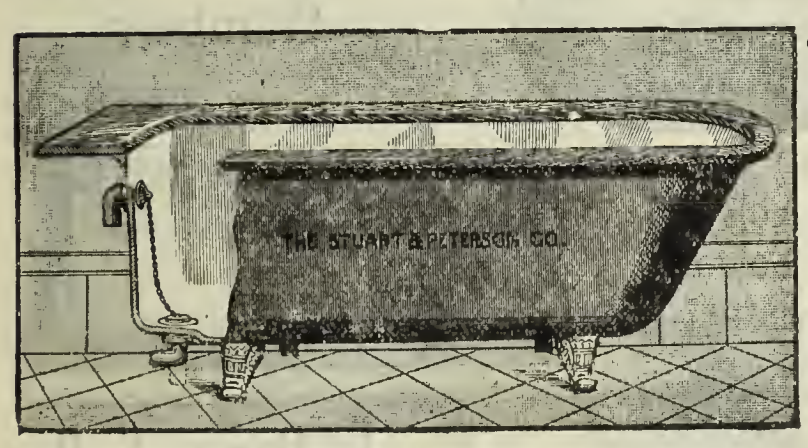
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,

Detroit, Mich.

GEORGE BOOTH, President.

WELL!! WELL!! WELL!!



PORCELAIN LINED BATHTUBS, WITH Overflow Strainers and Plugs Complete

$28.00

WRITE US.

The Stuart & Peterson Co.,

Burlington, N.J., U.S.A.

Porcelain Lining to order.

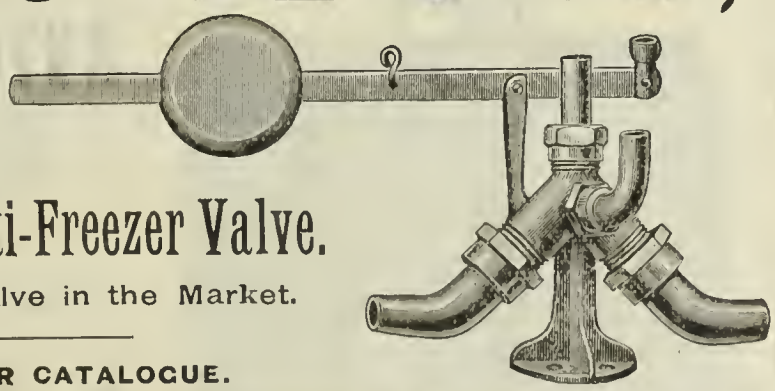
Special Goods to Order.

ZERO VALVE CO.,

212 Seneca St.,

BUFFALO,

N. Y.



Vollmer Anti-Freezer Valve.

Cheapest Valve in the Market.

SEND FOR CATALOGUE.

ROOFING SLATE.

OUR BANGOR UNION, ALBION & MAMMOTH VEIN QUARRIES

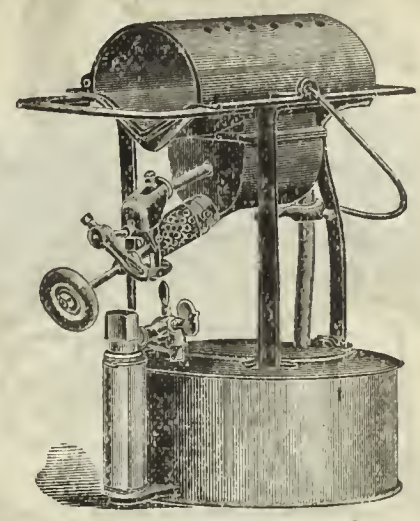
PRODUCE THE FINEST SLATE IN PENNSYLVANIA & VERMONT

HAND SHAVED BANGOR SLATE BLACK BOARDS

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS

AULD & CONGER, 100 EUCLID AVE., CLEVELAND, OHIO.

NO. 1 BONANZA FURNACE,



For Tinners only. Price $6.

Hinged arch top. Galvanized steel with brass top tank. Best furnace for roofs or cornice work. Cannot blow out. Rubber pump handle. Burns from both sides. Heat terrific; heats 5-pound coppers red in 3 minutes; heats 10-pound coppers in 5 minutes; melts 10 pounds lead in 5 minutes. Hottest fire ever produced from gasoline.

Write for New Catalogue. Special Low Prices for Cash with the Order.

M. L. HULL, - CLEVELAND, OHIO.

DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.



The only Portable Folding Bathtub made; can be stored in space 2¼ x 2½ x 6 feet; can be moved from bathroom to sickroom.

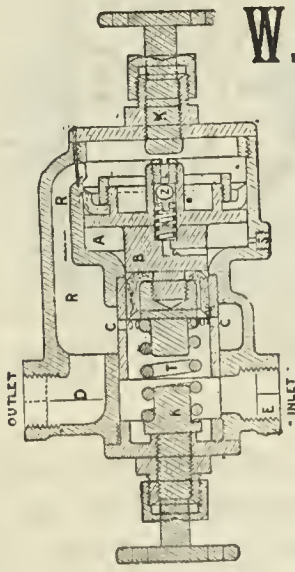
Write for catalogue and discounts

MADE BY

THE DAY MFG. CO.

Detroit, Mich., U. S. A.

W. G. Taafel's Pressure Regulator.



Send for Price-List.

NEWARK REGULATOR COMPANY,

Newark, Ohio.

— THE COOK A TREASURE. — Mr. Newedd: "What! No cook stove in the house? I gave you money to buy one."

Mrs. Newedd: "Yes, my love, but I found I hadn't enough to buy a stove and hire a cook, too, so I let the stove go. But the cook is here and she's a treasure. She has just gone out to get us some crackers and cheese."—*New York Weekly.*

— GIVING AWAY.—The giving of the bride by her father is not a very important part of the marriage ceremony, but the giving away of some maidens by their little brothers has prevented many marriages. —*New London Telegraph.*



W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

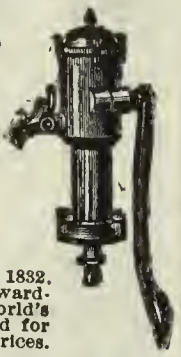
85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON

156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS'

REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



FORCE AND LIFT PUMPS



GREATEST IMPROVEMENT OF THE AGE.

Simple, durable, powerful, easy to operate never affected by frost. Patent GLASS VALVE, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.

Gas-Lighting and Gas-Fitting,

—INCLUDING—

Specifications and Rules for Gas Piping, Notes on the Advantages of Gas for Cooking and Heating, and Useful Hints to Gas Consumers.

By WM. PAUL GERHARD.

A pocket-book for gas companies, gas engineers and gas fitters, for manufacturers of gas fixtures and dealers in gas appliances, for gas consumers, architects and builders, health officers and sanitary inspectors.

Second Edition, Rewritten and Enlarged.

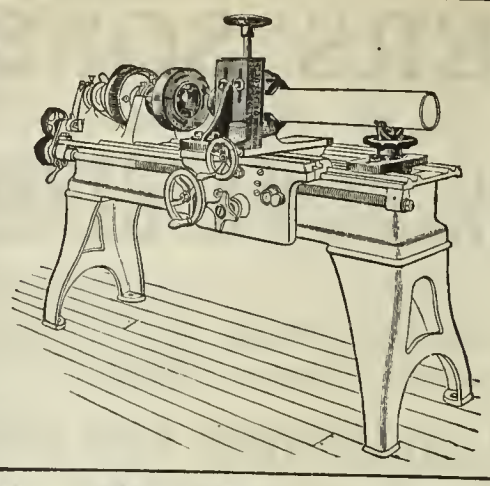
16mo, boards, 50c.

Sent, post-paid on receipt of price by

DAVID WILLIAMS, Publisher & Bookseller,

96-102 READE ST., NEW YORK.

Pipe and Bolt Threading Attachment for Lathes



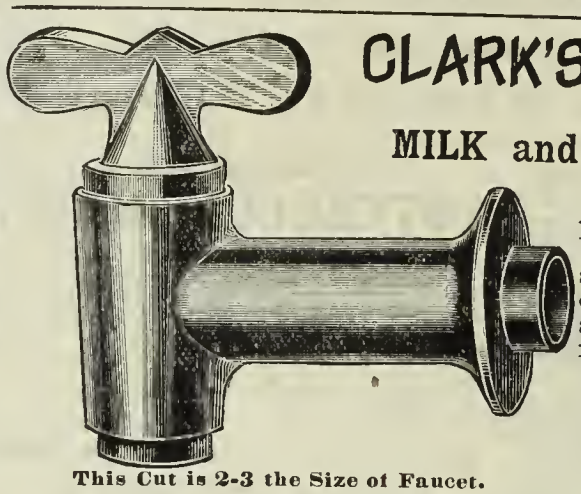
When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.



This Cut is 2-3 the Size of Faucet.

CLARK'S NEW FAUCET

—FOR—

MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.

A RAW POTATO



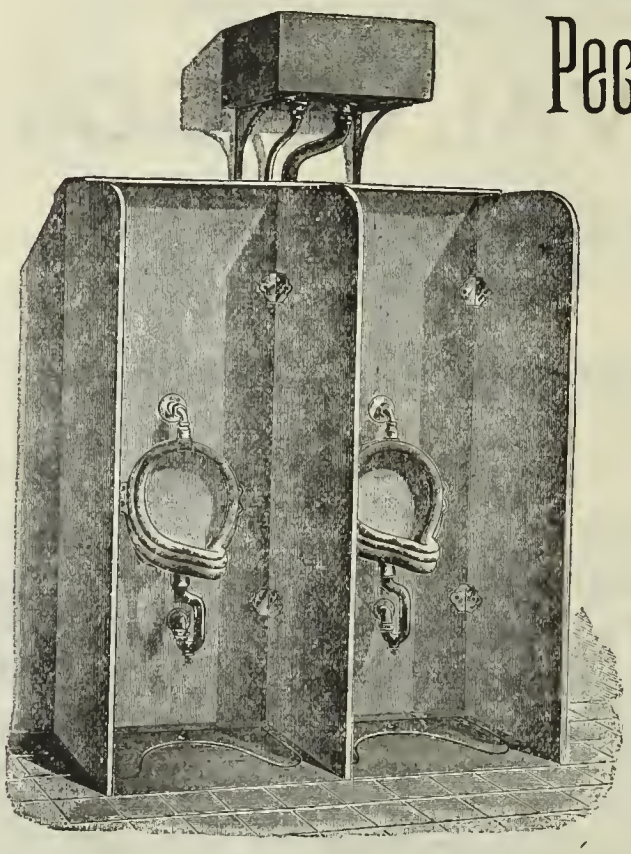
Up to Date Plumbers Use

Bailey-Farrell Mfg. Co.'s Prepared Soil and S. S. S. Solder.

Special Price for Trial Lots.

Pittsburgh, Pa.





Peck Bros. & Co.

AUTOMATIC URINAL.

Fig. 364

Catalogue of 1893.

WE MAKE

Fine Sanitary Work

OF ALL KINDS.

See our Catalogue.

Visit our Showrooms at

47 Cliff St., NEW YORK. | 259 Wabash Ave. CHICAGO. | 127 Chestnut St., NEW HAVEN, CT. | 65 Oliver St., BOSTON.

Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

1

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

A sample One-inch "Skeleton" Pipe Die, either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you **62 cents,** and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

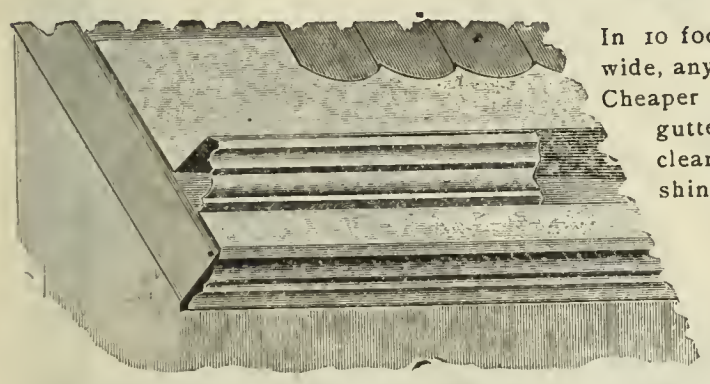
You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

HENRY B. PANCOAST & CO.,

243-245 South 3d Street, Philadelphia, U. S. A

ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.

Sims' Ornamental Roof Gutter.



In 10 foot lengths, 12 in. to 30 in. wide, any fall desired, will not leak. Cheaper than wood or any other gutter. One continuous piece, clear up under slate or tin or shingle. Write for prices.

The

Sims Mfg. Co.,

Newark, O.

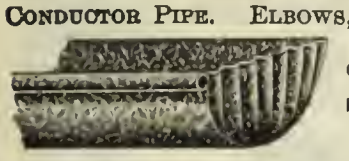
Holton's Patent Detached Slip Joint Eave Trough.

10 FEET LONG.



A Perfect Water Tight Joint Without Solder.

"No rights and Lefts." Made of BEST GALVANIZED STEEL and TIN. Also HOLTON'S PATENT "SOLID" END PIECE. PLAIN and CORRUGATED CONDUCTOR PIPE. ELBOWS, SHOES, HANGERS, ETC.

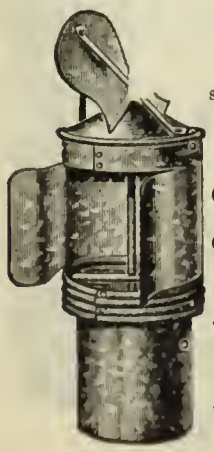


☞ We are headquarters for Copper Conductor and Gutter Copper is not as expensive as you think.

The Niles Mfg. Co., Niles, Ohio.

REVOLVING CHIMNEY CAPS,

Galvanized Iron.



These Caps revolve on heavy glass bearings, and are made from No. 26 iron. All sizes; cheapest and best.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets. Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted Leader, cheapest and best in the market. Sheet Iron Piping, Stove Pipe and Fittings of every description.

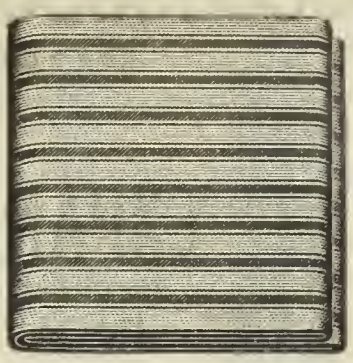
GENERAL GALVANIZING TO ORDER.

THE JERSEY CITY GALVANIZING CO., Manufacturers and Jobbers in

GALVANIZED MATERIAL OF EVERY DESCRIPTION.

Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE.



It requires considerable skill to make a good wiped joint—considerable skill, also, to make a proper **Wiping Cloth.** And while one cannot manufacture a wiped joint, we can and do make and sell a perfect **Cloth.**

One that will outwear two of the ordinary kind.

One that you can buy cheaper than you can make.

Send us 12 cents (and 2 cents for postage) for a sample (any size; for any kind of a joint) and see if the "Columbia" Wiping Cloth is not a model of its kind, then send 70 cents (and 12 cents for postage) for six of any size by mail. See that each one is stamped "Columbia."

THE

J. W. Chamberlain Co.,

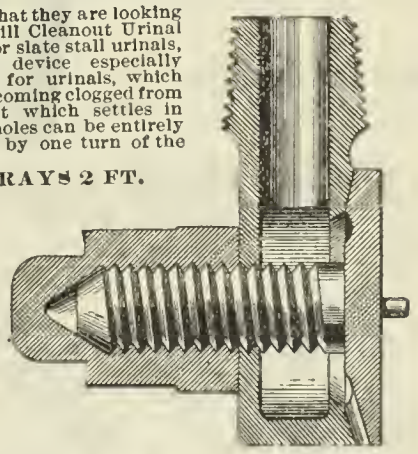
Plumbing and Steam Fitting Specialties,

BANGOR. - - MAINE.

Plumbers, Builders, Architects!

Just what they are looking for. Savill Cleanout Urinal Spray for slate stall urinals, a new device especially adapted for urinals, which upon becoming clogged from sediment which settles in tits or holes can be entirely cleaned by one turn of the nut.

SPRAYS 2 FT.



(Patent applied for.)

FOR SALE BY

SAVILL, WALLS & CO.,

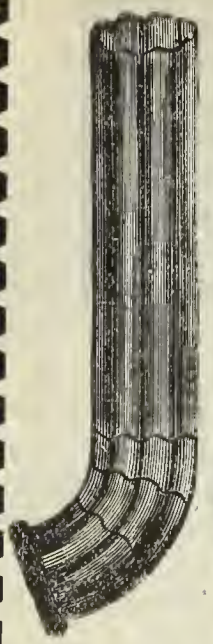
Dealers in Plumbers' Supplies,

1229 and 1231 Budden Street, - PHILADELPHIA.

Write for circulars.



OUR ADJUSTABLE STOCKS and DIES are universally acknowledged to be the **BEST!** We also make all our Tools on the same principle, of the **Best Material** and **Workmanship,** and always with a view of *time and labor saving in their use.*



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.





BROUGHTON SELF-CLOSING

COCKS.

EVERY ONE WARRANTED.



Send for Circular.

E. STEBBINS MF'G CO. Sole Manufacturers

BRIGHTWOOD, MASS.

EAVES TROUGH HANGERS.

PROUDMAN BROS.,

MERIDEN, CONN.

EAVE TROUGH

THE KANNEBERG ROOFING CO.,

CANTON, OHIO, U. S. A.

MANUFACTURERS OF

Patent Eave Trough and Hangers,
Conductor Pipe,
O. G. and Box Gutters,
Ridge Roll and Capping,
Ventilators,
Finials,
Cresting.

Patent Steel Roofing,*
Metallic Shingles,
Crimped, Beaded and Corrugated Steel,
Steel Weather-Boarding,
Sheet Steel Pressed Brick,
Mixed Roof Paint.
Building Paper, etc.†

* Write for sample.

† Get Illustrated Catalog.

CONDUCTOR Pipe.

Corrugated Expanding Conductor

OF GALVANIZED IRON AND COLD ROLLED COPPER.





JAMES A. MILLER & BRO.,

129 and 131 South Clinton St.,

CHICAGO.

Leather and Rubber

WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.



USE "OUR OWN" BASIN PLUGS.

No other lettering on them.

SAMPLE DOZEN ASSORTED $1.

HANDSOMELY NICKELED. BEST QUALITY STOCK

H. O. CANFIELD

MANUFACTURER OF

MOULDED RUBBER GOODS.

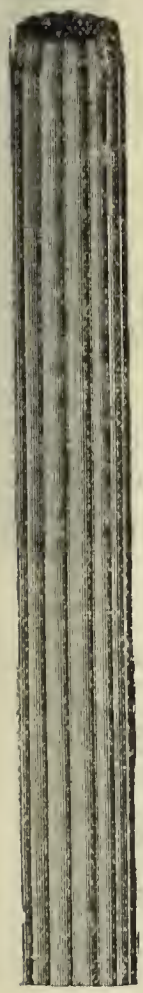
BRIDGEPORT, CONN.

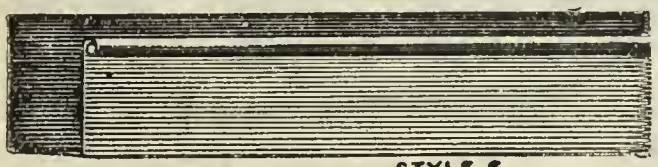




BOWERS, GALPIN & CO.

Eaves-Troughs, Gutters, Miters, Trough-Ends, Conductors, Ridging. **BINGHAMTON, N. Y.**





STYLE S.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

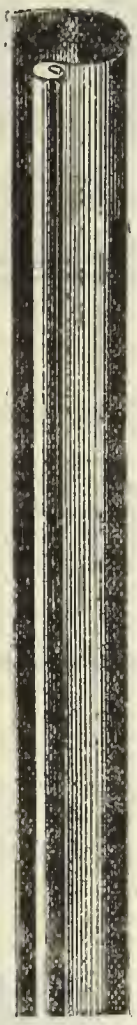
PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

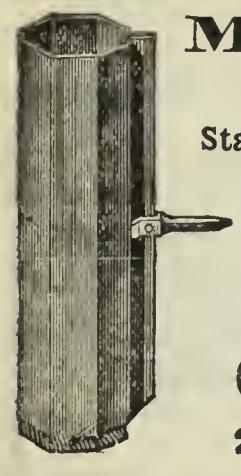
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,

(INCORPORATED.)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.

The "O.H." One Piece

PLAIN ROUND and CORRUGATED

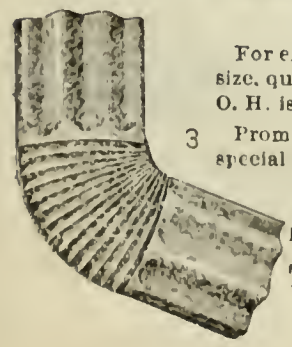
CONDUCTOR AND STOVE PIPE ELBOWS.

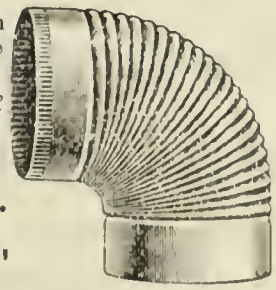
(PATENTED OCT. 25, 1892.)

For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.



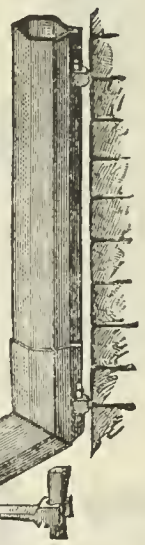


For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.

THE IRWIN & REBER
PATENT
EXPANDING WATER CONDUCTOR.
MANUFACTURED BY THE
S. S. S. Conductor Co.
LIMITED,
163 Lacock Street,
ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.

THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade,
Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

6-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.

COLWELL LEAD COMPANY,

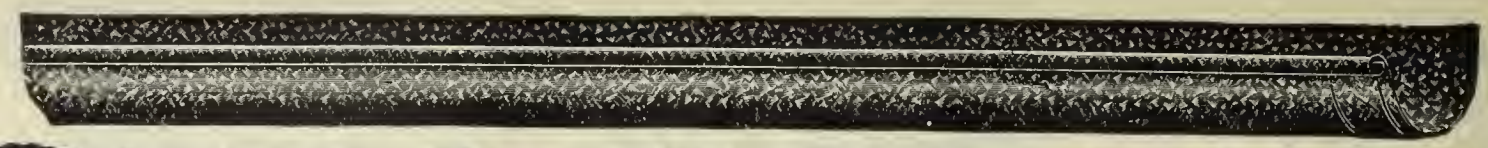
Centre Street, and 681 Sixth Avenue, Cor. 30th Street, NEW YORK.

LEAD PIPE, SHEET LEAD, SHOT,

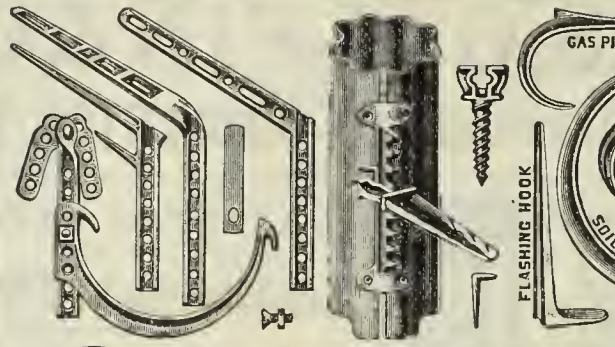
Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

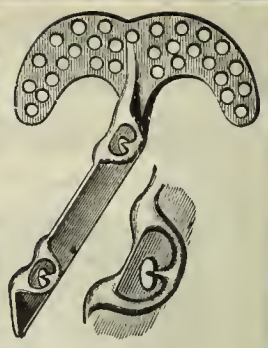
IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order.

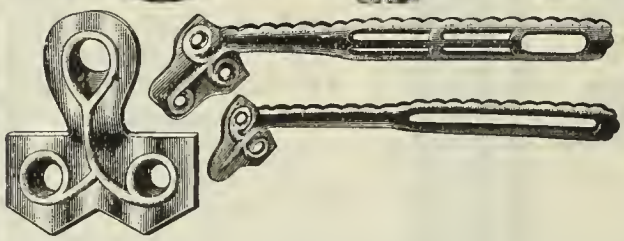












Berger Bros.,

TINNERS' HARDWARE, ROOFERS' SUPPLIES.

231 and 237 Arch St., Philadelphia.

GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,
. . . . Largest Stock, Greatest Variety, Prompt Shipments.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Hods, Elbows, Ears, Handles, Valves and Plungers, Etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.



The Climax Ratchet Stock

Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, $10.00

No. 2 threads 1 to 2 in. pipe, takes 2½, 3 and 4 in. die, $17.00

For sale by leading jobbers.

Manufactured Solely By

C. M. KEMP MFG. CO.,

Baltimore.



TINNERS, ATTENTION! GREAT REDUCTION IN PRICE.

Best Eave Trough Fastener in the World.

Yapp Patent Champion Fastener

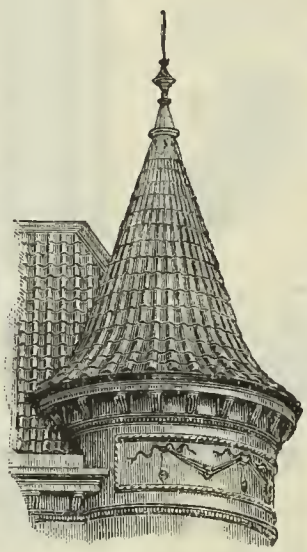
MANUFACTURED BY

WALTHER & CHRISTMAN,

Successors to CHAS. BODY,

269 to 275 Central Ave., Cleveland, Ohio

Send for sample and price-list



PATENTED JANUARY 3, 1894

Merchant's Graduated "Spanish" Tiles

FOR CONICAL TOWERS DOMES ETC.

COPPER TIN OR STEEL

SPECIAL GLAZED TILE
OF ANY COLOR
MADE TO ORDER

Full information Given with prices on application

Ornamental and Durable.

The "Star" Ventilator

ABSOLUTELY STORM-PROOF

For Ventilating Theatres, Churches, School-Houses also Mills of all kinds, Stables Etc

WRITE US FOR A COPY OF OUR BOOK ON VENTILATION



PATENTED MARCH 30, 1886

High Grade Roofing Tin

EVERY SHEET STAMPED WITH BRAND AND THICKNESS

"Merchant's Roofing"
EXTRA HEAVILY COATED

"Alaska"
HEAVILY COATED

ABSOLUTELY NO WASTERS

CHICAGO
NEW YORK

MERCHANT & CO
INCORPORATED
SOLE MANUFACTURERS
PHILADELPHIA

BROOKLYN
LONDON

PHILADELPHIA, JANUARY, 1895.

Architects AND Roofers

Please Read this Proclamation.

It Relates to Our

"Pennsyl" Old Method Terne OR Roofing Plate.

Article 1st. It is **Treble Coated, Stamped** and **Squared.**

" 2d. It was introduced by us in the year 1879.

" 3d. We now sell 50 boxes where we sold one box 5 years ago; this alone is sufficient guarantee of its merits

" 4th. We **guarantee** every box of 20 x 28 to contain not less than **45 lbs.** of actual coating to 112 sheets.

" 5th. It is simply out of the question for us or **any other Manfacturer** to possibly make a better Roofing Plate.

" 6th. We ask no favoritism, only justice.

" 7th. Consult any Roofer or Tinner in your City or Town and they will give you unbiased proof of its real value.

Samples cheerfully mailed.

Gummey, Spering & Co.,

Manufacturers and Importers

Tin Plate and Metals.

NEW CASTLE

New Castle Steel and Tin Plate Co., New Castle, Pa.

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

TRADE-MARK AMERICA RG CLEANED.

PHILLIPS' ROOFING. EXTRA HEAVY COATED. Guaranteed 35 Pound Coating.

"BOSTON" ROOFING. HEAVY SPANGLED TERNE. Guaranteed 20 Pound Coating.

NATIONAL (Dark) TERNES. (WORCESTER GRADE.) Guaranteed 10 Pound Coating.

THE PHILLIPS TIN PLATE CO., Philadelphia.

☞ SEND FOR SAMPLE AND NEW TARIFF PRICES.

PHELPS, DODGE & CO.,

11 Cliff St., N. Y.

Tin Plate, Pig Tin, Sheet Iron, Sheet Zinc, &c.

PHELPS' TREBLE COATED ROOFING.

Pontymister Old Style Ternes

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade.

TIN AND IRON SHOW CARDS.

110 John St., - New York.

ALAN WOOD COMPANY,

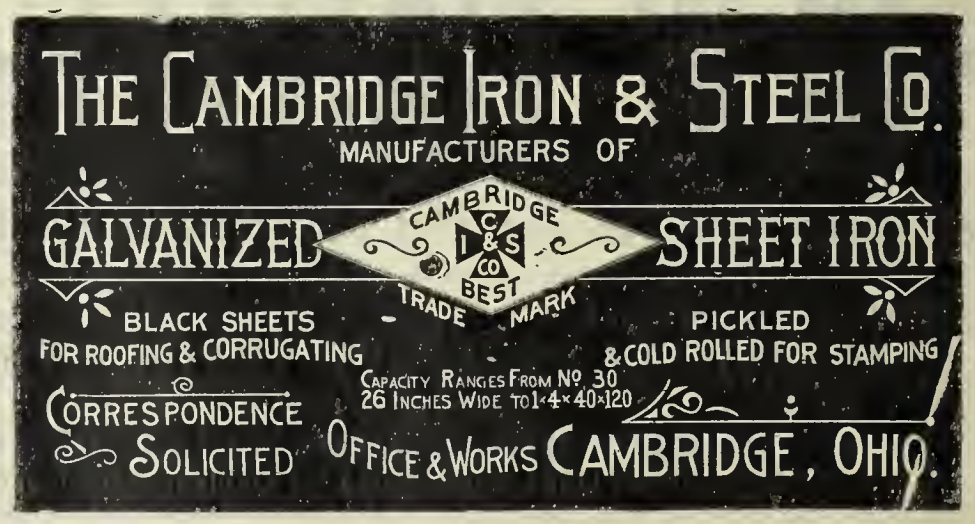
MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.



ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

MONARCH OLD PROCESS

ROOFING PLATES

Have been on the market for ten years and have never varied from their high standard of quality.

P. B. CALVERT & CO.,

Write for Prices. Philadelphia, Pa.

JOHN DUNLAP COMPANY'S

SPECIAL BRAND ROOFING PLATES.

SUPERIOR GRADE.

I D UNLAP'S OUBLE C IPPED

Or I X.

PALM OIL PROCESS.

EVERY BOX GUARANTEED. PITTSBURGH, PA.

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. BRIDGEPORT, OHIO.

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD

Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,

535 to 547 West 15th Street, New York.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. **Brooklyn, N. Y.**

BLACK DIAMOND
EXTRA TRADE MARK COATED
ROOFING PLATES

are thoroughly AMERICAN

In every respect. One trial will convince you of their superiority over anything you have ever used Send for sample and thoroughly test it. Manufactured by HENRY W. SCATTERGOOD.

Black Diamond Tin Plate Works, 51 & 53 Laurel St., Phila.

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price, 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also;

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, ***Fine Steel Sheets a Specialty.***

Buy Plain and Corrugated Conductors and Single and Double Beaded Eave Troughs, all in 10 ft. lengths; also Brick Siding, Corrugated Roofing, Cornices, &c., of

ALLEN'S CORRUGATING WORKS,

422 and 424 W. Randolph St., CHICAGO, ILL.

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

—MANUFACTURERS OF—

SHEET METAL ROOFING, SIDING AND CEILING

—OF ALL DESCRIPTIONS FROM—

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.

Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.

Factory, 113 to 133 Soulard Street, ST. LOUIS, MO.

Bright Charcoal Tin Plates.

Coke Tin Plates.

A Full Assortment of Sizes.

ALSO

20 x 28 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	LILY—Stamped and Squared.
IC	DYFFRYN,
IC	WORCESTER.
200 lbs.	WORCESTER.
IC	W T R—Stamped.
200 lbs.	W T R.
IC	P T L.
IC	DEAN
200 lbs.	DEAN.
IC	PETREL.
200 lbs.	PETREL.
IC	ALYN.
IC	BAAN.
IC	MANSEL.
IC	ALBAN.
200 lbs.	ALBAN.
190 lbs.	ALBAN.
200 lbs.	CAWDOR.
190 lbs.	CAWDOR.

14 x 20 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F—Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	W T R—Stamped.
100 lbs.	W T R.
IC	P T L.
IC	DEAN.
100 lbs.	DEAN.
IC	PETREL.
100 lbs.	PETREL.
100 lbs.	CAWDOR.
IC	BAAN.

WASTER ROOFING.

ICW	20x28	GWERNEN.
ICW	"	W T R.
200 lbs. W	"	ALBAN.
190 lbs. W	"	ALBAN.
180 lbs. W	"	DYFFRYN.

SOLDER—The reduction in Pig Tin has made prices much lower.

RUSSIA SHEET IRON (Genuine)—The duty has been reduced, and prices are lower than last year. No. 8 to No. 16 inclusive, sheets 28x56 inches.

BRUCE & COOK,

190 Water St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

Standard Books

—ON—

FOUNDRY PRACTICE.

The Encyclopedia of Founding and Dictionary of Foundry Terms,

used in the practice of molding. Together with a description of the tools, mechanical appliances, materials, and methods employed to produce castings in all the useful metals and their alloys, including brass, bronze, steel, bell, iron and type founding, with many original mixtures of recognized value in the mechanic arts. Also aluminum, plating, gilding, silvering, dipping, lacquering, staining, bronzing, tinning, galvanizing, britannia-ware, German silver, nickel, soldering, brazing, ores, smelting, refining, assaying, etc. By SIMPSON BOLLAND, Author of "The Iron Founder," "The Iron Founder" Supplement. 12mo.: cloth.....**$3.00**

The Pattern Maker's Assistant

Embracing lathe work, branch work, core work, sweep work and practical gear constructions, the preparation and use of tools, together with a large collection of useful and valuable tables. Sixth edition. By JOSHUA ROSE, M. E.; illustrated with 250 engravings; 324 pages: cloth.....**$2.50**

Modern Molding and Pattern Making.

A practical treatise upon pattern shop and foundry work. By JOSEPH P. MULLIN, M.E.: 257 pages; cloth; illustrated. **$2.50**

Iron and Steel Founding.

Illustrated with 39 diagrams. By C. WYLIE. Second edition, revised and enlarged; 324 pages; 8vo; cloth... .....**$2**

The Practical Brass and Iron Founder's Guide.

A treatise on brass founding, molding, the metals and their alloys, etc. By JAMES LARKIN, late conductor of the brass foundry department in the Penn Works, Philadelphia. A new revised and greatly enlarged edition. Contents: Among the most important and entirely new sections of this edition of this valuable and popular book are the following: Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to Other Metals; Casting Iron and Other Metals Upon Lace, Emoroideries, Fern Leaves and Other Combustible Materials; Some Modern Bronzes. In one volume; 12mo; 400 pages.....**$2.50**

American Foundry Practice.

Treating of loam, dry sand and green sand molding, and containing a practical treatise upon the management of cupolas and the melting of iron. By THOMAS D. WEST, practical iron molder and foundry foreman. Fully illustrated. Eighth edition, revised. 408 pages; cloth.....**$2 50**

The Iron Founder.

A comprehensive treatise on the art of molding, including chapters on core-making, loam, dry sand and green sand molding, also crystallization, shrinkage and contraction of cast iron and a full explanation of the science of pressures in molds, added to which are formulas for mixtures of iron, tables, rules and miscellaneous information. By SIMPSON BOLLAND. Illustrated with over 300 engravings. 12mo, cloth....**$2.50**

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings, wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. Illustrated with over 200 engravings; 400 pages; 12mo: cloth..... ...**$2.50**

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96-102 Reade St., - New York.

IS IT RIGHT?

Is it right to presume that the metal workers of America do not know the difference between common galvanized iron and good galvanized iron? We don't think so.

Would it be right to take advantage of that ignorance, even if it did exist? We don't think so.

Is it wise to conduct a business on that sort of a basis? We don't think so.

Taking advantage of other people's lack of expert knowledge is mighty poor business. Very few of us but have to take other people's words for things we are not wholly familiar with. Are we "fair game" for imposition because we depend on other folks' honesty? As a matter of fact, metal workers do know the difference between poor iron and good iron. They may be imposed upon once in a while because they believe in the dealer's honesty and do not watch him, but sooner or later they will find out the imposition, and then the dealer will be sure to lose their trade forever.

A dealer or manufacturer who sells inferior goods on the representation or with the understanding that they are first-class, is not a safe man to deal with. If he will sell a single sheet of iron that way, look out for him on a car load.

When we sell "Star Best Bloom," we guarantee it perfectly flat, full weight without variation, and absolutely true to gauge. It's the best grade of galvanized sheets we know how to procure. Doubtless, unscrupulous persons can occasionally sell inferior sheets at the price of the "Star." Doubtless they would make a little bigger profit on that one sale, but the big profits that result in lost trade are not so very profitable after all.

For a certainty of quality and an absolute guarantee of grades, address

MERCHANT & CO., Inc.,

PHILADELPHIA, CHICAGO, NEW YORK, BROOKLYN.

Hicks' Guide FOR Builders,

Comprising an easy, practical system of Estimating Materials and Labor for Carpenters, Contractors and Builders.

A comprehensive guide to those engaged in the various branches of the building trades.

By I. P. HICKS.

160 Pages, - 114 Illustrations.

Bound in Cloth, Price, - $1.00

This book presents to the trade, first, an easy, practical system of estimating materials, in concise form for reference. In the next place is given the average day's work of all kinds, and the average rates on which to figure in almost every detail of building construction.

Material and Labor, including Lumber, Carpentry Work Masonry, Plastering, Hardware, Painting, etc., are among the principal divisions These in turn are illustrated and ably treated under numerous sub-divisions, showing step by step the entire work of estimating, contracting and building, together with the best and most practical methods of doing the work.

This is followed by a section given to the Geometrical Measurements of Roof Surfaces, with numerous illustrations and examples. It embraces a new and simple system of framing curved roofs, also the simplest methods of roof framing of every description, with practical examples thoroughly illustrating nearly every conceivable form of roof and showing many points never before presented.

The volume also contains a chapter on Mitering Planceers, Moldings, etc., illustrating and describing how to make, in an easy, practical manner, many joints which are the source of no little trouble and annoyance on the part of the workman.

SENT POST-PAID BY

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade St., N. Y.

The Favorite Metal Shingle



EASTLAKE.

MONTROSS PATENT.

GOTHIC and DIAMOND TILE.

Unequaled for Beauty and Excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit, Mich.

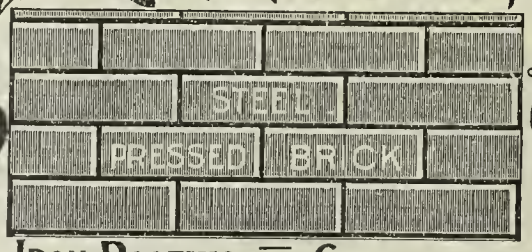
MONTROSS METAL SHINGLE CO., Camden, N. J.

E. VAN NOORDEN & CO., Boston, Mass

BEWARE! OF INFRINGMENTS.

..Purchase only the..

Genuine Pressed Steel Brick.



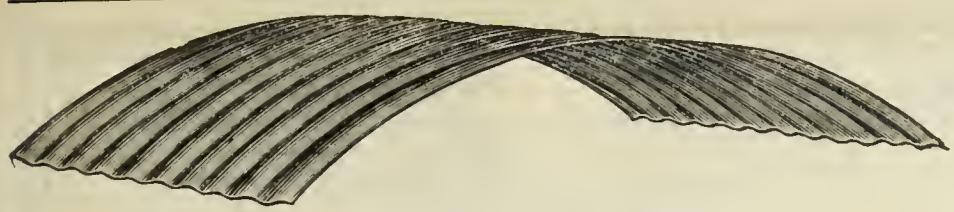
PATENTED APRIL 5th 1887.

Corrugated Steel CEILINGS



THE PENN IRON ROOFING AND CORRUGATING Co LIMITED.

For Catalogue, Samples and Prices. 23rd & HAMILTON Sts PHIL'A, PA. U.S.A.

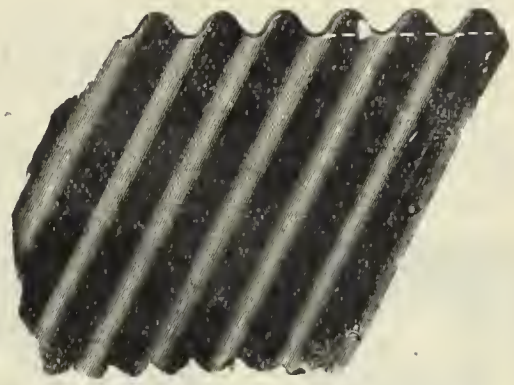


Curved and Corrugated

Sheets for Structural Purposes

Any size and dimension, ready for placing in position without trimming. Lightness, strength and durability insured at a minimum cost.

Such as
Houses,
Barns,
Factories,
Warehouses,
Granaries,
Sheds, Etc.



Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.



THE REAGAN
Metallic Shingle

is absolutely waterproof, is easily applied, will last a lifetime, and is the par-excellence of Metallic Shingles. Send for Circular and Prices.

The Cincinnati Stamping Co.,

Cincinnati, Ohio.

You can get everything in the line of Sheet Metal Goods from us.

PRICES WAY DOWN.

Steel Roofing, Corrugated Iron.

Galvanized Steel Eave Trough, Corrugated Expanding Conductor, Galvanized Cornice, Ornamental Crestings, Finials, Etc.

DOWN! DOWN! GO PRICES. WRITE US QUICK.

J. H. ELLER & CO., Office, 194 E. Fifth St., CANTON, OHIO.

Send for a descriptive circular, with sample pages, of the METAL WORKER PATTERN BOOK. Even if you are not ready to buy, you want to know just what kind of book it is and how it would help in your work. DAVID WILLIAMS, Publisher, 96-102 Reade Street, New York.

When Painting Roofs,
When Painting Stacks or Boiler Fronts,

use Dixon's Silica-Graphite Paint and you will never regret it. Roofs well painted have not required repainting in 10 to 15 years. Graphite paint is equally useful for wood or metal. Send for circulars.

OS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

USEFUL BOOKS.

Sheet Metal Worker's Instructor.

By R. H. WARN; illustrated by 32 plates and 37 woodcuts; 178 pages; 8vo, cloth, ...$3

The Tinman's Manual and Builder's and Mechanic's Handbook.

By J. R. BUTTS; 9th edition; illustrated; 204 pages; 12mo, cloth $1.25

The Tinsmith's Helper and Pattern Book.

With Useful Rules, Tables and Diagrams used by the Fraternity. By H. K. VOSBURGH; limp cloth.....$1

Workshop Companion.

By JOHN PHIN; 164 pages, 4⅓ x 6⅛ inches; boards, $0.30; also cloth, $0.60

Gas Fitting.

A practical handbook, treating of every description of gas laying and fitting. By J. BLACK; 121 illustrations; 130 pages; 12mo, cloth. ..$1

A Practical Workshop Companion for Tin, Sheet-Iron and Copper-Plate Workers.

Containing Rules for describing various kinds of patterns used by Tin, Sheet-Iron and Copper-Plate Workers. Practical Geometry. Mensuration of Surfaces and Solids; Tables of the Weights and Strengths of Metals and other Materials; Tables of Areas and Circumferences of Circles; Composition of Metallic Alloys and Solders, with numerous valuable receipts and manipulations for every-day use in the workshop. By LEROY J. BLINN; new, enlarged edition, 296 pages, cloth.....$2.50

Sent, post-paid, on receipt of price by

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade St., New York.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.

AMERICAN ROOFING CO.,

ST. LOUIS and CINCINNATI.

Mention this paper.



The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S.

FIRST & WASHINGTON STS. JERSEY CITY, N.J.

James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

MANUFACTURERS



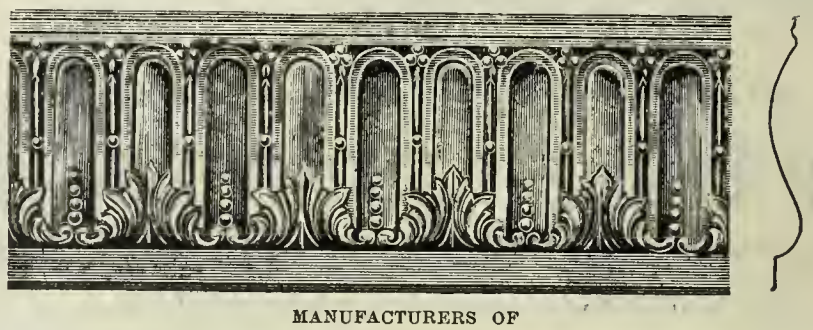
FOR

ROOFING AND SIDING.

Send for Circular and Prices.

Friedley & Voshardt,

194 and 196 Mather St., Chicago, Ill.,



MANUFACTURERS OF

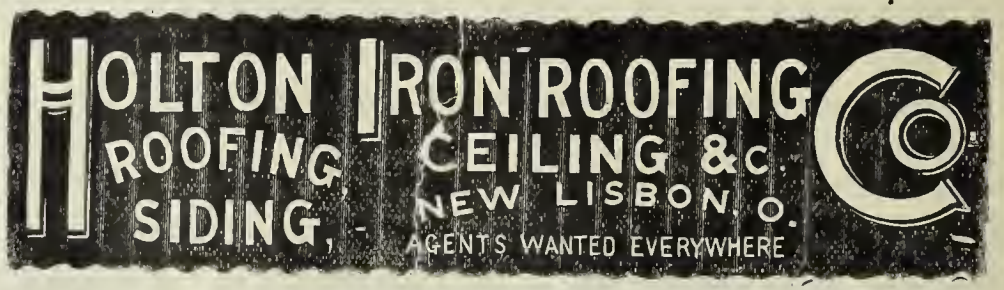
Sheet Metal, Zinc and Copper Ornaments

For Interior and Exterior Work, Steel Ceilings, Statuary, &c.

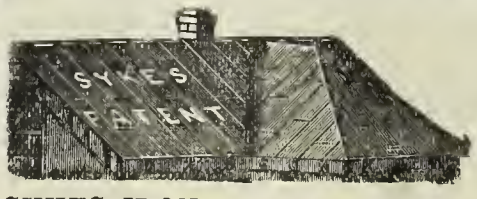
Send for our new 1894 Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.





JOHN SANBORN,
Dealer in Metals,
and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 WATER STREET,
Beekman Street, NEW YORK.



WORLD'S FAIR AWARD.

We are the only Steel Roofing Co. awarded Meda and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

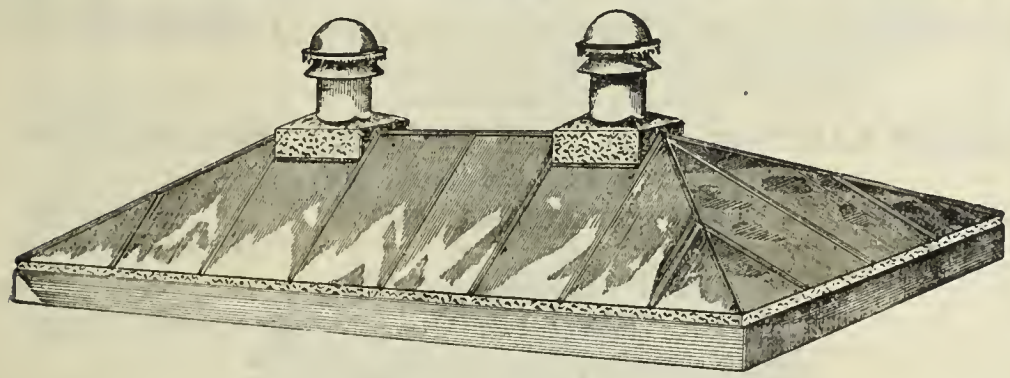
Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.





Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

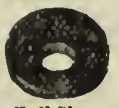
SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole



Full Size. CONCAVE.

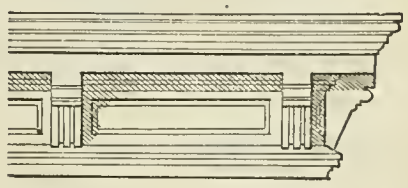
They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. **LITTLEFORD BROS.,** SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O

JAMES A. MILLER & BRO.,

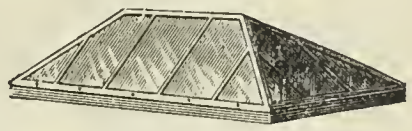
129 and 131 S. Clinton St., Chicago,

MANUFACTURERS

Galvanized Iron Cornices and Window Caps.



SHEET METAL SKYLIGHTS

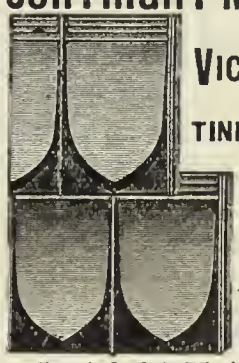


Owing to increased facilities (secured to enable us to fill our World's Fair contracts), we can make specially low prices on Skylights.

CORRUGATED { *Iron Roofing.* / *Conductor Pipes.*

See other Advertisement in this Paper.

CORTRIGHT METAL SLATES



and

VICTORIA SHINGLES

Made of

TINPLATE, (Full Weight Only)

Galvanized Steel

and

COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office, 134 Van Buren Street, Chicago.

Defy Fire and Time

WITH OUR

Steel Roofing,
Steel Ceilings, (Patented)
Corrugated Iron, Conductor Pipes,
Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,

Office and Works, Wheeling, W. Va.
Office and Warehouse, 471 Laflin St., Chicago.
Office and Warehouse, 81 Fulton St., New York.

DUGAN'S PATENT

SNOW GUARDS FOR SLATE AND OTHER STEEP ROOFS

SEND FOR ILLUSTRATED CIRCULAR & PRICE LIST

M. HALLIDAY,

SOLE PROPRIETOR AND MANUFACTURER.

218 EAST NINTH STREET, NEW YORK.

Architectural
Sheet Metal
Work.

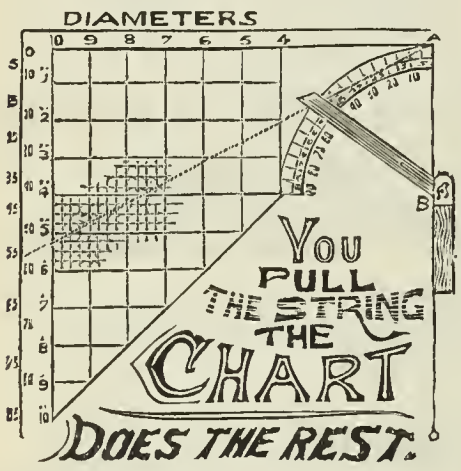
Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.



ELBOW PATTERN CHARTS.

Quick method. Easy to learn. Good to have. Over 1000 sold. 50c. by mail.

A. L. BURTIS, Lockport, N. Y.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York:

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds.

THE ROOT & BARRON
ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer.
PALMYRA, NEW YORK.

TINNERS' MACHINERY AND SUPPLY CO.,
SUCCESSORS TO
HIBBERD & SPINNER,

Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery, Presses, Dies and Can Makers' Tools.



FULL LINE OF SUPPLIES.

9 CLIFF STREET, NEW YORK CITY.

PATENT AUTOMATIC CAN BODY
SEAMERS.

COMBINATION
Presses and Dies,
SHEET METAL TOOLS, &c.

218 New St.,
W. J. GORDON, PHILADELPHIA, PA.

BANGOR EXCELSIOR SLATE COMPANY,
R. S. BROWN, Proprietor.
Miners and Manufacturers of
GENUINE BANGOR SLATE
Quarries at Bangor, Pa.
MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, EASTON, PA.

E. J. JOHNSON & Co.,
MINERS AND SHIPPERS OF
ROOFING SLATE.
OFFICE, 38 PARK ROW,
SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC.
QUARRIES, BANGOR, PA.
NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.
JOHN GALT & SONS.
MINERS AND WHOLESALE DEALERS IN
All KINDS of ROOFING SLATE.
253 BROADWAY, ROOMS 805 and 806, NEW YORK.
Prices given delivered at any R. R. Station in the United States.

SLATE
Kitchen Sinks,
Laundry Tubs,
Washstand Tops,
Marbleized Shelves,
Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,
In all Forms, also **Mantels.**
FAIRHAVEN, VERMONT
SEND FOR CATALOGUE.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and bookseller, 96-102 Reade St., New York.

— HE: "Why, I never have any sense when I'm in the company of a pretty girl."

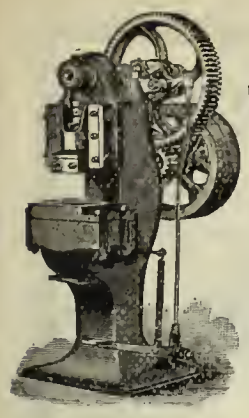
She: "What a queer way of paying me a compliment, Mr. Sappy!"—*Truth.*

— "I HAVE the dearest little surprise for my husband for Christmas."

"How perfectly lovely! What is it?"

"I'm not going to give him anything."

—*Chicago Inter Ocean.*



Power Punching Press.

NIAGARA

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

A FULL LINE.

THE BEST AND MOST IMPROVED

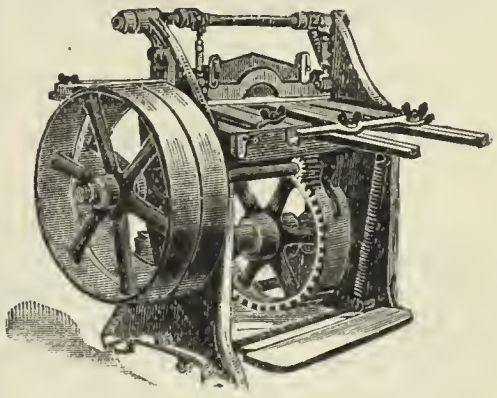
ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

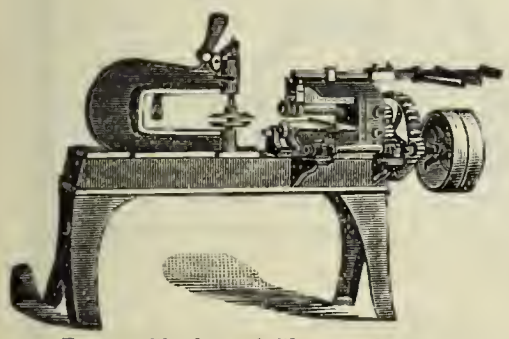
CORNICE MAKERS' TOOLS.

PRESSES AND DIES.

SQUARING, SLITTING and CIRCLE SHEARS.



Geared Power Squaring Shear.



Power Circle and Slitting Shear.

Complete Outfits for making Tinware, Cans and Other Sheet Metal Goods.

——MANUFACTURED BY——

THE NIAGARA STAMPING & TOOL CO.,

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**

FERRACUTE

MACHINE CO.,

Bridgeton, N. J., U. S. A.,

Manufacturers of

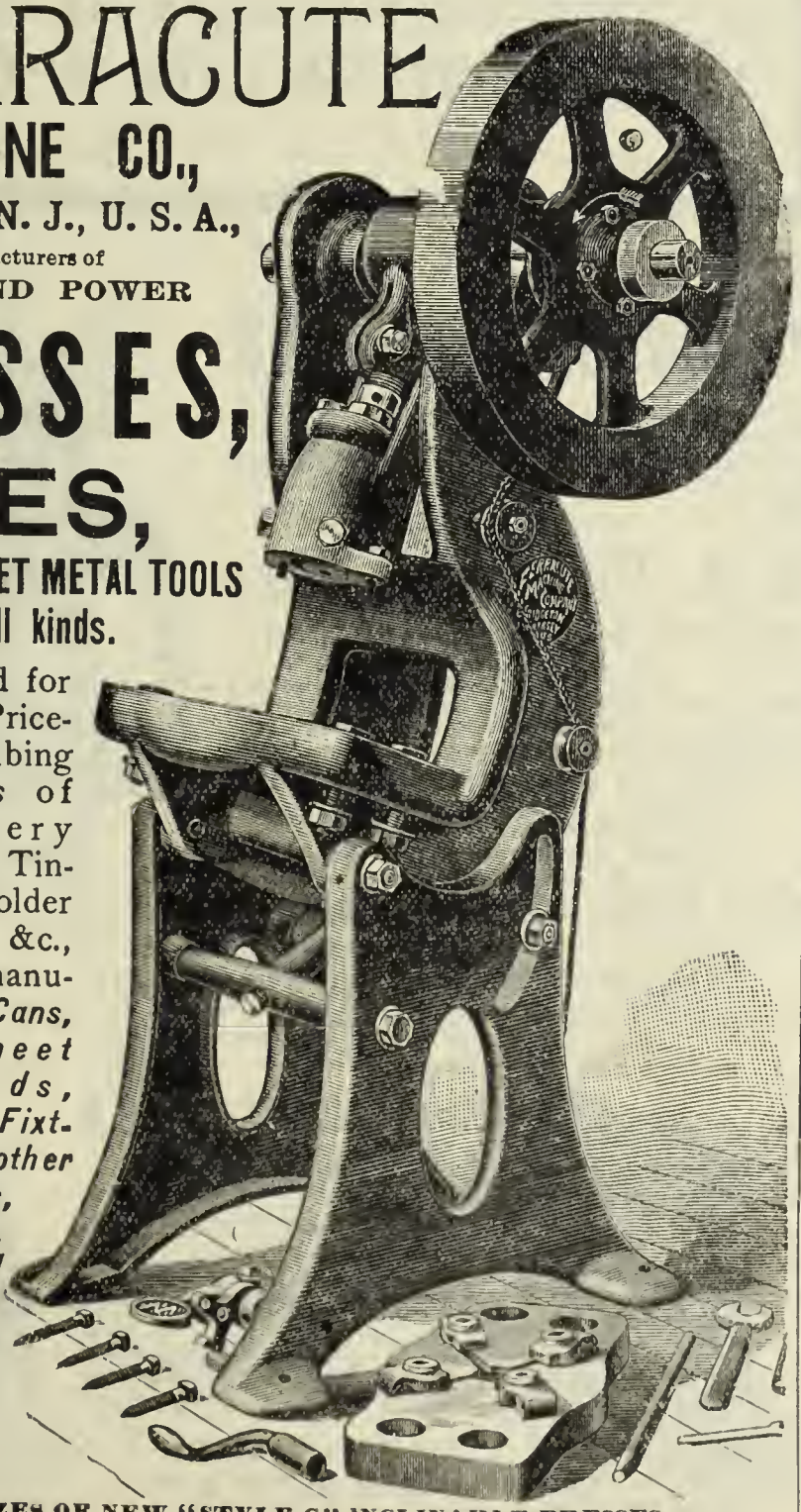
FOOT AND POWER

PRESSES,

DIES,

and other SHEET METAL TOOLS of all kinds.

Please send for Illustrated Price-Lists describing *300 kinds* of Presses, every kind of Dies, Tinners' Tools, Solder Apparatus, &c., for the manufacture of *Cans, Tinware, Sheet Iron Goods, Lamps, Gas Fixtures and other Brass Goods, Silver-ware, Hardware and other iron Goods of every kind.*



SIX SIZES OF NEW "STYLE O" INCLINABLE PRESSES, Heavy, Handsome, Durable and very Popular.

A Convenient Disease.

In the prohibition State of Kansas all the drugstores which have permits to sell intoxicating liquors are obliged by law to fill out certain printed applications stating the amount and kind of liquor purchased by each customer, and also the particular malady for which the liquor is bought. In many cities the drugstores have taken advantage of their permits to sell to the public for drinking purposes, practically turning the stores into saloons.

A recent temperance crusade has resulted in the conviction of several druggists who had violated the law. Several witnesses were called upon to testify as to the circumstances attending the sale of intoxicants. The county attorney put the following questions:

"You say you bought this liquor for medicinal purposes?"

"I did."

"You bought three bottles of beer on such a date?"

"Yes, sir."

"State to the court and jury the particular disease that required three bottles of beer as a medicine."

"General debility."

The next witness testified to having bought half a pint of whisky at the same store.

"And what was your disease?" asked the attorney.

"General debility."

A third witness swore that he had bought at the same place a pint of brandy.

"State to the court the particular malady that required the taking of a pint of brandy," said the prosecuting lawyer.

"General debility," replied the witness.

A titter went around the courtroom, and the county attorney, facing the jury, said gravely: 'Gentlemen of the jury, this is the first time I ever knew that 'general debility' was an epidemic and that either beer, whisky or brandy was an infallible remedy!"

The jury brought in a verdict of guilty without leaving their seats.—*W. J. Press.*

—Good clerks cannot counteract the effect of poor advertising, but good advertising sometimes makes up for poor clerks. —*Exchange.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

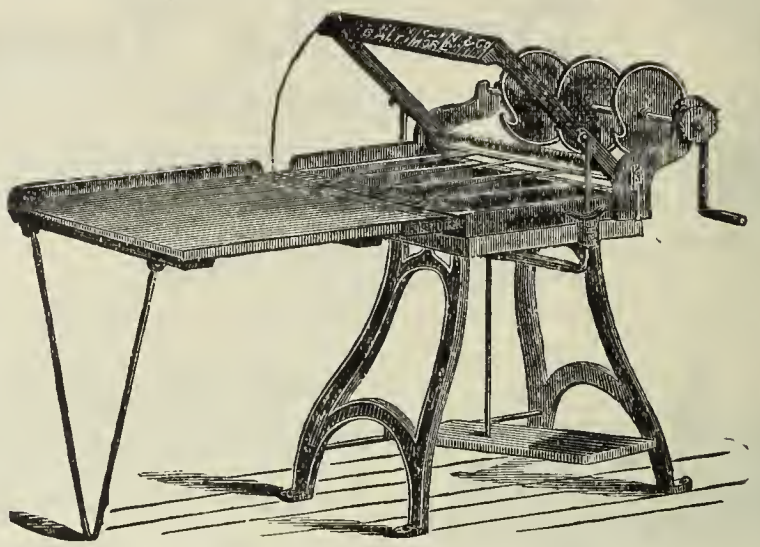
Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

First, for Rapidity of Work.
Second, for Quality of Work.
Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

LYON, CONKLIN & CO.,

Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.

—OUR—

PENDULUM PRESSES

are suitable for a wide range of work. Grooved beds with sliding bolts for holding all sizes of dies. Perfectly fitted balanced, and adjustable to light and heavy blows. A first-class machine in every respect.

MANUFACTURED BY

G. A. Crosby & Co.,

176 & 178 So. Clinton St., CHICAGO, ILL., U. S. A.,

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap and Boiler Makers, and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Wire Goods, Brass Goods and all Hardware Novelties.**

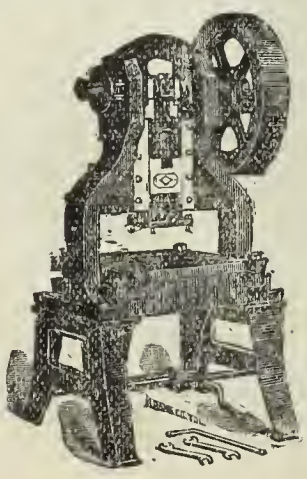


Special Attention to Dies of every Description.

WORK GUARANTEED THE BEST.

Write for Prices and Our New 200-Page Catalogue.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.



The Toledo Machine & Tool Co.,

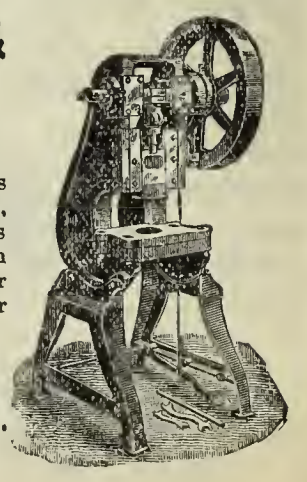
MANUFACTURERS OF

Power Punching Presses, Drop Presses Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

Send for Catalogue now being Printed.

The Toledo Machine & Tool Co.

Superior and Oak Sts., Toledo, O.



ALPHABETICAL LIST OF ADVERTISERS.

Acme Roofing Co..... 26
Ætna Standard Iron & Steel Co..... 81
Allen's Corrugating Wks... 82
American Boiler Co..... 19
American Radiator Co..... 1
American Roofing Co..... 86
American Sheet Iron Co..... 79
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 75
Auld & Conger..... 78
Aurora Vapor Stove Co..... 13
Bailey-Farrell Mfg. Co..... 74
Bangor Excelsior Slate Co.. 88
Barstow Stove Co..... 96
Bascom, H. Clay.. 69
Belden, F. E. Mica Mining Co..... 27
Belding Mfg. Co .....28&29
Bellaire Stamping Co..... 65
Berger Bros..... 78
Berger, L. D..... 86
Bibb, B. C. Stove Co..... 23
Black Diamond Tin Plate Works..... 86
Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 26
Bowen Mfg. Co..... 30
Bowers, Galpin & Co..... 77
Braner, A. G..... 39
Bridgeport Crucible Co..... 68
Brombacher's Sons, Jacob.. 95
Bronson Supply Co..... 67
Bruce & Cook.....83&96
Buffalo Register Works..... 26
Burgess Soldering Furnace Co..... 72
Burtis, A. L..... 88
Burton, W. J. & Co..... 84
Caley, Ed. L..... 69
Calvert, P. B. & Co..... 81
Cambridge Iron & Steel Co.. 80
Canfield, H. O..... 76
Canton Steel Roofing Co.... 88
Carton Furnace Co..... 3
Central Oilgas Stove Co.... 14
Central Pattern Works..... 69
Central Stamping Co..... 63
Chamberlain, J. W. Co..... 75
Cheney, S. & Son..... 68
Chicago & Erie Stove Co..18&20
Cincinnati Corrugating Co.. 85
Cincinnati Stamping Co..... 85
Clad, V. & Sons..... 65
Clark, G. M. & Co..... 12
Clark Novelty Co..... 74
Clark, Quien & Morse..... 77
Clayton & Lambert Mfg. Co. 70
Clough, R. M 91
Columbia Refrigerator Co.. 39
Colwell Lead Co..... 77
Cooney, Selner & Co..... 77
Cope, Geo. W..... 69
Corning Mfg. Co. 23
Correspondence School of Mechanics..... 62
Cortright Metal Roofing Co. 87
Covert Mfg. Co..... 64
Craig-Reynolds Fdy. Co..... 20
Crosby, G. A. & Co..... 90
Curtis & Curtis..... 74
Dalton-Ingersoll Co..... 72
Day Mfg. Co..... 73
Dayton Mfg. Co..... 15
De Haven & Co..... 18
Deming Co..... 74
Dixon, Jos., Crucible Co..... 85
Douglas, W. & B..... 74
Dover Machine Works..... 91
Dunlap, John Co..... 81
Eckstein, Chas. G. & Co..... 94
Eddy Electric Mfg. Co..... 70
Electric Boiler Co..... 23
Eller, J. H. & Co..... 85
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 88
Ferracute Machine Co..... 89
Ferrosteel Co..... 16
Fostoria Steel Roofing Co... 87
Frink, I. P..... 96
Friedley & Voshardt..... 86
Froelich, A., Estate of..... 68
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 88
Garry Iron & Steel Roofing Co..... 87
Gender & Paeschke Mfg. Co. 66
Globe Iron Roofing & Corrugating Co..... 87
Globe Ventilator Co..... 69
Gobeille Pattern Co..... 69
Gordon, W. J..... 88
Gorton & Lidgerwood Co..... 1
Graff & Co..... 20
Greene, W. F..... 27
Griswold Mfg. Co..... 27
Gummey, Spering & Co..... 79
Gurney Heater Mfg. Co..... 19
Gurney Refrigerator Co..... 31
Halliday, M..... 87
Hanson & Van Winkle Co... 70
Harrison, W. P. & Co..... 66
Hart & Crouse..... 21
Hartford Hollow Ware Co.. 66
Haslet, Flanagen & Co..... 31
Hess, Snyder & Co..... 25
High land Foundry Co..... 1
Highton, Wm. & Sons..... 26
Holton Iron Roofing Co..... 86
Howard Furnace Co..... 32
Howard Thermostat Co..... 26
Howson & Howson..... 62
Hull, M. L..... 73
Illinois Refrigerator Co..... 30
Illinois Zinc Co..... 83
Iwan Bros..... 68
Jackson's Sons, W..... 26
Jenkins Bros..... 1
Jersey City Galvanizing Co. 75
Johnson, E. J. & Co..... 88
Kanneberg Roofing Co..... 76
Kansas City Metal Roofing & Corrugating Co..... 80
Keen & Hagerty..... 63
Keene, Geo. C. & Co..... 91
Kelly, Thos. & Bro..... 72
Kemp, C. M. Mfg. Co..... 78
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 61
Kewanee Boiler Co..... 22
Kieckhefer Bros. & Co..... 63
Kieley, T..... 1
Kilbourne & Jacobs Mfg. Co. 71
Lawrence-Letts Elbow Co... 77
Lightning Dasher Egg Beater Co..... 66
Lindemann, A. J. & Hoverson Co..... 10
Littleford Bros..... 87
Lyon, Conklin & Co..... 90
McDaniel & Harvey Co..... 83
McLain, J. H. Co..... 19
McLaughlin, J. K..... 69
Mahony, M..... 22
Marcy Stove Repair Co..... 68
Marlin & Co..... 77
Marston, I. G. & Co..... 76
Mason Regulator Co..... 1
Merchant & Co., Inc.....78&84
Merry, Geo. E..... 81
Meurer Bros. Co..... 82
Mica Mfg. Co..... 27
Michigan Stove Co..... 17
Michigan Vapor Stove Co... 15
Millar, Chas. & Son..... 96
Miller, Jas. A. & Bro.....76,86&87
Miner & Peck Mfg. Co..... 94
Monarch Stove Co..... 8
Montross Metal Shingle Co.. 84
Mt. Penn Stove Works..... 16
Mowry, W. C..... 23
Mullins, W. H..... 87
Munsell, E. & Co..... 27
Myers, F. E. & Bro..... 74
National Wringer Co..... 66
Newark Regulator Co..... 73
New Castle Steel & Tin Plate Co..... 79
New Haven Heating & Plumbing Co..... 19
New York Central Iron Wks. 24
New York Elbow Co..... 66
New York Iron Roofing & Corrugating Co..... 86
New York Nickel Plating & Mfg. Co..... 65
Niagara Stamping & Tool Co. 89
Niles Mfg. Co..... 75
Obdyke, W. A. & Co..... 76
Obermayer, S. Co..... 68
Ohl, Geo. A. & Co 94
Osborn, J. M. & L. A..... 71
Ostrander, W. R. & Co..... 30
Packard Enameling Co..... 26
Page Boiler Co., Wm. H..... 21
Palermo Mica Co..... 25
Pancoast, Henry B. & Co.... 75
Paxson, J. W. & Co..... 68
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 74
Peck-Williamson Heating & Ventilating Co..... 4
Penn Iron Roofing & Corrugating Co..... 84
Phelps, Dodge & Co..... 80
Phillips Tin Plate Co..... 79
Pontyminster Old Style Ternes..... 80
Poorman Mfg. Co..... 95
Portsmouth Stove & Range Co..... 24
Presbrey Stove Lining Co... 69
Proudman Bros..... 76
Puffer, W. E..... 27
Putnam Foundry & Machine Co..... 21
Rathbone, Sard & Co..... 9
Republic Iron Works, ... 82
Ringen Stove Co..... 2
Robinson, J. M. & Co..... 95
Rochester Stamping Wks.... 65
Rome Mfg. Co..... 67
Root, A. L..... 88
Rutland Fire Clay Co..... 69
St. Louis Corrugating Co.... 82
St. Louis Stamping Co..... 67
S S. S. Condnotor Co..... 77
Salem Nail Co..... 88
Sanborn, John..... 36
Sandwich Novelty Co..... 31
Saunders' D. Sons..... 73
Savill, Walls & Co..... 75
Sayre Stamping Co..... 27
Schaffer, J. P..... 22
Schneider & Trenkamp Co.. 11
Sheppard, Isaac A. & Co..... 1
Silver & Co 67
Sims Mfg. Co. .....
Smith & Winchester Co..... 21
Smith Co., H. B..... 24
Smith, J. D. Foundry Supply Co..... 69
Souther, E. E. Iron Co..... 80
Special Notices..... 62
Sperry, D. R. & Co..... 6
Stamford Foundry Co..... 25
Standard Lighting Co..... 6&7
Star Coupler Co..... 22
Star Mfg. Co.....
Stebbins, E. Mfg. Co..... 76
Steel Clad Bath Co..... 72
Stellwagen & Kynoch..... 25
Stiles & Parker Press Co.... 94
Stocking, H. B..... 62
Stuart & Peterson Co..... 73
Sykes Iron & Steel Roofing Co 86
Taplin, Rice & Co..... 18
Tarbox Mfg. Co..... 68
Taylor Co., N. & G..... 96
Tinners' Machinery & Supply Co..... 88
Tinplate Decorating Co..... 80
Toledo Machine & Tool Co.. 90
Troy Nickel Works..... 31
Tuerk Water Meter Co..... 94
Tuttle & Bailey Mfg. Co..... 26
United States Heater Co....
Valentine, M. D. & Bro. Co... 69
Van Noorden, E. & Co..... 84
Vedder Pattern Works..... 69
Vogel, William & Bros..... 66
Walther & Christman..... 78
Washburne, E. G. & Co..... 69
Weathered's, Thos. W. Sons 15
Western Stove & Mfg. Co.. 10
Wheeling Corrugating Co... 87
White Mountain Freezer Co. 64
Wisconsin Refrigerator Co.. 30
Wister, L. & R. & Co..... 96
Wolff, L. Mfg. Co..... 71
Wood, Alan Co..... 80
Wood Co., W. Dewees..... 96
Yates & Co..... 62
Zero Valve Co..... 73
Zucker, Levett & Loeb Co... 70

STOVE AND RANGE MAKERS'

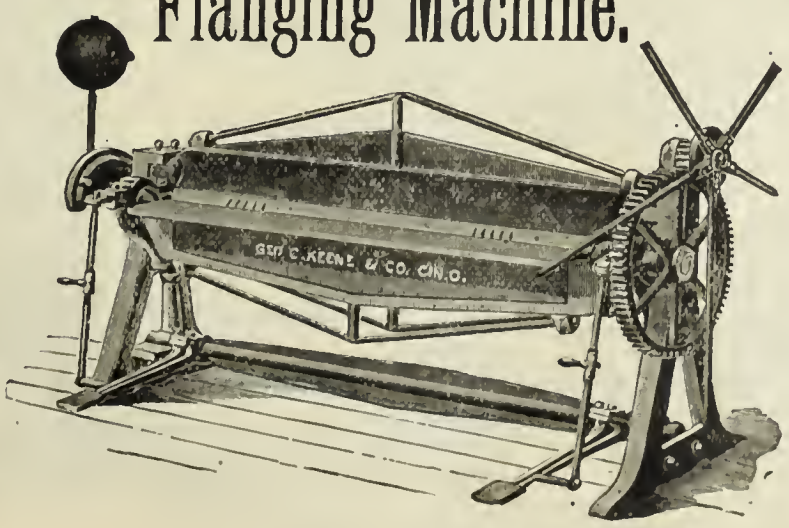
Machinery for the Production of Iron Roofing a specialty.

Geo. C. Keene & Co.,

CINCINNATI, OHIO,

Makers of the Keene Cornice Brake.

Flanging Machine.



PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

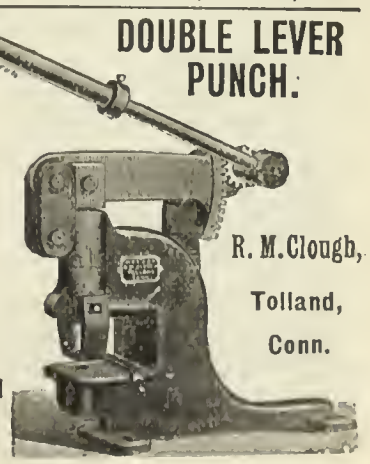
Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS., Dover, Del.

DOUBLE LEVER PUNCH.

Capacity, ½ in. hole in ¼ in. Iron.

Send for Circular and Price.



R. M. Clough, Tolland, Conn.

CLASSIFIED LIST OF ADVERTISERS.

Architectural Ornaments.
Friendley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plug .
Canfield H. O., Bridgeport, Conn,

Bathtubs.
Day Mfg. Co., Detroit, Mich.
Peck Bros., & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St.. N Y.
Stuart & Peterson Co., Phila., Pa,

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers Tools and Machines.
Bliss E. W. Co., Brooklyn, N. Y.
Crosby G. A. & Co., Chicago, Ill.
Dover Machine Works. Dover. Del.
Ferracute Machine Co., Bridgeton, N.J
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y

Castings.
Cheney, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing Co., Canton. O.
Allen's Corrugating Works, Chicago, Ill.
Berger Bros., Philadelphia, Pa.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton. Ohio.
Lawrence Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A., & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Ferracute Machine Co., Bridgeton, N.J
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Corrugating Works, Chicago, Ill.
Burton, W. J. & Co.. Detroit. Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro. Chicago, Ill.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cuspidores.
Rochester Stamping Works, Rochester, N. Y.

Cut-Offs, Rain-Water.
Cooney, Selner & Co. Indianapolis,
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
E. W. Bliss Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct

Eave Troughs.
Berger. L. D., Philadelphia, Pa.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Mfg. Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Clark, Quien & Morse, Peoria, Ill
Proudman Bros., Meriden, Conn.
Walther & Christman, Cleveland, O.

Egg Beaters.
Lightning Dasher Egg Beater Co., Toledo, Ohio.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor. Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand St., New York.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Flour Bins and Sifters.
Geuder & Paeschke Mfg. Co., Milwaukee. Wis.

Foundry Facings, Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati. O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N, Y.
Schaffer. Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence. R. I.
Bibb, S. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning. N. Y.
Craig-Reynold Foundry Co., Dayton Ohio.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J F. Furnace Co., Syracuse, N.Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati. O.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Conn.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Hull, M. L., Cleveland, O.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis. Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Groovers.
Tuerk Water Meter Co., Fulton, N. Y.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.
Packard Enameling Co., Warren, O.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y
Poorman Mfg. Co., Canton, Ohio.

Heater Regulators.
Buffer W. E., 8 Peck Slip, N. Y.

Heaters, Steam and Hot-Water.
American Boiler Co., Chicago, Ill.
Barstow Stove CO. Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Fuller & Warren Co., Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y,
Kewanee Boiler Co., Kewanee. Ill.
McLain, J. H. Co., Canton, Ohio.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New Haven Heating & Plumbing Co., New Haven, Conn,
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Putnam Foundry & Machine Co., Putnam Conn.
Smith Co., H. B. 137 Centre St.. N. Y.
Smith & Winchester Co., Boston, Mass
United States Heater Co., Detroit, Mich
Weathered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie. Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Stuart & Peterson Co., Philadelphia, Pa.

Hollow Ware, Aluminum.
Griswold Mfg. Co.. Erie, Pa.
Silver & Co., Brooklyn, N. Y.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Ice Cream Freezers.
White Mountain Freezer Co., Nashua, N. H.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa
Cincinnati Corrugating Co., Piqua. O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co. Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Gender & Paeschke Mfg. Co., Milwaukee. Wis.

Lacquers and Japans
Hanson & Van Winkle Co., Newark, N. J.

Lamp Stoves and Heaters.
Central Oilgas Stove Co., Boston, Mass

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 89 Fulton St., N. Y.

Molding Sand.
Obermayer, S. Co., Cincinnati, Ohio.
Smith, J. D., Foundry Supply Co., Cincinnati. Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating and Mfg. Co., 227 and 229 West 29th St.. N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand Street. New York.

Oil Cans.
Central Oilgas Stove Co., Boston. Mass
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Pattern Charts,
Burtis, A. L., Lockport, N. Y.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Caiely, Edw. L., Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, Jno. K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven. Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa
Canfield, H. O., Bridgeport. Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Heurle Mfg. Co., Xenia. O.
Hull, M. L., Cleveland, O.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walis & Co., Phila., Pa.
Star Coupler Co., St. Louis, Mo.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Wolff. L. Mfg. Co., Chicago, Ill.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher
Vogel, Wm. & Bros., 37 to 47 S. Brooklyn.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover. Del.
Ferracute Machine Co., Bridgeton, N. J.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven Conn.
Peck, Stow & Wilcox Co., 27 Chambers St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 45 Vesey St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water
American Radiator Co., Chicago, Ill.
Exeter Mch. Works, Boston, Mass.
Gurney Heater Mfg. Co. Boston, Mass,
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl Street, N. Y.

Refrigerators.
Belding Mfg. Co., Belding, Mich.
Bower Mfg. Co., Fond du Lac, Wis.
Columbia Refrigerator Co., Northville, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.
Illinois Refrigerator Co., Chicago, Ill.
Wiscousin Refrigerator Co., Eau Claire Wis.

Registers.
Buffalo Register Works Buffalo, N. Y.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St. N. Y
Silver & Co., Brooklyn, N. Y.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel Corrugated and Plain.
Acme Roofing Co., Canton, O.
American Roofing Co., Cincinnati, O.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, Ohio.
Globe Iron Roofing & Corrugating Co., Cincinnati. O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing and Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
Souther, E. E. Iron Co., St, Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago. Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Lyon, Conklin & Co., Baltimore, Md.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

SEE ALPHABETICAL INDEX, PAGE 91.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover, Del.
Ferracute Machine Co. Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co. Toledo, O.
Tuerk Water Meter Co., Fulton, N. Y.

Shingles and Tiles, Metallic.
Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co. Cincinnati, O
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Wolff, L. Mfg. Co., Chicago, Ill.

Skate Sharpeners.
Sandwich Novelty Co., Sandwich, Ill.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.

Slater's Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Patterns.
Bascom, H. Clay, Troy, N. Y.
Caley, Edw. L., Philadelphia, Pa
Central Pattern Works, Dayton, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son., Manlius, N. Y.

Stove Repairs.
Braner, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., City.
Troy Nickel Works Troy, N. Y.

Stove Trucks.
Stellwagen & Kynoch, St. Ignace, Mich.

Stoves and Ranges.
Bibb, B. C., Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
Clad, V. & Sons, Philadelphia, Pa.
DeHaven & Co., Pittsburgh, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co, Boston, Mass
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Stamford Foundry Co., Stamford, Conn.
Taplin, Rice & Co., Akron, O.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Lindemann, A. J & Hoverson Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.
Aurora Vapor Stove Co., Cleveland, O.
Barstow Stove Co., Providence, R. I
Central Oilgas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill.
Dayton Mfg. Co., Dayton, Ohio.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Mich. Vapor Stove Co., Grand Rapids, Mich.
Monarch Stove Co., Mansfield, Ohio.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Western Stove and Mfg. Co., Milwaukee, Wis.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Telephones
Harrison, W. P. & Co., Columbus, O.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Black Diamond Tin Plate Wks., Phila., Pa.
Bruce & Cook, 186 to 190 Water St. N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Dunlap, John Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila., Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., N. Y.
Gender & Paeschke Mfg. Co., Milwaukee, Wis.
Keen & Hagerty, Baltimore, Md.
Kleckhefer Bros. & Co., Milwaukee Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Berger, L. D., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N. Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, George A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., Cliff St., N. Y.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - -	$1.00	SIX MONTHS, - - - - - -	$22.10
ONE MONTH, (5 Times.) - - - -	5.00	ONE YEAR, - - - - - - -	40.30
THREE MONTHS, - - - - - -	12.35		

RATES FOR LARGER SPACES QUOTED ON APPLICATION.

DAVID WILLIAMS, Publisher,

96, 98, 100 and 102 Reade Street, NEW YORK. **59 Dearborn Street, CHICAGO.**

New York (Main Office), - - - -	96-102 Reade Street. - - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - - -	220 South Fourth Street, - - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - - -	Room 509, Hamilton Building, - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - - -	59 Dearborn Street, cor. Randolph, - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - - -	Rooms 22-24 Pickering Building, - - -	HENRY SMITH, Manager.
St. Louis, - - - - - - - -	Bank of Commerce Building, - -	H. H. ROBERTS, Manager.
Boston, - - - - - - - -	146 Franklin Street, - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - - -	312 The Cuyahoga, - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon St., London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A., The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

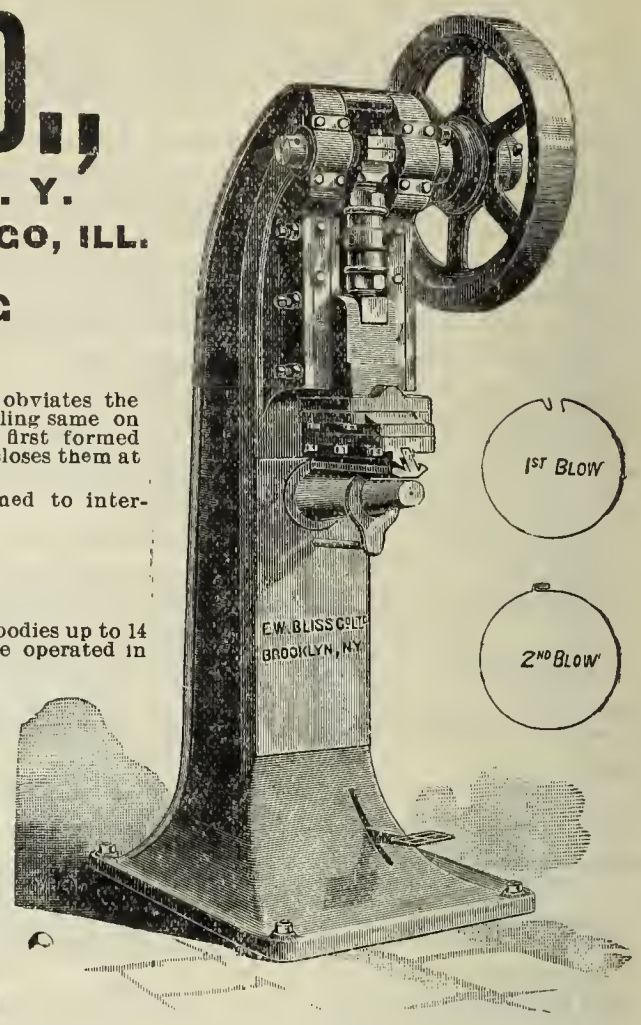
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.



PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

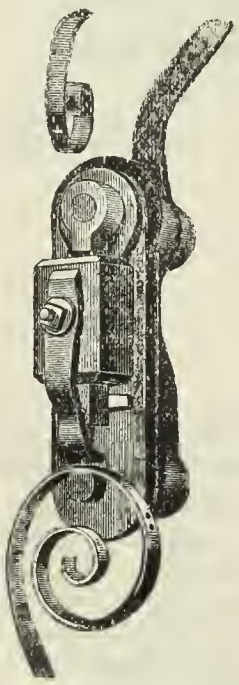
DIES, SPECIAL MACHINERY &c.

THE STILES & PARKER PRESS CO.

CHAS. G. ECKSTEIN & CO.,

45 Vesey St., New York.

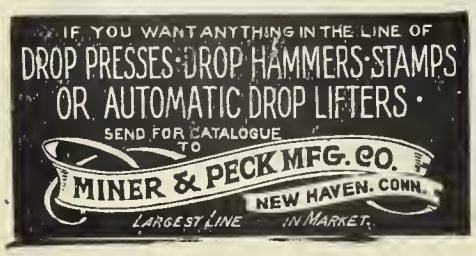
Punches and Shears, Wrought Iron Ornaments, Mouldings, Rosettes, Fence Pickets, etc.



Compact Form, Simplicity, Durability.

Best Workmanship, Few Parts, Low Price.

SEND FOR CIRCULAR.

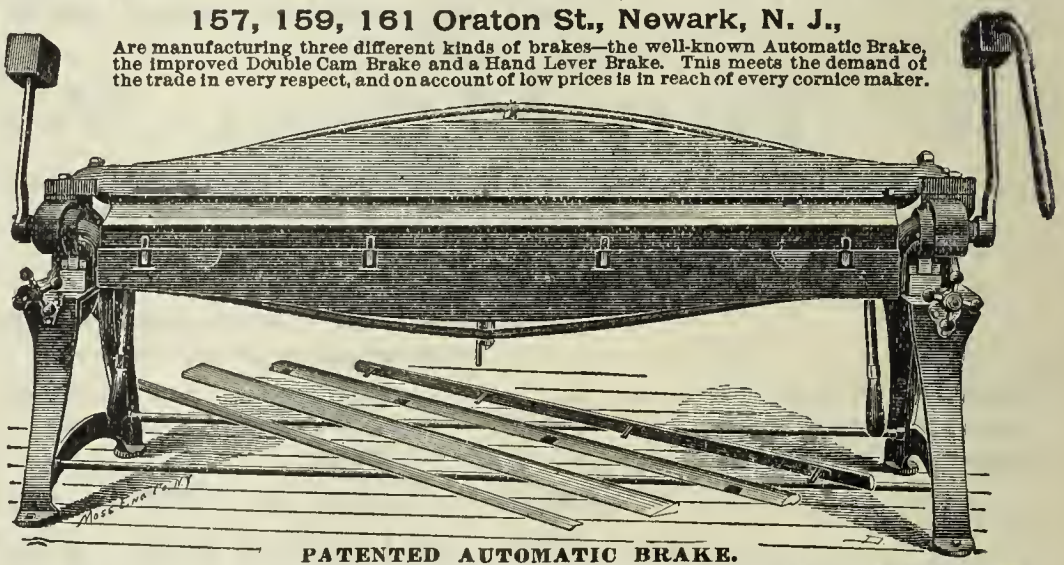


GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co.,

157, 159, 161 Oraton St., Newark, N. J.,

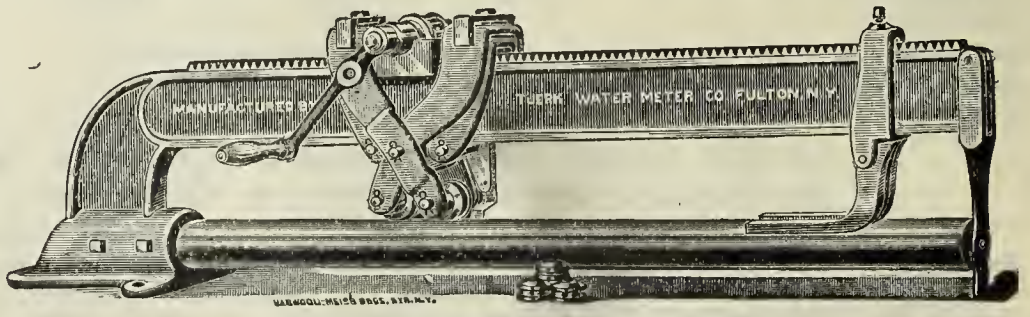
Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

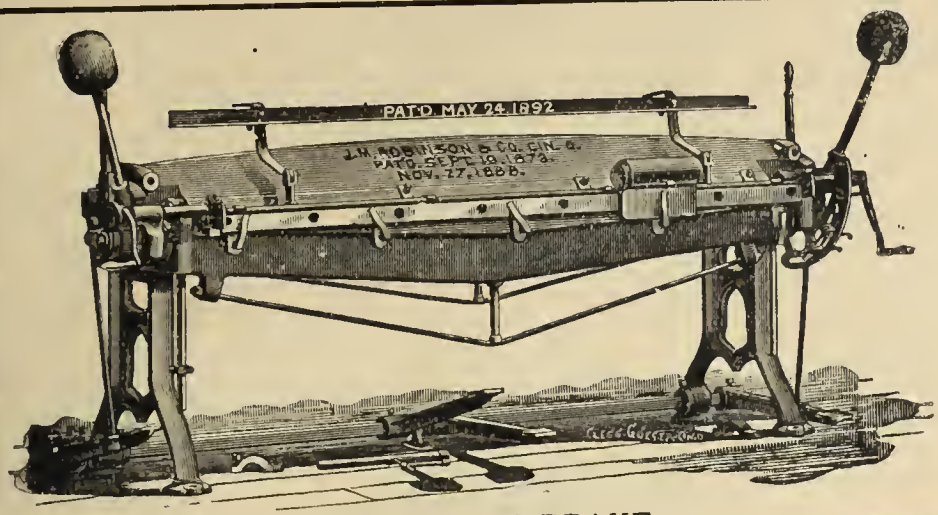
We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892 Send for our illustrated catalogue.

TUERK WATER METER CO.'S GROOVER.



SEND FOR CIRCULAR.

Manufactured by **TUERK WATER METER CO., Fulton, N. Y.**

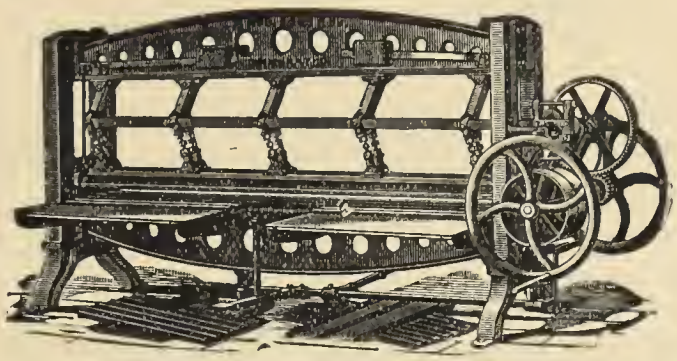


THE "GLOBE" CORNICE BRAKE.

With which to form Sheet Metal into Cornice Mouldings, Ridge Caps, Skylight Bars; and with Beader and Gutter Former attached to Brake (price of which is extra), Bead and Form Gutters. Cornice manufacturers' Steel Straight Edges, 30 inch to 10 foot lengths.

ROOFING MACHINE.

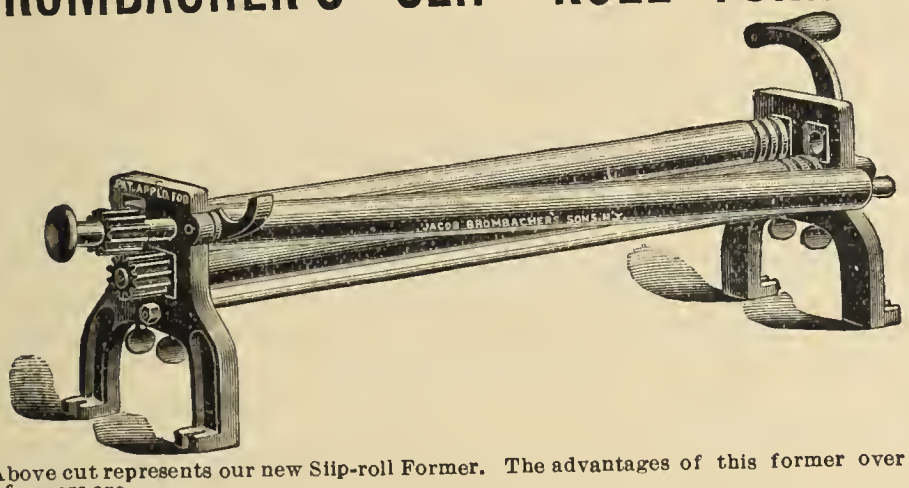
With Dies suitable, will form Sheet Metal Roofing, Siding, Ceiling, Weather-Boarding, Skylight Bars, Metal Lathing, Gutters, Ridge Caps, Escalloped Steel Sheets and Cattle Troughs.



J. M. Robinson & Co., Mfrs.,

225-229 W. Second St., Cincinnati, Ohio, U. S. A.

BROMBACHER'S SLIP ROLL FORMER.



Above cut represents our new Slip-roll Former. The advantages of this former over ordinary formers are

First, that the rollers are made of cold rolled steel rolls.

Second, it has cut gears with consequent smoothness of operation.

Third, the thumb screws are inserted from underneath, consequently the box carrying the rollers rests on the screws instead of the screws carrying the boxes and rollers; this obviates the possibility of breaking thumb screws.

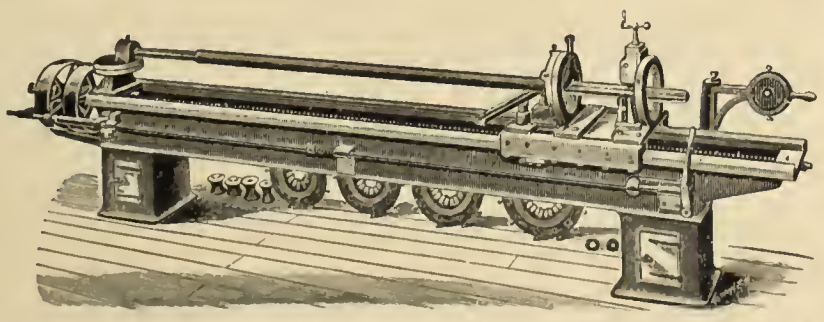
Fourth, we do not have to split one frame in order to obtain the slip-roll mechanism, and we therefore have all the rigidity of ordinary formers with all the convenience of slip-roll formers.

Above design makes the smoothest and quickest operating and stiffest Former on the market and they are sold at the price of ordinary Stove Pipe Formers.

JACOB BROMBACHER'S SONS - - No. 30 Cliff St., N. Y. City.

Established 1833 Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

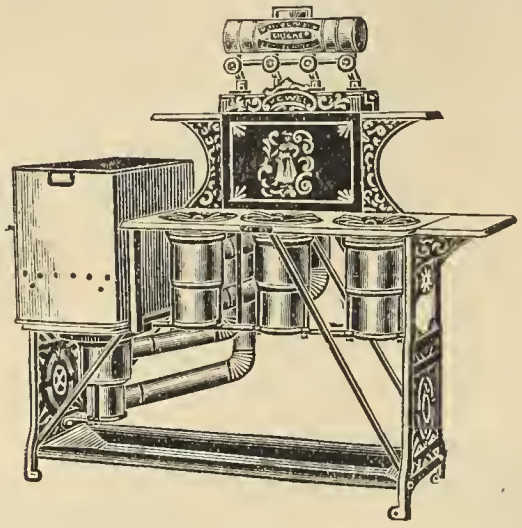
Sent, postpaid on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96 - 102 Reade Street, - New York.

Gasoline Stoves! Gasoline Stoves!



We have the **Dangler New Gem** Vapor Stove.
" **Jewel Safety** "
" **Bay State Safety** "

It is useless for us to expound the merits of these stoves for you all know they are positively without a fault and **we guarantee every stove sold.**

BUT!

Are you aware that if you handle the **New Gem** or **Jewel Safety** that you avoid all competition, as none others have burners like them?

AND

you realize that if you want the agency for these stoves you must

ORDER SAMPLES NOW?

We have them in all styles and sizes.

BARSTOW STOVE COMPANY,

Manufacturers of

"Bay State" Furnaces. Ranges. **"Bay State"** Stoves. Gas Ranges.

BOSTON. PROVIDENCE, R. I. NEW YORK.

Why not keep before you special circulars and prices of our goods?

A FULL STOCK

IS ALWAYS CARRIED AT OUR

NEW YORK OFFICE,

231 WATER STREET.

N. & G. TAYLOR CO.,

Manufacturers of Tinplate,

PHILADELPHIA.

ESTAB. 1857



The Great CHURCH LIGHT. Frink's Patent Reflectors for Gas, Oil or Electric, give the most powerful, softest, cheapest and best light known for Churches, Stores, Banks, Theatres, Depots, &c. New and elegant designs. Send size of room. Get circular and estimate. A liberal discount to churches and the trade. *Don't be deceived by cheap imitations.* **I. P. FRINK, 551 Pearl St., N. Y.**

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COO

TINNERS' TOOLS and MACHINE

TINNERS' SUPPLIE

186, 188 & 190 Water Street,
248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HO

By far the best Spout made. Greatly proved this season. More used every year all others combined. Sold by leading jo everywhere, and to them by

CHARLES MILLAR & SON, Utica,

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPAN

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRO

PATENTED:

December 10th, 1878.
January 10th, 1882.
January 1st, 1884.
February 12th, 1884.
March 4th, 1884.
April 15th, 1884.
June 10th, 1884.
January 6th, 1885.
August 31st, 1886.
January 1st, 1889.
January 17th, 1893.

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. A WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh, Pa.

The Metal Worker Essays on House Heatin by Steam, Hot Water and Hot Air.

WITH INTRODUCTION AND TABULAR COMPARISONS.

Second edition, revised. To which has been added a selection fr the Letters of Criticism on the Essays as originally published in T METAL WORKER and a chapter on Proportioning Radiating Surfaces.

How to Effectively and Economically Heat a Given Building

is a problem of the highest importance to the Architect, Builder and Owner. Shall stea water or air be employed as a medium? What are the relative merits of the differe systems? By what means can a comparison be instituted that will show their respecti advantages?

The essays comprised in this volume are some of the results of a prize contest conduct by *The Metal Worker* some time since. They include the prize essays and selections fr the best of the others. The foundation of all the essays is a house, the floor plans a elevations of which were the result of previous competitions conducted by *Carpentry a Building*. The elevations and the plans of this house were carefully printed on separa sheets adapted to receive at the contestants' hands lines indicating the position of heat runs of pipes, location of radiators, etc., thus insuring a uniformity in presentation, a also holding the competitors to exactly the same conditions. The result, therefore, i book in which are shown: First, different means of heating the same house, among whi may be instituted various comparisons, and, second, several different interpretations each of the several methods, among which also instructive comparisons may be institute

The work is not a mere theoretical consideration of principles and a statement of fa gained by inquiry in the trade; but, instead, a collection of essays by practical men, ea showing how one man would go about heating the building in question, using the mea with which he is best acquainted in practice. Features of the book which are not the les important among its numerous merits are the *lists of items and statement of cost* a companying the different essays. Never before in the history of the heating trades has the been offered such a collection of information directly from the practice of those who a actively engaged in the heating business as is contained in this volume.

"The whole forms a valuable and instructive exposition of current practice house heating."—*American Machinist.*

"Covers the ground very completely."—*Scientific American.*

"It will be found as complete a compendium as possible of existing informatio on this subject, amply illustrated by drawings."—*The Sanitary Era.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we only had the information contain in this volume in earlier life, we could now have dollars where we only ha buttons."

407 pages, 7 x 9½ inches. Handsomely bound in cloth One volume. Price, $3.00.

SENT, POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS, Publisher, 96-102 Reade St., New Yor

Index to Reading Matter, Page 55.

Index to Advertisements, Pages 91 - 93.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

VOL. XLIII. NUMBER 5

NEW YORK AND CHICAGO, FEBRUARY 2, 1895.

ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



NATIONAL.

AMERICAN RADIATORS (TRADE-MARK.) BEST ON EARTH.

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

111 and 113 Lake Street, CHICAGO, ILL.

New York. 45 Centre St. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F & W CO.

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.

FULLER & WARREN CO. TROY, N.Y.

PARAGON HOT AIR FURNACES

SIX POINTS — 1·FEWEST JOINTS 2·EQUALIZED DRAFT 3·LARGEST RADIATING SURFACE 4·ABSOLUTELY SELF CLEANING 5·BALL BEARING GRATE 6·PERFECT ADAPTABILITY TO ANY KIND OF COAL

ISAAC A. SHEPPARD & CO. — MANUFACTURERS

PHILADELPHIA, PA. & BALTIMORE, MD.

Write for our FURNACE BOOK "HINTS ABOUT HEATING"
It will interest you IT MAY HELP YOU
EXCLUSIVE RIGHTS GIVEN TO ENTERPRISING DEALERS

APOLLO BEST BLOOM

the brand of galvanized iron that is true to gauge, at (does not buckle), and is uniformly workable bends without weakening).

GALVANIZED IRON

A first-class worker in galvanized iron knows, to his cost, the difficulties, in exacting work, imposed by refactory metal and sheets not flat, and the losses incurred through varying thickness.

EVERY SHEET GUARANTEED

The extra cost is too small to appear in small sales. The actual cost of his job to the worker is less, if well done

APOLLO IRON AND STEEL COMPANY

Pittsburgh Pennsylvania

WORKS AT APOLLO

Write for New Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES

HIGHLAND FOUNDRY CO., BOSTON, - MASS.

SECOND EDITION.

"Kitchen Boiler Connections."

A Selection of Practical Letters and Articles

—RELATING TO—

Water Backs and Range Boilers.

Compiled from *The Metal Worker*.
71 Illustrations.

A Practical Helper. Price, $1.00.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG

Has no terror for those using a

FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.

EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO.,
Boston, Mass.



We say
JENKINS' STANDARD PACKING
Is Best,

BECAUSE WE MAKE IT BEST.

We want you to say so, because you've proved it BEST.

JENKINS BROS.,
New York. Philadelphia. Boston. Chicago.

STEAM SPECIALTIES.

Pump Governors.
Steam Traps.
Steam & Water Reducing Valves.
Noiseless Back Pressure Valves.
Damper Regulators and Oil Separators.
Send for Circulars.



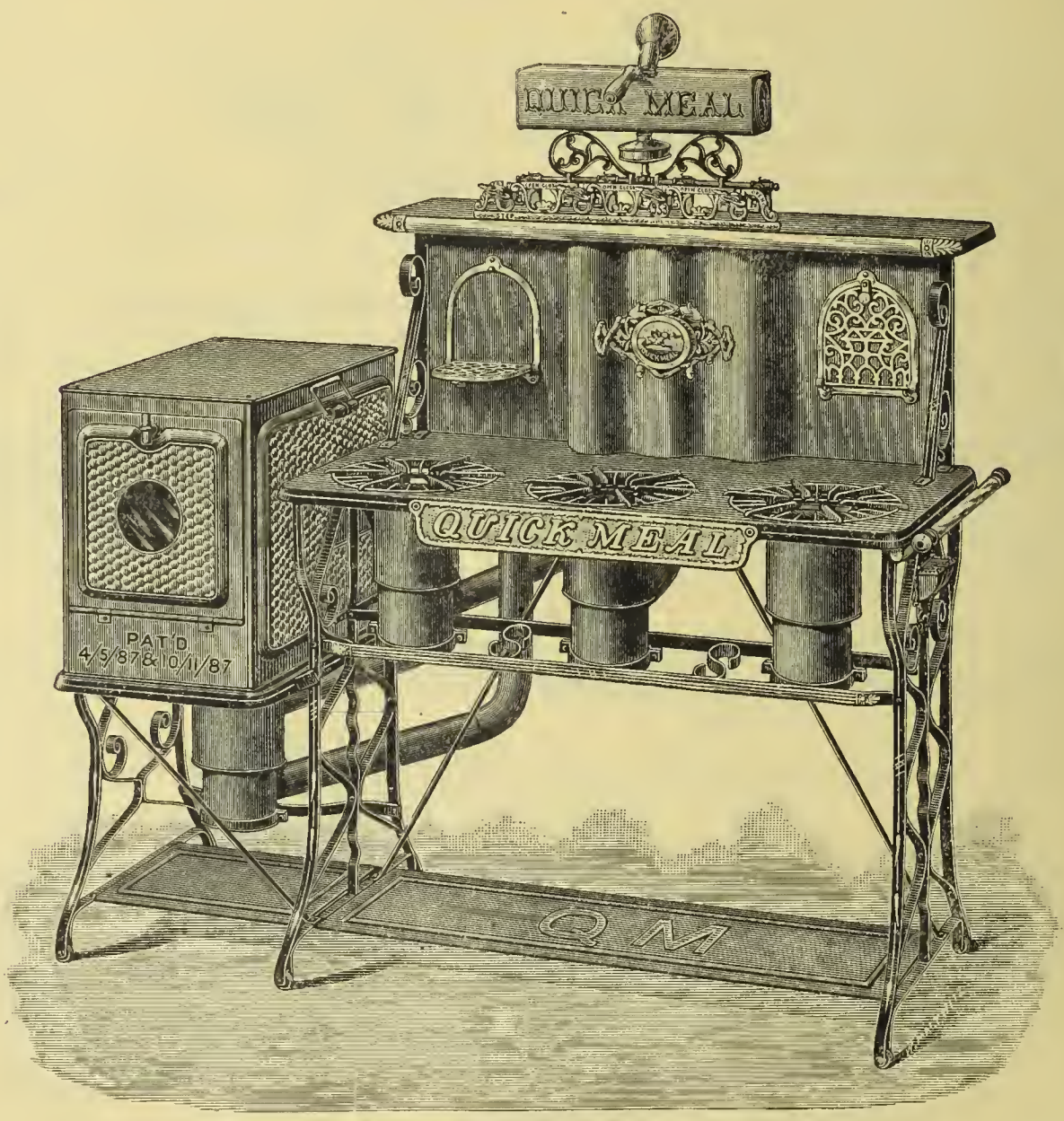
T. KIELEY, 7 to 11 W. 13th St., New York. Pressure Regulating Valve

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

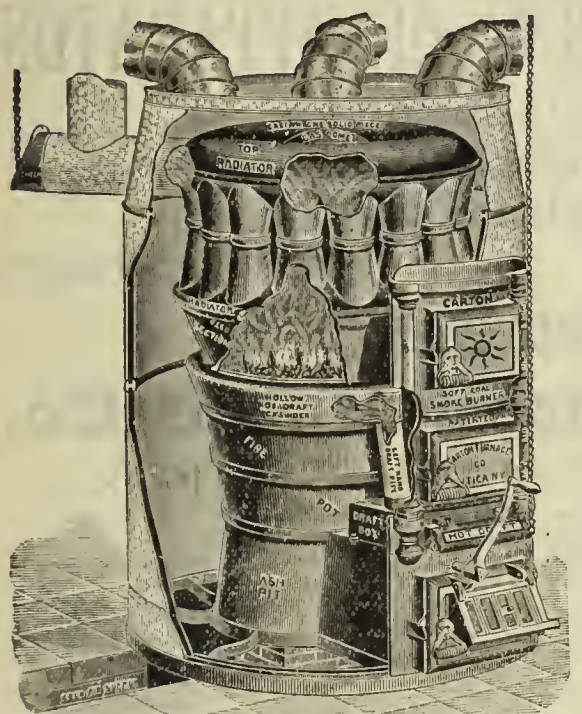
ST. LOUIS.

Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

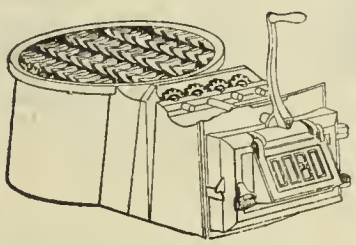
Hot Water & Steam Boilers & Furnaces.

OUR FOUR LEADERS.

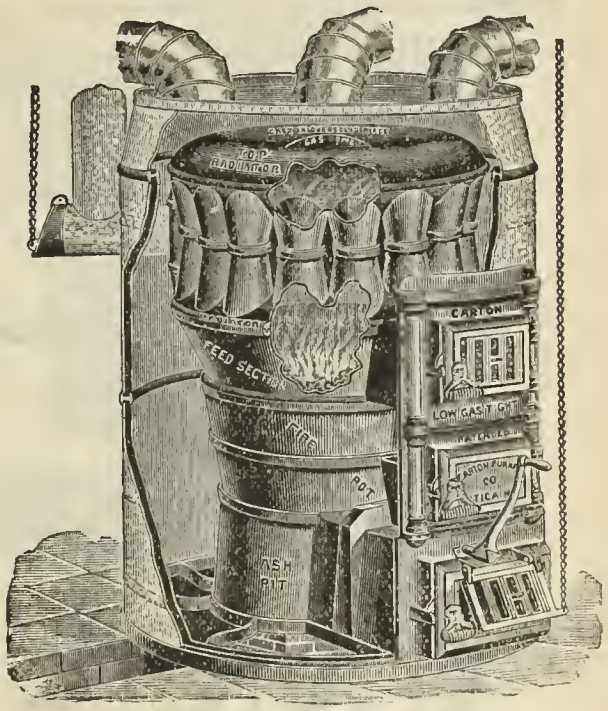


CARTON Smoke Consumer.

Four of a Kind that cannot be BEAT.



Our Crate.



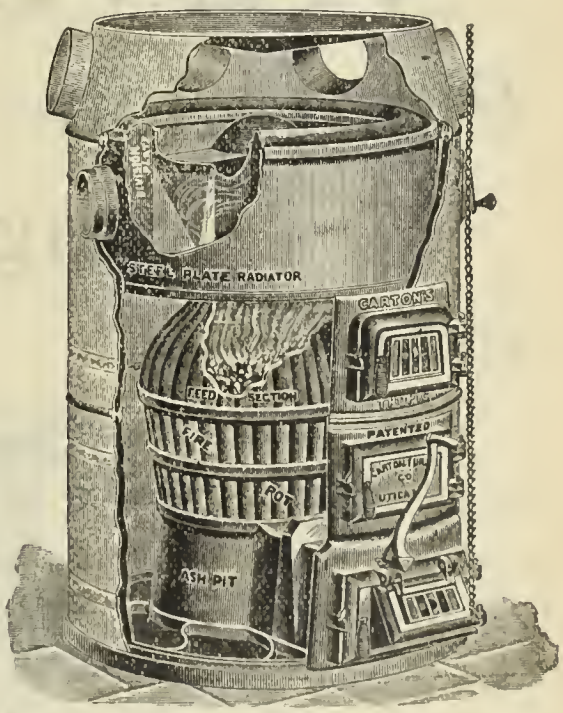
CARTON Low Gas Tight.



CARTON Junior.

The LARGST VARIETY of STYLES and SIZES.

EVERY FURNACE bearing our name is GUARANTEED.



CARTON Tropic.

OUR CATALOGUE AND PRICES WILL INTEREST YOU.

MANUFACTURED BY

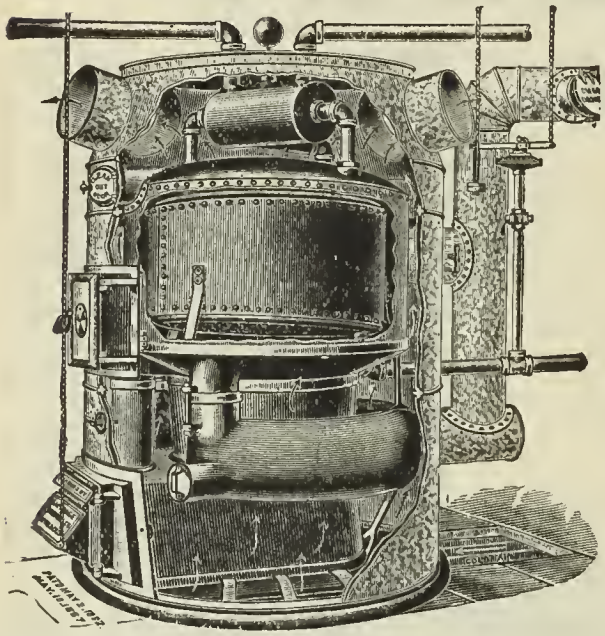
Carton Furnace Co.,

UTICA, N. Y.,

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

VAN'S Plantation Ranges.

With Broiler Attachment.

The finest, most convenient and best family range ever offered for soft coal, wood or natural gas. Write for our prices before buying elsewhere. It will pay you.

THE
JOHN VAN RANGE CO.,
Mfrs. of Wrought Steel Ranges, all sizes, and styles,
Cincinnati, Ohio.



KERNAN

Warm Air Furnaces,

MANUFACTURED IN A NEW PLANT EQUIPPED
WITH ALL MODERN FACILITIES. . . . .

Good Goods! Well Made! Low Prices!

JOBBING AGENCIES SOLICITED
FOR A COMPLETE LINE OF

Hard Coal
Cast Iron Furnaces.

Hard Coal
Steel Plate Radiator Furnaces.

Cast Iron Soft Coal
SMOKE CONSUMERS.

BRICK SET——or——PORTABLE.

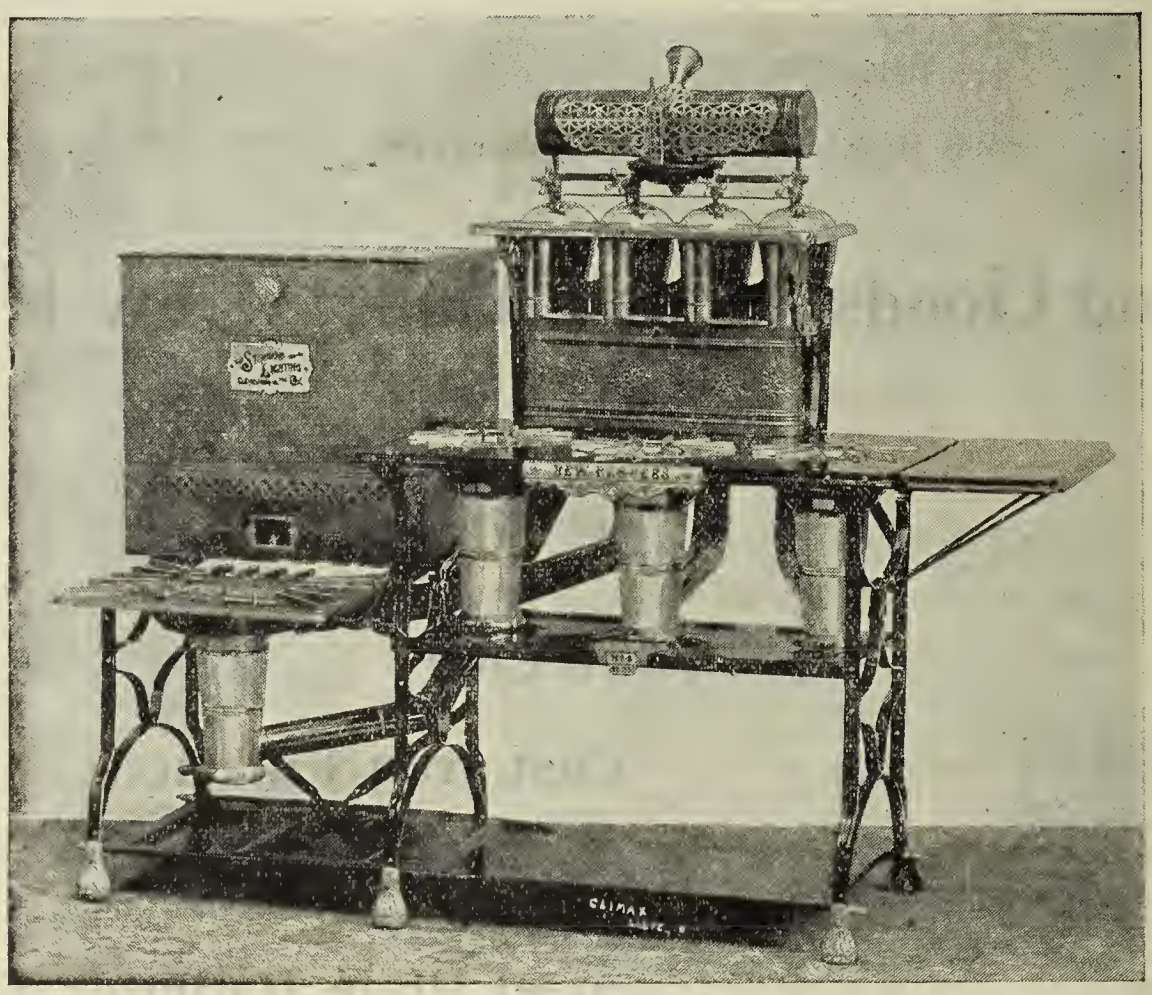
ALL SIZES: 13 to 34 Inch FIRE POT.

Send for Catalogues and Price-Lists.

Kernan Furnace Company,

CHICAGO, ILL. UTICA, N. Y.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

—MADE ONLY BY—

THE STANDARD LIGHTING CO.,

CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La.
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
Milton Rogers & Sons, Omaha, Neb.

Important Notice!

All dealers in and users of vapor stoves are hereby warned that **THE STANDARD LIGHTING COMPANY,** of Cleveland, Ohio, and its duly authorized licensees have the exclusive right to make, use and sell vapor stoves employing the evaporating principle as embraced in the several patents granted Charles M. Hollingsworth, Rudolph Flick and Zebulon Davis relating to Process and Apparatus for Vaporizing Liquid Hydrocarbons and to Improvements in Vapor Stoves, and that all who purchase, use, sell or offer for sale stoves embracing said inventions, or any of them, made by others than The Standard Lighting Company, or its authorized licensees, are liable to prosecution, as well as the manufacturers of such stoves.

Having been lately informed that a Vapor Stove was being manufactured and offered for sale in Milwaukee, Wisconsin, which infringed the Hollingsworth patents No 420,797, No. 421,834 and No. 470,756, and the Flick patent No. 483,051, The Standard Lighting Company has commenced suit against the manufacturers for infringement of these patents and is now prosecuting that suit in the Circuit Court of the United States for the Eastern District of Wisconsin. It has also brought suit for infringement of these patents in other districts against dealers who are advertising such stoves or offering them for sale, and hereby notifies all who may either sell or offer for sale infringing stoves that they, as well as the manufacturers, will be held responsible therefor. For the purpose of protecting its licensees, as well as itself against all infringements, it will bring suit against others who sell, offer for sale or use such inventions, or vapor stoves containing them, without authority from it, so far as may be necessary to fully assert its exclusive rights in respect thereto; and it requests all who may know of any sale or offer for sale of infringing stoves to promptly notify it of the name and residence of the person or company selling them, or offering them for sale, in order that it may proceed to enjoin such infringers and to recover such damages as may accrue thereby.

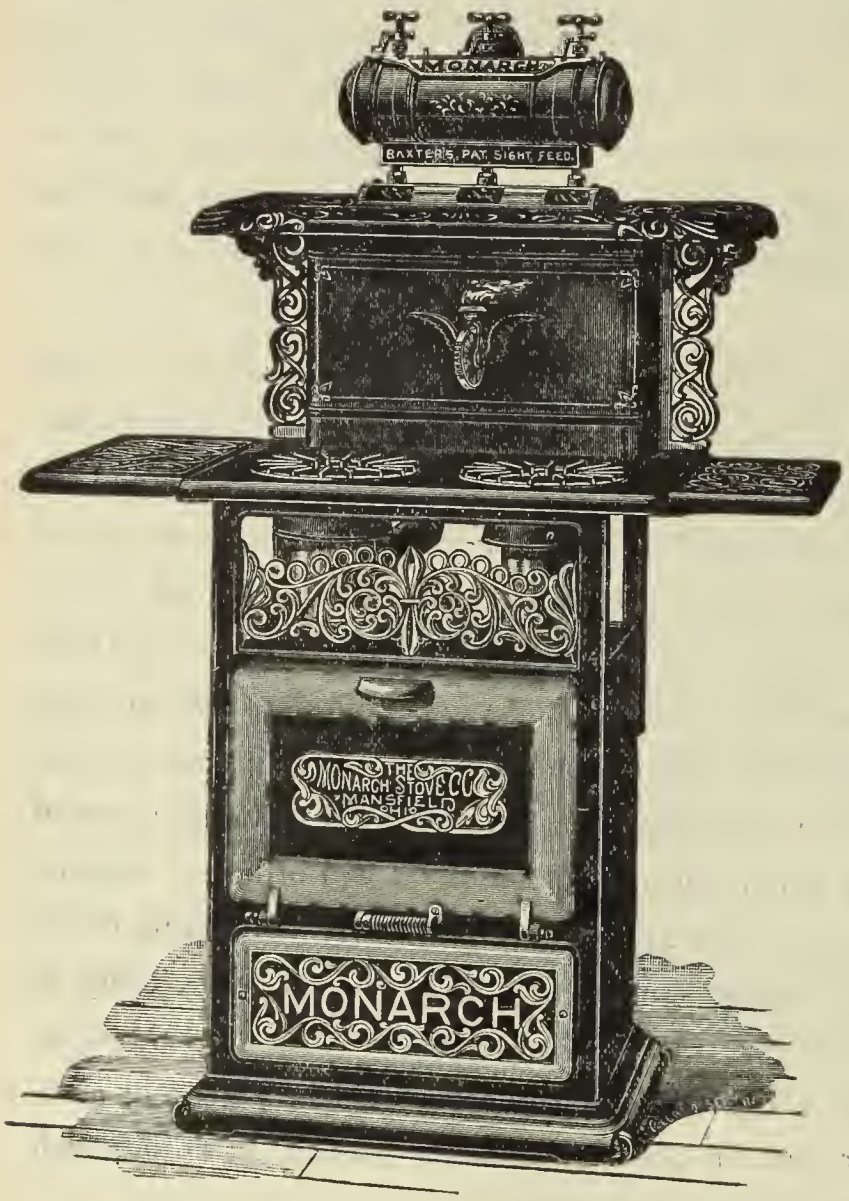
The following are the only authorized manufacturers of these inventions, to wit.:

THE STANDARD LIGHTING COMPANY, CLEVELAND, OHIO,
THE DANGLER STOVE & MFG. COMPANY, CLEVELAND, OHIO,
THE SCHNEIDER & TRENKAMP COMPANY, CLEVELAND, OHIO,
THE AURORA VAPOR STOVE COMPANY, CLEVELAND, OHIO,
THE QUICK MEAL STOVE COMPANY, ST. LOUIS, MO.,
JOHNSON & BRANDON, ST LOUIS, MO.,
GEO. M. CLARK & CO., CHICAGO, ILL.,
THE MONARCH STOVE COMPANY, MANSFIELD, OHIO

The Standard Lighting Company,

CLEVELAND, OHIO.

Throughout the year of Ninety-five
The MONARCH STOVE COMPANY will be alive;
And Dealers who 'gainst hard times strive
With MONARCH STOVES will see trade revive.





Our Spring Poet may be off color, but he sings truthfully. The new Catalog is now ready and it's a Hummer.

Yours for the asking.

A postal card will tell us you want one, and will be tickled to death to send it.

The Monarch Stove Co.,

MANSFIELD, OHIO.

AGENTS.

E. H. HUENEFELD, Cincinnati, O., - - Ky., Tenn., So. Ohio. So. Ind.
COOK RANGE & STOVE CO., Chicago, Ill., Wis., No. Ill.
DANVILLE STOVE CO., Danville, Pa., and 284-286 Pearl St., N. Y., Penna. New York. New Jersey, New England.
THE ZAHNER & BATTELL MFG. CO., Kansas City, Missouri, Kansas.
THE HALL BROS. CO., Lincoln, Neb.

DEALERS!

All Weak Points About Vapor Stoves

are not called to your attention by unscrupulous manufacturers or their salesmen. They often palm off imperfect and faulty stoves as perfect, and jolly you into the belief that you have struck a bargain.

But when summer comes and truth comes to light, as it invariably does in the vapor stove business, vexation and disappointment come with it. Vexation, because you have been duped, disappointment, on account of the loss of a season's profit.

Better handle a *good line* at a fair profit than a *poor* line at a *bargain* profit. There is no such thing as a "bargain," especially in the vapor stove business. *Proof*—Review the past???

Better buy from a responsible manufacturer or his legitimate jobber, especially of one whose integrity is unquestioned, and one whose knowledge of the vapor stove business secures you an honest deal and prevents the imposition of fakes or shoddy goods. *There are a few of us left.*

Better buy a good line to be successful. A *bad* stove is a very poor purchase at *any* price.

Better look for Protection.

Protection in order to be of service to you must begin at home. See that this point is not overlooked when casting about for a line for 1895.

Better think this over.

The old adage reads, "Make Haste *Slowly*." This is a weighty proverb. The more so when you consider that the best versed manufacturers in the vapor stove industry are not offering any new inventions or innovations for the coming season.

Yours respectfully,

THE SCHNEIDER & TRENKAMP CO.,

479-501 Case Ave., Cleveland, O. 67-69 Lake St., Chicago, Ill.

Jobbers Who Will Handle the Reliable for 1895.

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas and Oklahoma Territory.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F. FOX, Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of ;Kansas and Oklahoma.

IMPORTANT ANNOUNCEMENT.

To Our Patrons and the Trade Generally:

Our new Catalogue for 1895 will be ready for distribution within a few weeks. We take this means of announcing in advance of its publication that we have very carefully studied the requirements of the trade in every particular, and that our lines will be complete. We will place on the market specialties in entirely new goods that will commend themselves both by reason of popular prices and their many attractive and desirable features. In addition to our very popular Oilgas Cook Stoves, containing our improved 1895 Burners that are giving such perfect satisfaction, we have something entirely new in the line of special Lamp Stoves at special prices; also Sheet Steel Circular Burner Oil Cook Stoves. Write for further information and prices.

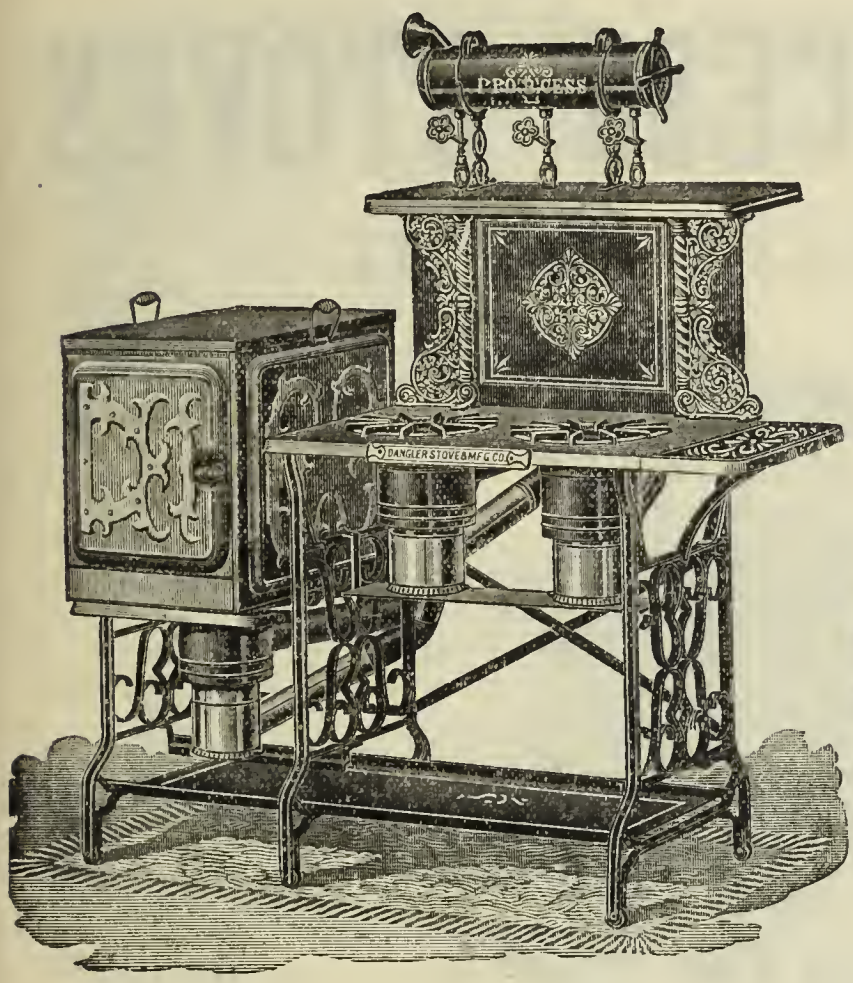
CENTRAL OILGAS STOVE COMPANY,

—Manufacturers of—

Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes.

BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.

Facts of Interest to the Public.



Our "PROCESS" for 1895, we can say unqualifiedly, is the

MOST PERFECT WORKING

PROCESS STOVE EVER PLACED ON THE MARKET, and HAS NO EQUAL.

In calling attention to our

NEW GEM STOVE,

We offer the trade a STOVE FOR THE PEOPLE and FOR THE TIMES.

THE GEM STOVE is CONVENIENT

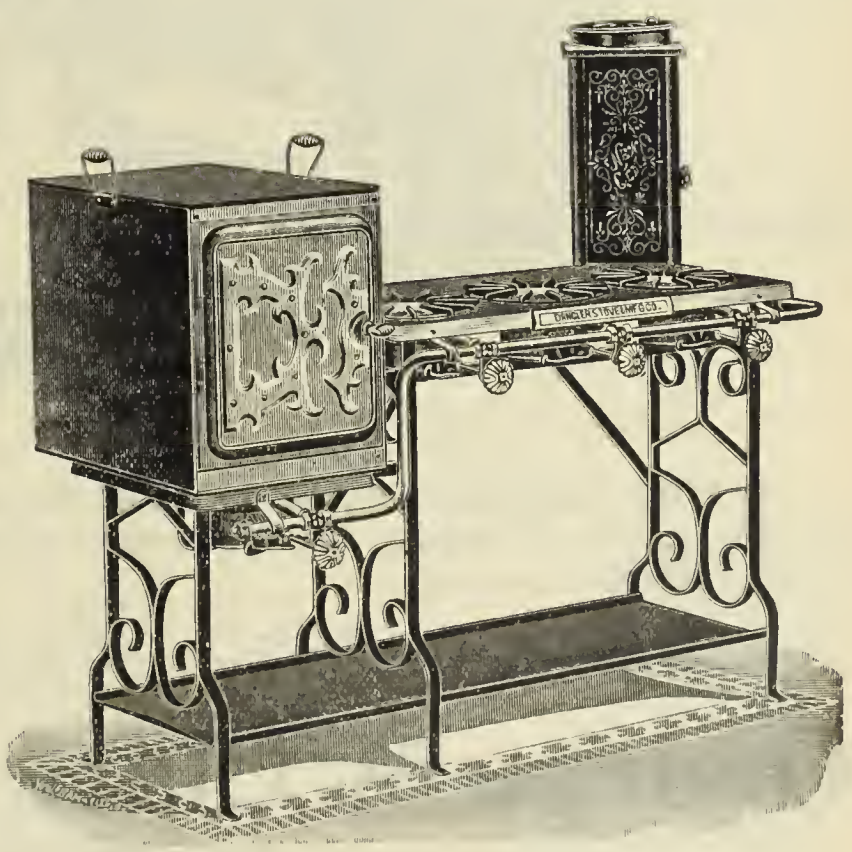
in SIZE, with the same sized flame as the PROCESS doing the same amount of work with **less fuel**, and at an original cost of only about ONE-HALF that of the regular high Stoves. This Stove is ABSOLUTELY our own, and CAN BE MADE ONLY BY US, and as pioneers in this business, the public naturally look to us for progress, while some of our competitors, who can only make the old line, call such improvements, "an innovation." Our GEM and PROCESS, together with our DELIGHT, celebrated JUNIORS, Individual and Single Generator Burner Stoves, &c., will give our trade a decided advantage over their competitors.

Write for Catalogue, 1895.

—THE—

Dangler Stove & Mfg. Co,

CLEVELAND, O.



WHOLESALE AGENTS:

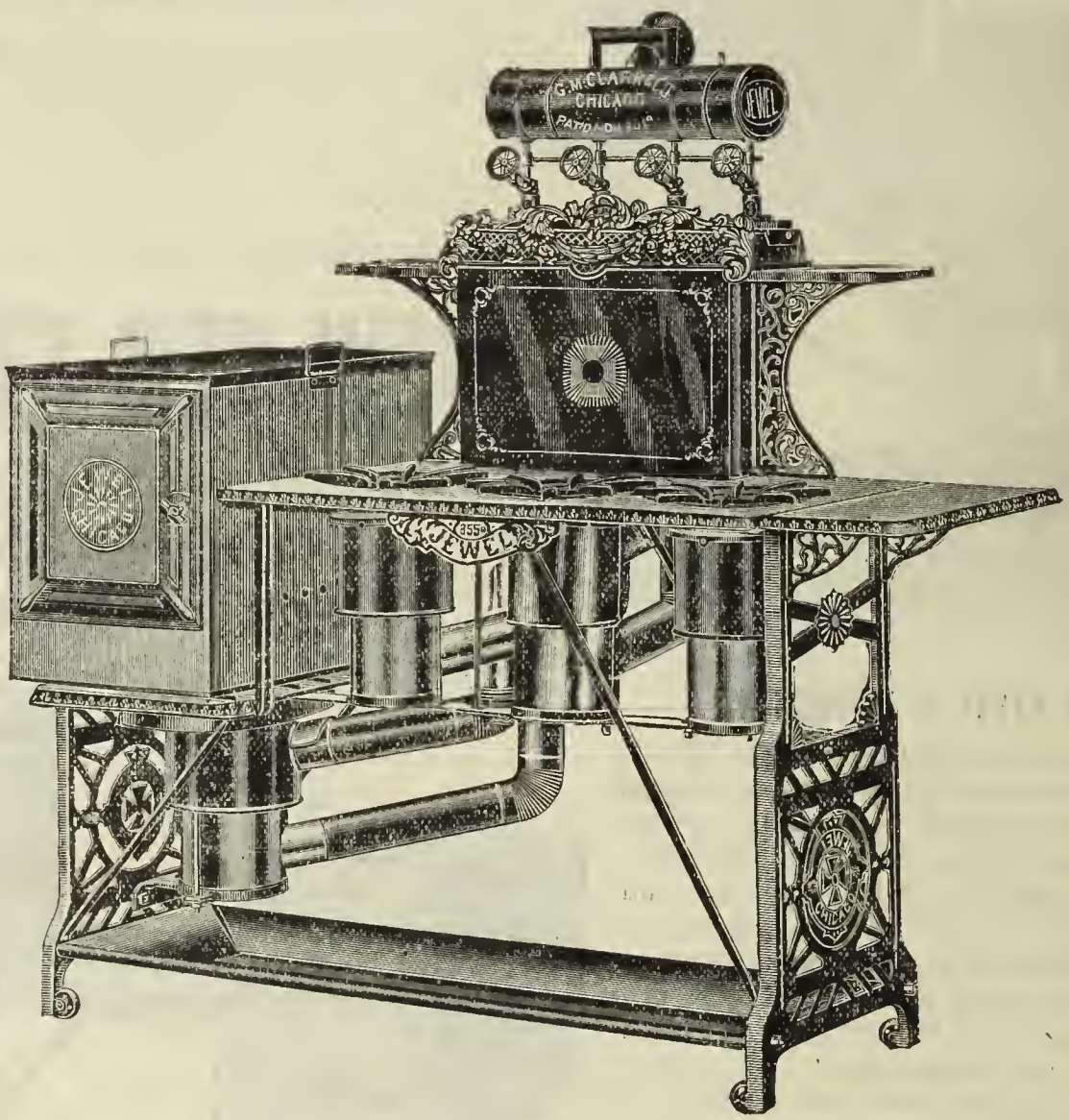
E. H. Huenefeld, Cincinnati, O.
Standart Bros., Detroit, Mich.
Mt. Penn Stove Works, No. 111 N. 2d St., Philadelphia.
Mt. Penn Stove Works, Reading, Pa.
Barstow Stove Co., No. 228 Water St., New York.
Barstow Stove Co., No. 56 Union St., Boston.
Home Stove Co., Indianapolis, Ind.
Denver Stove & Hdw. Co., Denver, Colo.
J. P. Lindeman & Sons, Milwaukee, Wis.
R. Robinson & Sons, Chicago, Ill.
Richards-Conover Hdw. Co., Kansas City, Mo.
The Stollberg-Clapp Co., Toledo, O.
Weber & Gebhart, Dayton, O.
Bradley & Munk, Columbus, O.
Foster-Stevens Co., Grand Rapids, Mich.
The Schaab-Puff Stove Co., St. Louis, Mo.
Dunlay & Geisler, Houston, Texas.
The Wooldridge Stove Co., Memphis, Tenn.
A. Baldwin & Co., Ltd., New Orleans, La.
M. F. Tallmage, Buffalo, N. Y.
W. E. Galbreath, S. E. cor. Lombard and Light Streets, Baltimore, Md.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

CATALOG READY SOON.

George M. Clark & Company,

MAKERS,

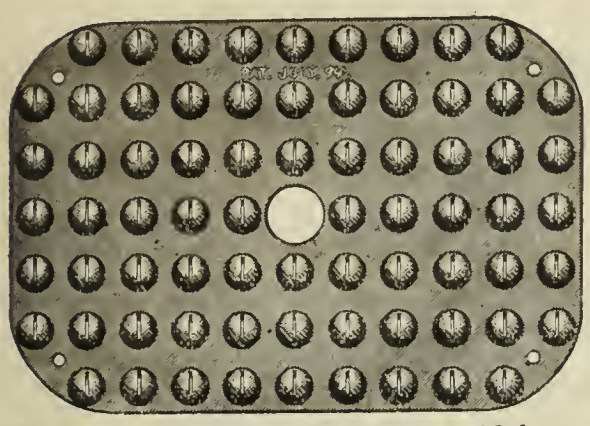
149-161 Superior Street, - - CHICAGO.

SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO. Buffalo, N Y.
BARSTOW STOVE CO., New York, N. Y.
W W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.



No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*

OUR JET CONE BURNERS distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of
REGULAR
and
SPECIAL JUNIORS.

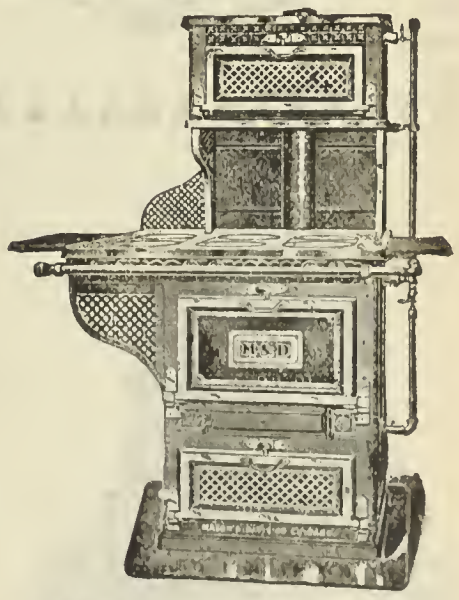


M & D
Wrought Steel Ranges

For Coal, Wood or Gas.

150 DIFFERENT STYLES AND SIZES.

M & D
Combination Range



For Coal and Gas or Wood and Gas. Single Oven and Double Oven, Gas and Coal Ranges.

SEND FOR CATALOGUE.

MASON & DAVIS CO.,

72 LAKE STREET, CHICAGO.

Announcement of

An Important Meeting to take place at Offices of

The Ferrosteel Company,

Wade Building, Cleveland, Ohio,

Monday, February 4th, 1895—And following days.

This meeting is one of orders and inquiries for Ferrosteel Ranges that will be received. Also applications for agencies. Orders from traveling representatives, too Will your order, inquiry or agency application be received with others? It's the style now to handle Ranges made of Ferrosteel. New sizes for 1895 Spring trade.



Simplest, Safest, Best.

Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET, - - - - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

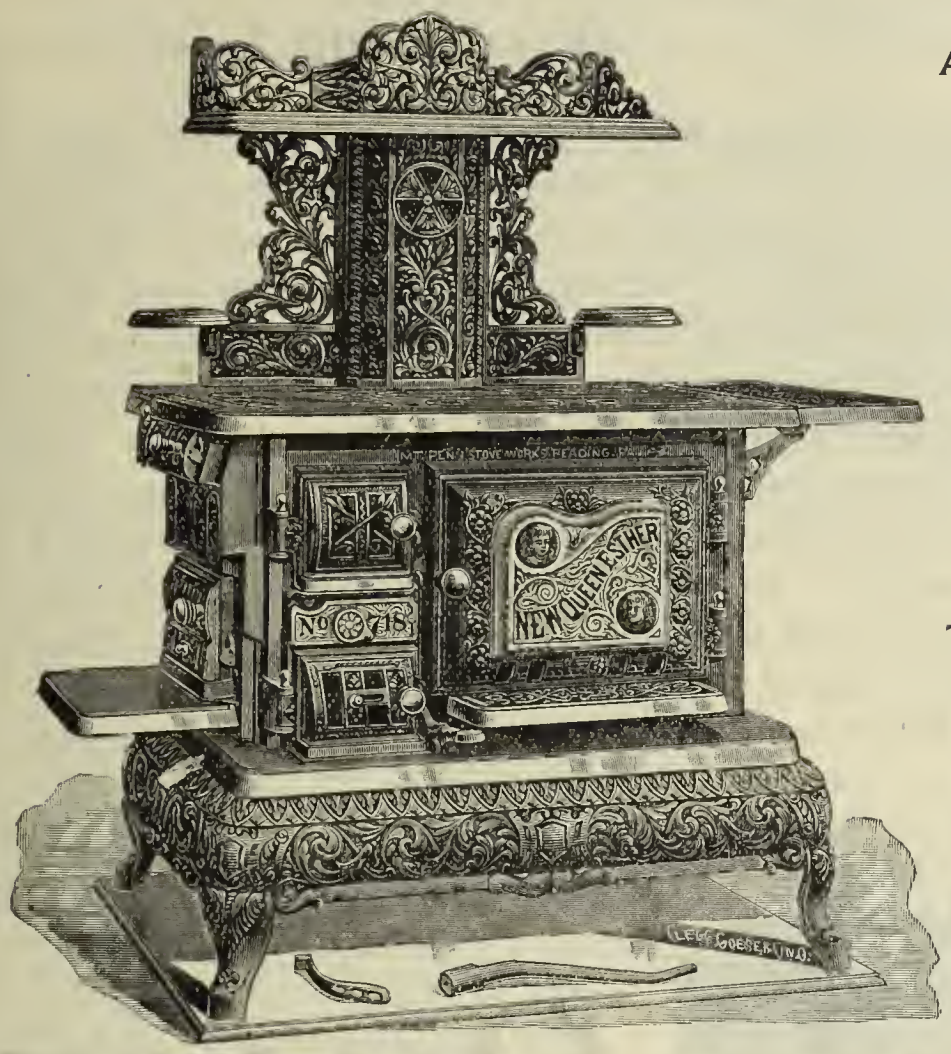
For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

OUR NEW QUEEN ESTHER



A Range embodying so many points of excellence as to carry its own recommendation to the thrifty housekeeper. Here are some of them:

Tin lined oven doors.
Patent pedal oven door opener.
Large broiling or feeder door.
Convenient flue clean-out.
Extra large flues.
Automatic or duplex grate.
Hot air attachment for auxiliary heating.
Provision for fire-box extension when burning wood.
Adaptability to coal or wood fuel.

The others we will mention on receipt of your postal.

Mt. Penn Stove Works,

Reading, Pa.



The Reservoir is Planished Copper, and holds fifteen gallons.

A FEW WORDS
TO THE PROGRESSIVE DEALER.

THE CINDERELLA KITCHENERS

Are an entirely new series of

ALL CAST IRON RANGES,

Adapted for burning

HARD OR SOFT COAL OR WOOD.

They have embodied in their construction many new and desirable features that are thoroughly practical and will meet the approval of the "up to date" dealers. The Cinderella Kitcheners are also made with feet and skirting in lieu of the Low Closet. A full complement of High Shelves and High Closets accompany the same. Every appointment is the latest, and for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No 716,	Oven 16 x 16, 10½	inches high.
718,	18 x 18, 11½	"
818,	18 x 18, 11½	"
719,	18 x 20, 12½	"
819,	18 x 20, 12½	"
821,	20 x 22, 13½	"
921,	20 x 22, 13½	"

IF YOU ARE INTERESTED WRITE FOR PRICES.

We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

We Would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited, - - Pittsburgh, Pa.

Taplin, Rice & Company,

—Manufacturers.—

DICTATED BY P.

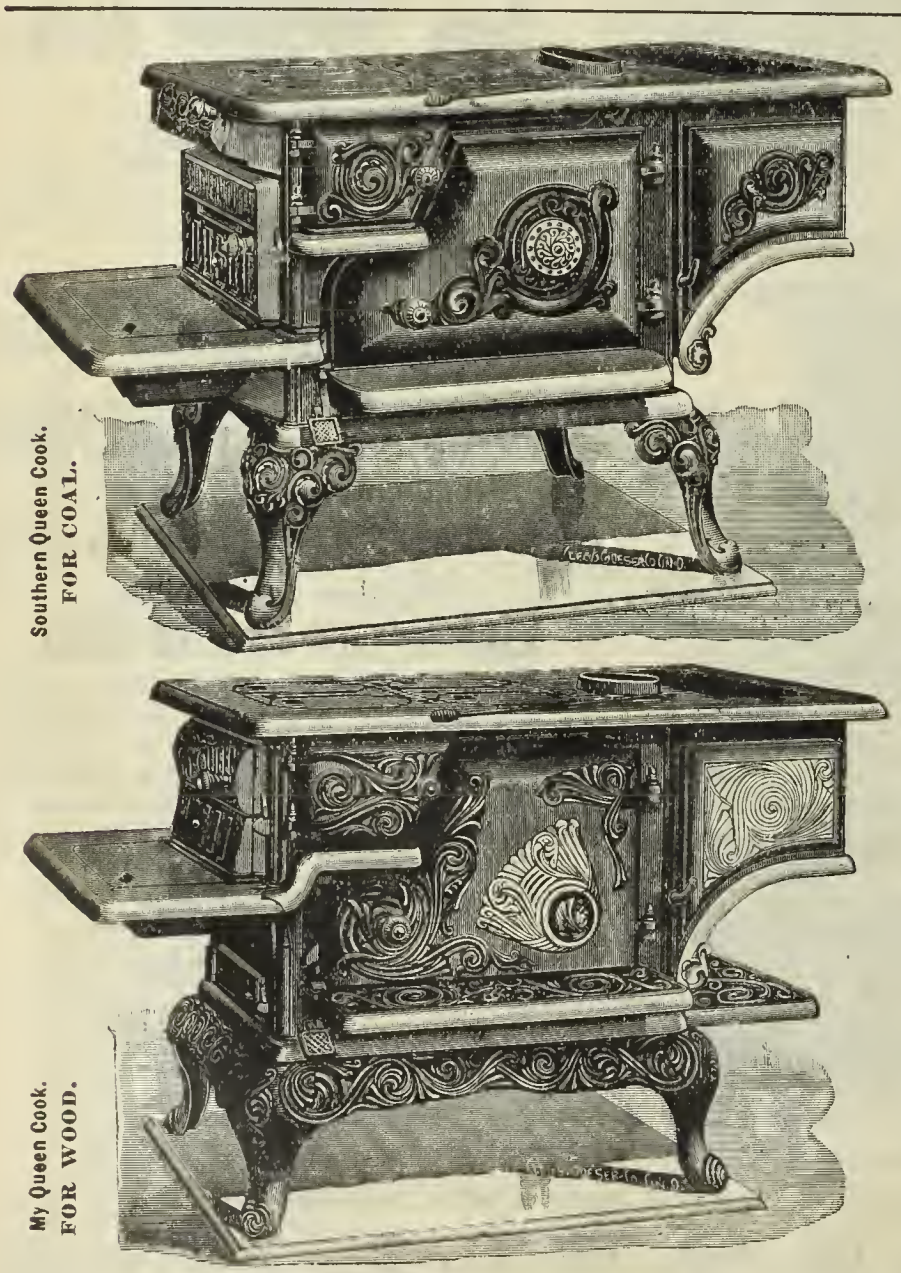
Akron, Ohio, January 29, 1895.

BY THIS we beg to call the attention of the trade to the fact that during the current year we will be on the market with several new patterns of Steel Ranges and Heating Stoves, of superior construction, ornamentation and attractive form, the patterns of which are well under way and will soon be ready for the sand. The Climax Steel Range, which will be made in all the various conventional forms and styles, will be both as to construction and appearance second to none on the market. We will also have ready for the trade in due time a "Climax Air Blast" and "Climax Air Tight" heating stove in different sizes, the constructive features of which will be a radical departure from any pattern of stove ever offered, and we feel well assured they will wherever introduced take a leading position in the line of special heaters. Cuts and prices of these Ranges and Stoves will be mailed on application at an early date, and we are confident you will feel justified in deferring your order for supplies until samples or cuts of stoves named may reach you.

With grateful appreciation of former courteous favors shown us by the trade, we remain,

Very respectfully,

TAPLIN, RICE & CO.



Southern Queen Cook.
FOR COAL.

My Queen Cook.
FOR WOOD.

THE

Queen

SERIES

of Cook Stoves for both wood and coal are the highest exponent of the stove maker's art. This is an entirely new line with us and we will show the entire variety from week to week in this space.

The Portsmouth Stove & Range Co.,

Portsmouth, O.

W. E. Anthoney & CO., Detroit, Mich., and Minn.

---

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.



IT has been said that in America TWO CLASSES of Stoves and Ranges are sold, viz.:

"GARLANDS"

—AND—

OTHERS.

At the very head and front of the "Others" stands our new line of

"MICHIGAN"

Stoves and Ranges, which are unquestionably the latest, handsomest and most artistically designed Stoves and Ranges to be found upon the market at anything like the price at which they are sold.

They are made under our own supervision; by same workmen and out of the same material from which "Garlands" are made, and this fact of itself should be sufficient to cause them to be preferred by discriminating merchants and consumers, as against all other brands, excepting the invincible line of "Garlands."

GARLAND STOVES AND RANGES The World's Best

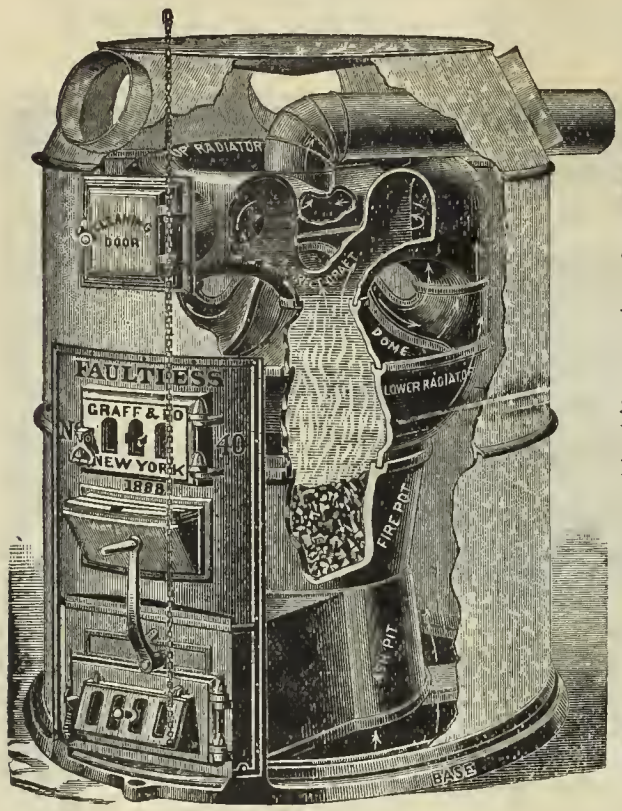
The Michigan Stove Company,

Largest Makers of Stoves and Ranges in the World.

DETROIT, BUFFALO,
CHICAGO, NEW YORK CITY.

WILL H BRADLEY DES

FAULTLESS.

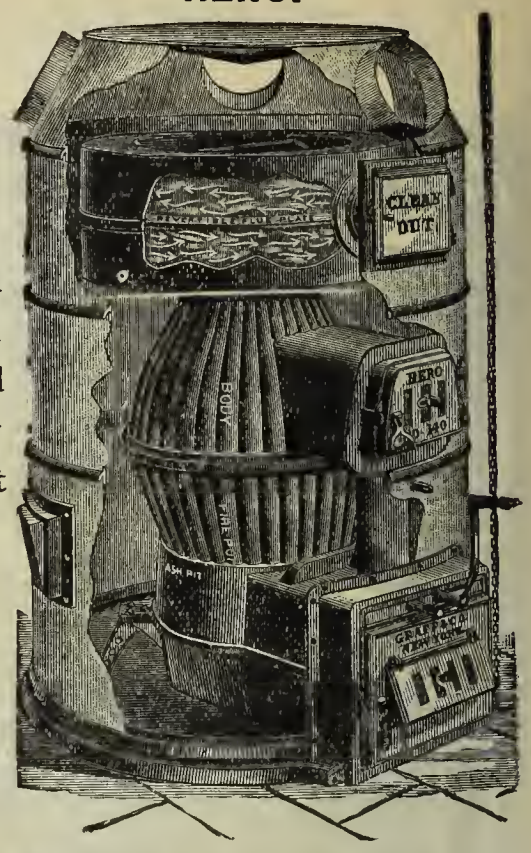


YOU WANT THE BEST FURNACE

That you can buy, and we have got it. You will not be disappointed in any selection you may make from our assortment of

FURNACES OR RANGES.

HERO.



SMITH & BRIGHT,
175-177 Lake St., Chicago, Ill.

GRAFF & COMPANY, Manufacturers,
208 Water Street, New York.

FURNACES

The TRIUMPH Series.

"There are none better."

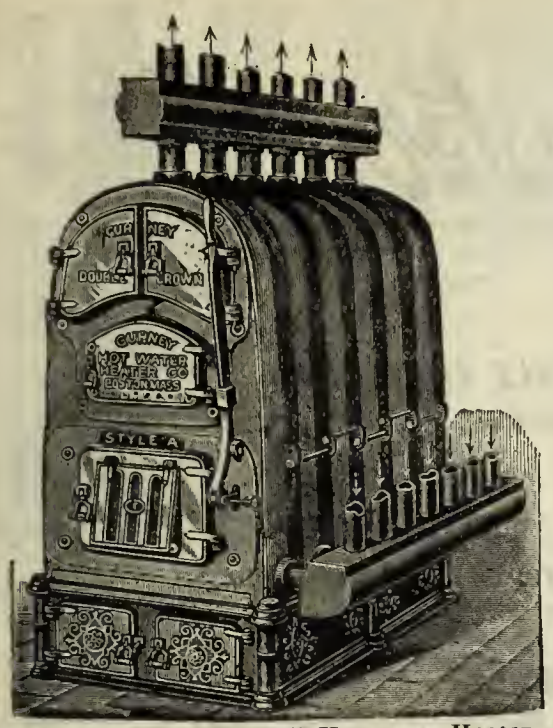
Mfd. by

The Craig-Reynolds Fdy. Co.,

DAYTON, O.

GEO. D. HOFFMAN,
Mgr. Western Branch,
82 LAKE STREET, CHICAGO,

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



Gurney "Double Crown" Hot water Heater.
Style "A."

RESULTS ARE CONVINCING EVIDENCE.

THE GREAT SUCCESS WHICH

Gurney

HOT WATER HEATERS, STEAM BOILERS, RADIATORS,

Have attained is due to the **FACT** that they embody

BEST

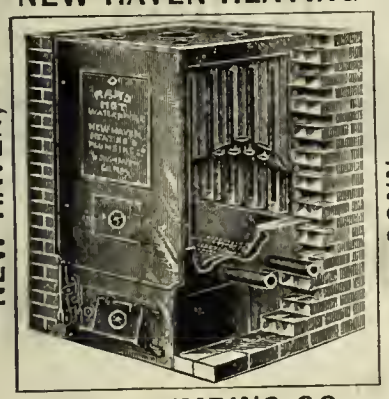
WORKMANSHIP,
CONSTRUCTION,
MATERIALS,
ADAPTABILITY,
IDEAS.

ALWAYS EQUAL TO THE OCCASION.

Send for Catalogues.
Sold only to the Trade. **GURNEY HEATER MFG. CO.,** 163 Franklin St. Cor. Congress, Boston, Mass.

Selling Agents, A. A. Griffing Iron Co., 34 Dearborn St., Chicago, Western States.

NEW HAVEN HEATING



AND PLUMBING CO.

Rapid Hot Water Heater,

Selling rapidly to the Trade only.

MONEY IN IT FOR YOU.

Send for Catalogue, Price-List and Discount.



"Soleil" Safety Steam Boiler.

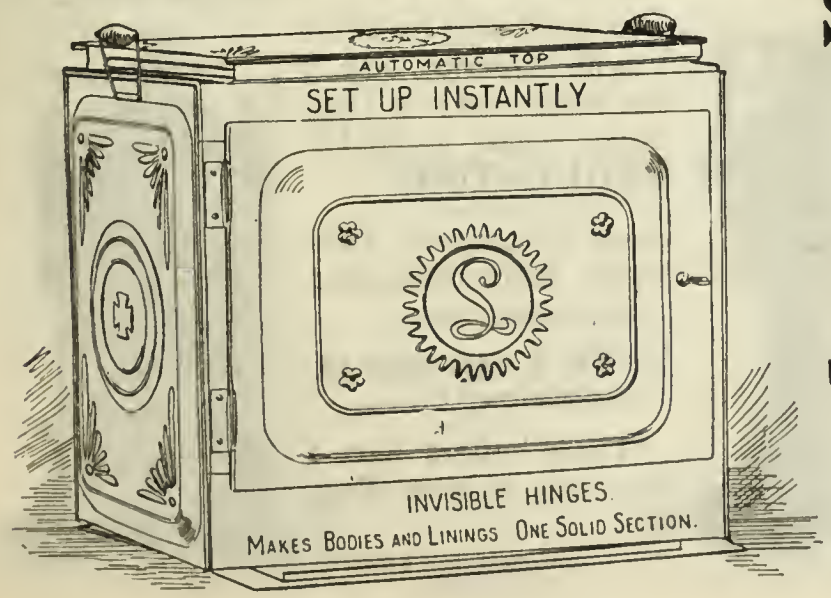
All the Excellencies

of **Superior Quality,** with the **Additional Recommendation** of **Reasonable Cost**— our Steam and Hot Water Heaters.

Radiators, Valves, Pipe, Fittings, Floor and Ceiling Plates, Etc.

American Boiler Company

94 Centre St., New York. **84 Lake St., Chicago.**



SAVE FREIGHT!

Solid Folding Ovens.

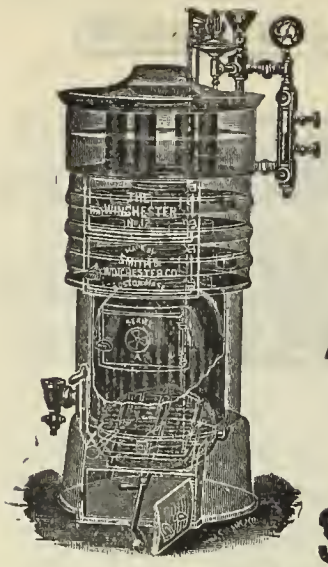
Complete Assortments of Vapor and Oil Stove Ovens.

J. P. LINDEMANN & SONS,

MANUFACTURERS,

MILWAUKEE, WIS.

Send for Samples, Prices and Catalogue.



The Winchester



Has more **COMMENDABLE**

And less **OBJECTIONABLE FEATURES**

Than any Heater on the Market.

——MADE BY——

SMITH & WINCHESTER CO., Boston, Mass.

Our prices on these Heaters will please you. Send for them.

LARGEST ASSORTMENT OF STYLES AND SIZES IN THE MARKET.
CORRESPONDENCE SOLICITED.
CATALOGUES GIVE FULL DESCRIPTION.

SOLD ON THEIR MERITS NOT ON THEIR ANTIQUITY.

Royal HEATERS

COMBINATION.

HOT WATER. STEAM. HOT AIR.

MANUFACTURED BY
HART & CROUSE.
UTICA, N.Y.
NEW YORK 211 WATER ST.
CHICAGO 79 LAKE ST.



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.





KEEP IN MIND

The Plummer
Steam Heater
AND
The Leader
Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,

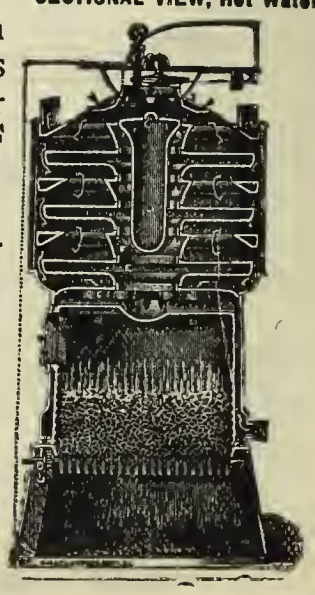
PUTNAM, CONN.

THE VOLUNTEER

STEAM



SECTIONAL VIEW, Hot Water.



For hot water or steam has no superior, and is the only hot water boiler that is **SELF REGULATING.**

Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Street.

— "You remember Robinson, our old schoolmate?" he asks of Mr. Carroll Johnson, on the end.

"Perfectly," says Johnson; "the old boy's doing well, I hope?"

"Oh, yes; he's married, prosperous and has three children."

"All living?" asks Johnson, kindly.

"Well," says Thatcher, hesitatingly, "two are living, and one is in Brooklyn."

"That's all right," blusters Johnson. "I'm a Brooklyn man myself. And I tell you Brooklyn has something New York will never have."

"What's that?" asks Thatcher.

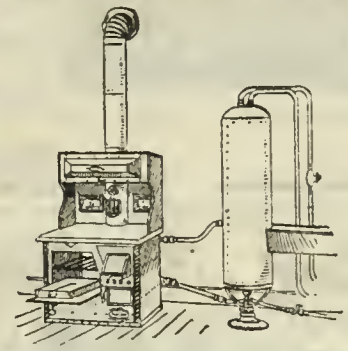
"The other end of the bridge."—*The Press.*

— An Energetic Intellect.—Schoolboy: "There's one thing about discovering places that always puzzles me. There's Bermuda for one, that was discovered by a man named Bermudez: how did he come to hit on a place with a name just like his own?"—*Harper's Bazar.*

★ STAR WATER BACK AND BOILER ★
COUPLERS.

DONT WIPE YOUR JOINTS — SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

NO SOLDER NO BURST — ANY MECHANIC CAN DO IT

WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

★

Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.

Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada.

★

THATCHER

The Celebrated

"Thatcher"

FURNACE and RANGES.

GAS-TIGHT.
DURABLE.
ECONOMICAL.

Also Manufacturers of the

"CHAMPION"

Steam and Hot-Water Heaters.

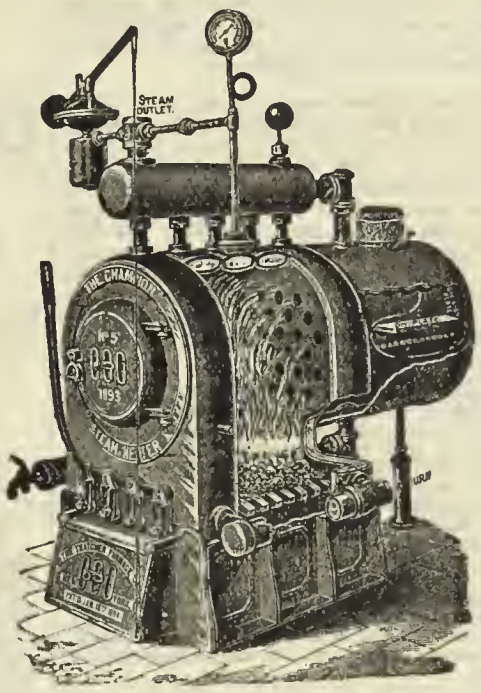
Sold by the trade extensively throughout the country.

Specified by Leading Architects.

Illustrated Catalogue Sent Free.

The Thatcher Furnace Co.,

240 WATER ST., NEW YORK.



Champion Steam Heater.

Has advantages over any other Heater.

Send for Circular.



THE MAHONY BOILERS.

For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.

— JONES: "Heard about Smith's scheme to get a crowd to his store?"

— JEANS: "No. What is it?"

— JONES: "He advertises to perform a most astounding feat of modern magic, and when he gets the crowd he turns a peck of potatoes into a barrel.—*Printers' Ink.*"

— CONSIDERATION: "And how did your performance come off?"

"Splendidly," replied the enthusiastic amateur actor. "The ladies wore big hats and the people in private boxes interrupted nearly every scene. They treated us exactly as if we had been professionals."—*Washington Star.*

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student, and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

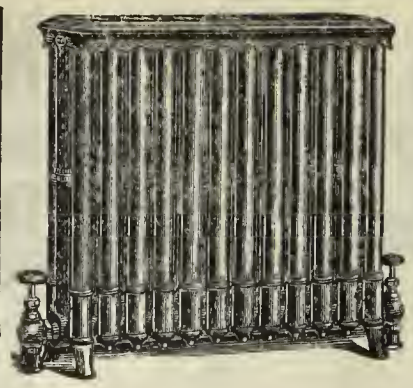
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

86-102 Reade St., New York.



THE H. B. SMITH CO.

Manufacturers of STEAM AND WATER

Heating Apparatus,

For Public and Private Residences.

SPECIALTIES:

THE UNION AND ROYAL UNION HOT-WATER RADIATORS.
GOLD'S IMPROVED SECTIONAL BOILERS.
MILL'S SAFETY SECTIONAL BOILERS.
REED'S IMPROVED CAST IRON RADIATORS.
GOLD'S INDIRECT PIN RADIATORS.
BRECKENRIDGE'S PATENT AUTOMATIC AIR VALVES.
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for Hard or Soft Coal.

Office and Warerooms: 137 Centre St., New York.

Union Radiator. Catalogues sent on application. Foundry, Westfield, Mass.

STEAM HOT WATER WARM AIR
FOR HEATING ALL CLASSES OF BUILDINGS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

CAPITOL HEATERS

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best

—FOR—

Steam or Hot Water Heating.

—o—

Send for Catalogue.



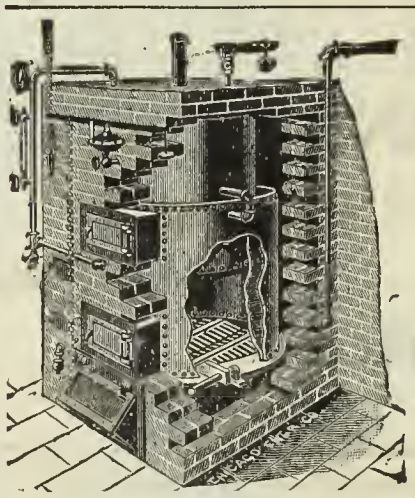
The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

Packed Joints.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use **HARD or SOFT COAL.**

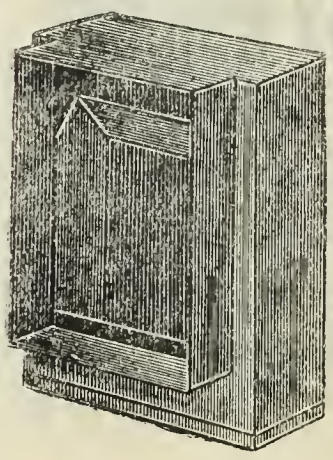
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



Novelty Ventilated Wall Pipe,

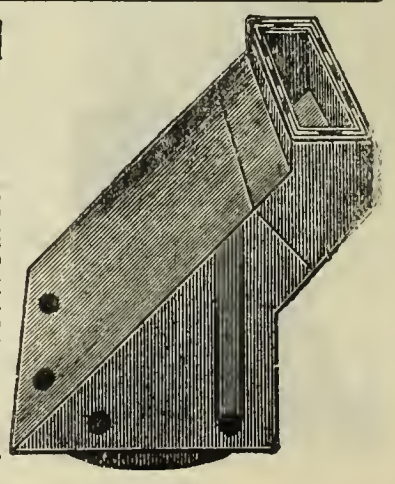
Absolutely Fire Proof.

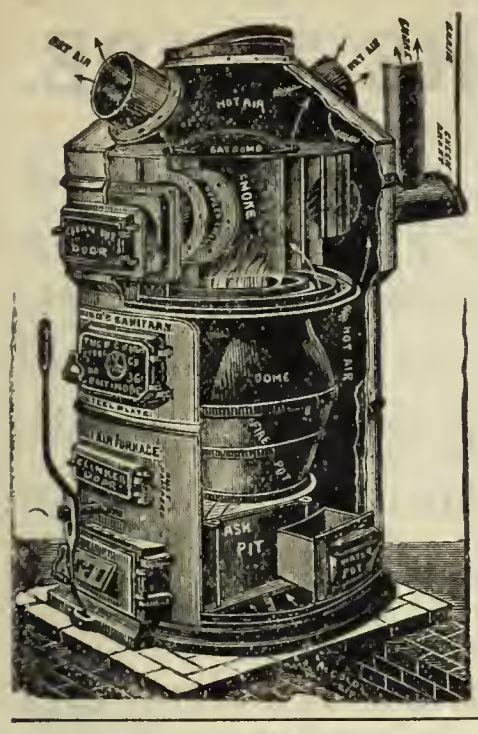
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER,

18 Wood Street, Pittsburgh, Pa.





THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

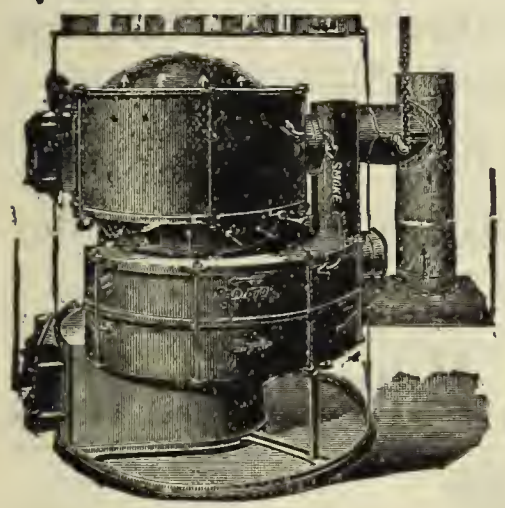
The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

Baltimore Fire Place Heaters.

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.
Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

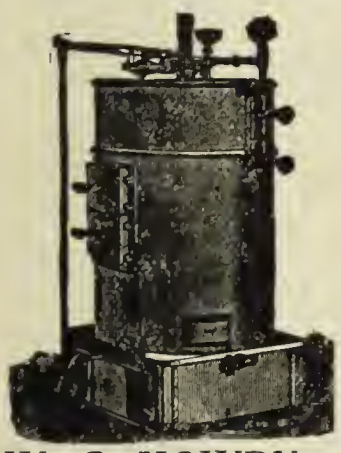
It Is a Base Burner.
It Is a Great Economizer of Fuel.
It Does Not Heat the Cellar
It Is a Low Furnace.

The "Perfect" Ventilator

The "Crown" or "Stasch" Folding Bake Pan.

Agents Wanted. Address—
The CORNING MANUFACTURING CO.,
CORNING, N. Y.

"JUST A LITTLE"



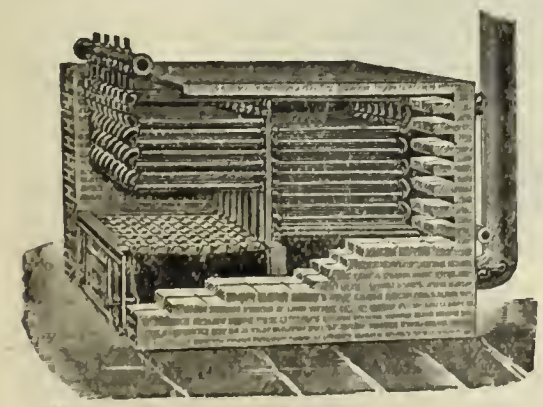
FUEL, TIME, CARE } TO { RUN IT. SET IT UP. MANAGE IT

That's all, and how it does heat!

WHAT? Why, the "PAGE."

Further information will cost you the time of writing for our catalogue—it's worth it.

W. C. MOWRY, Lock Box 314, NORWICH, CONN.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

Over 300 Different Sizes.

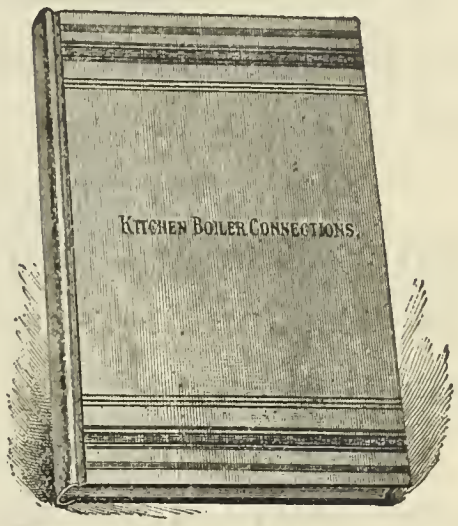
SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
15, 17, 19 ACHILLES ST., **ROCHESTER, N. Y.**
New York Office, 44 Dey Street.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth, Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome.—*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,
96-102 Reade Street, NEW YORK

TO OUR FRIENDS AND THE TRADE.

The warning published in the last issue of THE METAL WORKER shows how much the "combine," who unreasonably claim that they are the only ones who have the right to build certain gasoline stoves, are afraid of us.

We have for years carefully studied the patents that certain parties claim we infringed, and also all other vapor stoves, and we are prepared to substantiate our claim that we do not infringe the patent of any one.

We are manufacturing under our own patents. We claim that every evaporating stove manufactured infringes our Kitson Patent No. 385,673, and we propose that every infringer shall sooner or later have ample opportunity to contest our claims if he sees fit.

We hereby warn every one not to buy anything except L. & H. process stoves unless they are prepared to pay us royalties under that patent.

A. J. LINDEMANN & HOVERSON CO., Milwaukee, Wis.

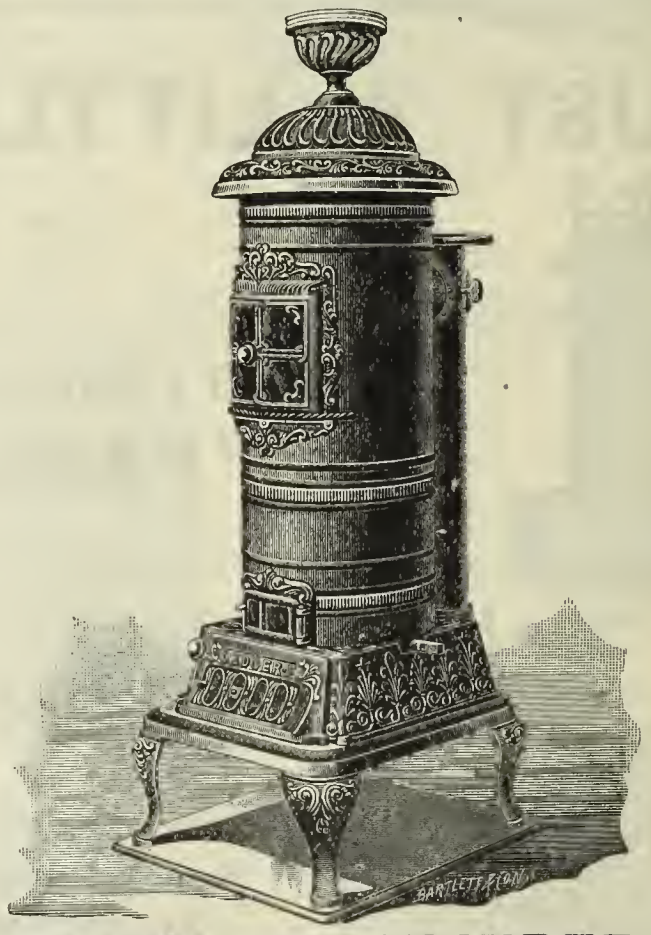
An Up-to-Date Residence.

Jarvis Edson, a New York City manufacturer, has just completed a new residence for himself uptown, which embraces a number of modern features not commonly found in an ordinary private dwelling house. In the basement is installed a double engine, such as are found in ocean-going steamers. This will generate electricity, which will be used for heating and illuminating the house. Electricity will do the cooking in the kitchen, which is on top of the house. The kitchen is equipped with aluminum utensils. The engine will also operate a refrigerating or cold system, which in the summer will extend all over the house. Electric bells, electric dumb-waiters, an electric passenger elevator and electric ventilating fans are among the comforts provided. The roof of the house has been arranged for a summer garden, and will be illuminated during the season.

— IN NO VERY GREAT HURRY.—A good story is told of a lazy and loquacious farmer whose farm lies just outside Worcester. He called at a neighbor's house recently. "Sit down, sit down!" exclaimed the neighbor. "I don't know as I ought," replied the farmer; but nevertheless he sat down. After some talk about the crops and the value of an adjoining piece of ground the farmer said, slowly: "I don't know as I ought to be sitting here. I came over to see if I could get a ladder; our house is afire!"—*London Weekly Telegraph.*

— TOM BIGBEE: "I believe the president of this road, when he was a boy, sold candy on the trains."

Uncle Oatcake: "You don't say so! They do charge high for the candy, but I hardly thought there was so much money in the business as that!"—*Exchange.*



LEDGER F CYLINDER.

WITH REVERTIBLE FLUE. No. 9, No. 10, No. 12, No. 14.

Well made, attractive in appearance and attractive in price. Made both as a plain cylinder and with revertible flue as above. Circulars and prices are worth seeing. Send for them.

THE STAMFORD FOUNDRY COMPANY,

STAMFORD, CONN.

DEALERS

EVERYWHERE SHOULD CONSIDER THE FOLLOWING:

THEY CANNOT FAIL TO FIND SUITED TO THEIR TRADE,

Gasoline Stoves, Oil Cooking Stoves,
Oil Heating Stoves, Lamp Stoves,
and Gas Hot Plate Stoves,
Together with Full Lines of Ovens and Furniture.

In the following Large Assortment of First-Class, Popular and Reliable Goods we are offering

"AURORA" Process Gasoline Stoves.

"ARGAND" Improved Junior Lines, High, Low and Step Gasoline Stoves.

"ROYAL" Round Wick, High and Low, Oil Cookers, with new and desirable features.

"ROYAL" Flat Wick, all Cast, Nickel Finish, Oil Cookers.

The Largest Line at Low Prices on the Market.

"ROYAL" Lamp Stoves, One, Two and Three Burner. Polished Nickel Finish, Sheet Iron Chimneys, Brass Burners.

"JOCKEY" Lamp Stoves, One, Two and Three Burner. Japan and Bronze Finish, Tin Chimneys, Cast Burners.

"SHOO-FLY" Lamp Stoves, One, Two and Three Burner. Japan Finish, Tin Chimneys, Tin Burners.

"SHOO-FLY" Double Lamp Stoves, with Two and Four Hole Extension Tops. Mounted on Highly Ornamental Base, Finished in Polished Nickel and in Japan.
All our "Shoo-Flys" are great sellers.

GAS HOT PLATE STOVES.

Full Nickel, White Nickel and Plain Finish.

"CHAMPION" Two and Three Burner. Special New Line, 1895. Large, Smooth Top Surface, something entirely new, stands high, and has our Removable Burner and Air Adjuster. The most common sense stove ever made.

"MAGIC" Two and Three Burner. Special New Line, 1895. Popular priced, Large Flush Top Surface, stands high, has Double Burner and Air Adjuster.

"ARGAND" One, Two and Three Burner. Flush Top, Double Removable Burners, Beautiful Design.

"FIRE-FLY" One, Two and Three Burner. Flush Top, Double Removable Burners, Popular Priced and a great seller.

Also New Line "ROYAL" Oil Heaters.

With such an assortment of First-Class, Popular and Reliable Goods to select from we believe it will pay you to see us before buying elsewhere.

THE PERRY STOVE CO.,

ALBANY, N. Y. 242 Water St., New York City.

OVER ONE MILLION IN USE

ACORN

Are You Satisfied

That you are doing your share of the stove business? Are the goods you are selling exactly suited to your trade?

Perhaps you have doubts about this, and are intending to investigate the subject. Let us assist you in reaching a decision by sending catalogues and prices, or one of our salesmen, to explain some good things about

Acorn Stoves and Ranges

"Acorns" represent the only "up to date" assortment in the market. There are no old back number patterns. Everything is new and modern. There are special styles to suit ***YOUR SECTION,*** and the prices are down to hard pan.

We can make it to your interest to sell Acorns if you will give us the opportunity.

RATHBONE, SARD & Co

ALBANY, N.Y. DETROIT, MICH.
CHICAGO, ILL. AURORA, ILL.

EASTERN FOUNDRIES — ALBANY, N.Y.
WESTERN FOUNDRIES — AURORA, ILL.



HOW HE DOES TALK ! !

Great Gods! How he does talk about the superlative merits of the ***LEONARD CLEANABLE REFRIGERATORS !*** Any salesman can do the same and capture all the sales. Secure the agency.

Grand Rapids Refrigerator Co.,

GRAND RAPIDS, MICH.



WHY IS IT

that the same dealers who sold the **Boomer Furnace** five years ago are still continuing its sale?

DID YOU EVER STOP TO THINK

that one or two years' experience with a poorly constructed light furnace always creates a demand for a furnace that has proven to be the best in the full sense of the word?

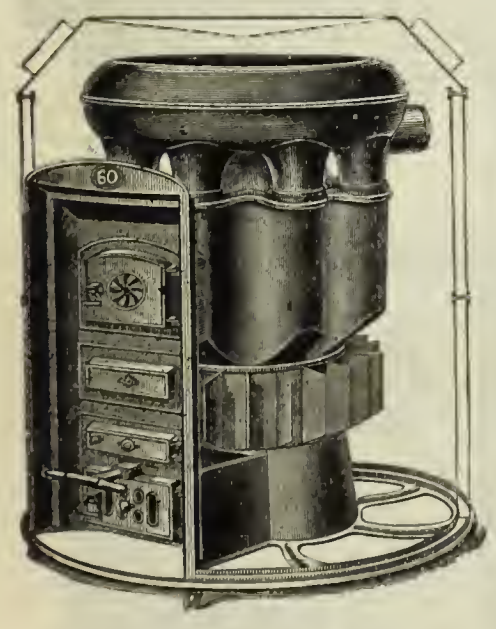
IF YOU WANT TO MAKE MONEY

buy the Improved Boomer Furnace, set it up right, please your customer, and you have the key to your future success.

REMEMBER

that a Boomer Fire Pot has never been known to crack or burn out. That it has the simplest and most effective Gas and Smoke Burner. Guaranteed the heaviest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS. **Massillon, Ohio.**



CORY'S

ALL CAST IRON

GAS-TIGHT FURNACES.

The purchaser will never ask if this is the *best* quality made, as all dealers understand the "Cory Furnace" to be only of *cast iron*, without bolted joints; gas-tight and durable. Quality exactly the same in twenty sizes from $35 to $125.

UZAL CORY & CO.,

210 Water St., New York.

Estab'ished 1847.

M I C A

MICA OF ALL GRADES

—FOR—

STOVES and Mechanical Purposes.

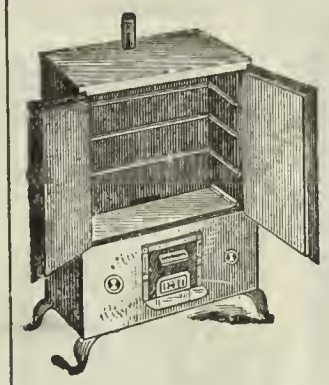
PALERMO MICA CO.,

Miners and Importers and Wholesale Dealers.

S. T. PECKHAM, Sales Mgr. **27 Peck Slip, New York.**

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.

Burlington, Vt.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL.
Prop.,
88 Fulton St., N. Y.

NEW HAMPSHIRE

MICA

IS THE BEST.

The F. E. BELDEN MICA MINING CO.,

12 Broad St., Boston, Mass.

— It is said to be an old story, this of a man named Doherty, who was drilling with his squad of recruits in London. Doherty was 6 feet 2 in hight, and at that time the sergeant-major was a man whose hight was only 5 feet 4. On this day he approached the squad looking sharply about him for some fault to find.

All the men squared up except Doherty and the sergeant-major at once accosted him.

"Head up, there, man!" called he. Doherty raised his head slightly.

"Up higher, sir!"

The head was raised again. Then the sergeant major managed, by standing on his toes, to reach Doherty's chin, and he poked it higher, with the remark:

"That's better. Don't let me see your head down again."

By this time everybody was interested at seeing Doherty staring away above the sergeant major's head, when a voice from above said in a rich brogue:

"Am I always to be like this, sergeant-major?"

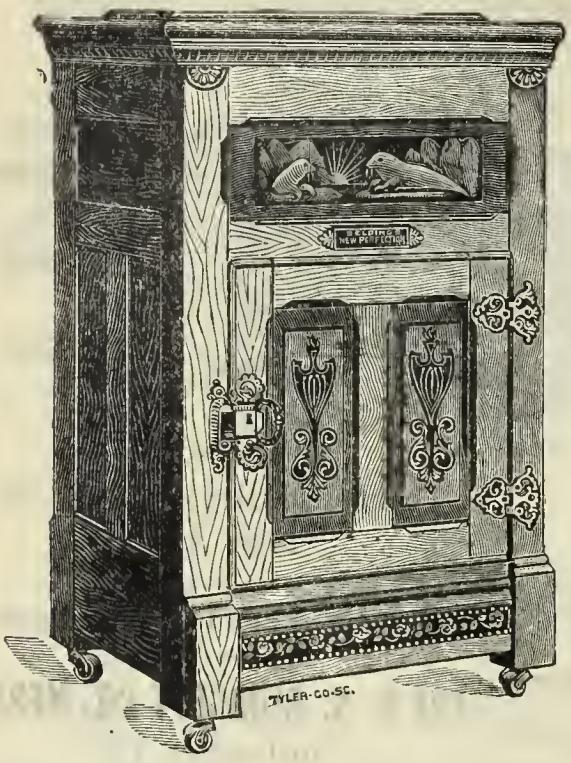
"Yes, sir."

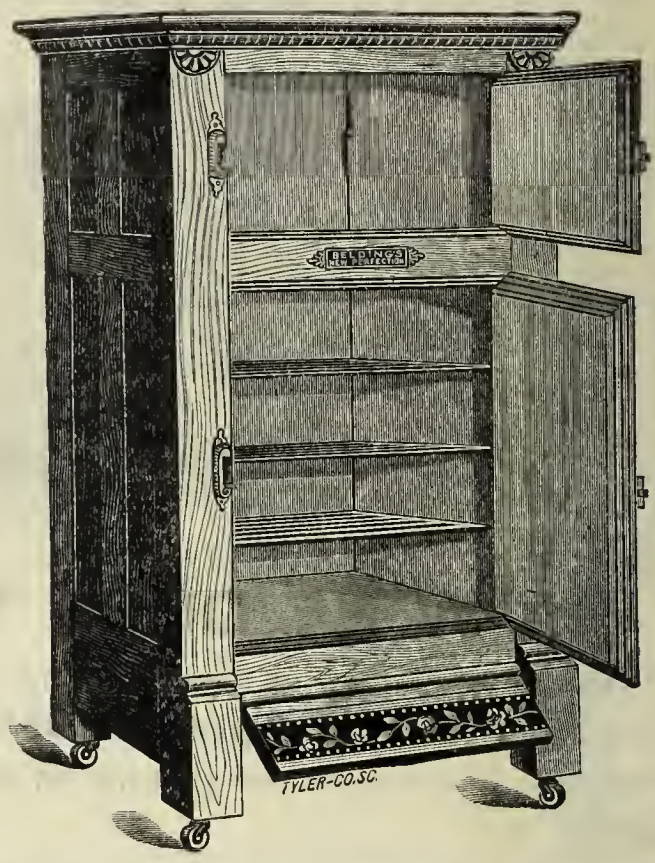
"Then I'll say good bye to ye, sergeant-major, for I'll never see yez again."—*Exchange.*

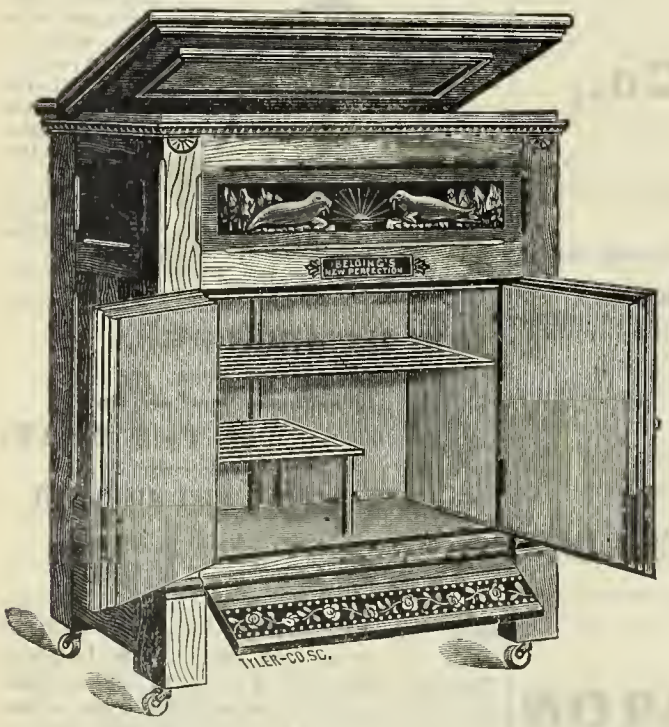
—Where to Tell It.—"I'll tell you a tale that is positively hair raising in—"

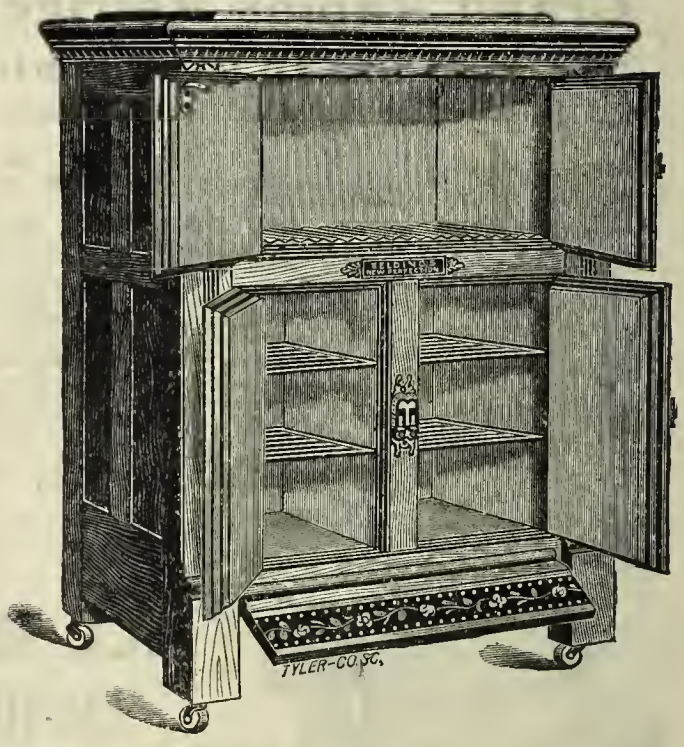
"Tell it to Jobson; he's bald headed."—*Smith, Gray & Co.'s Illustrated Monthly.*

BELDING'S REFRIGERATORS.

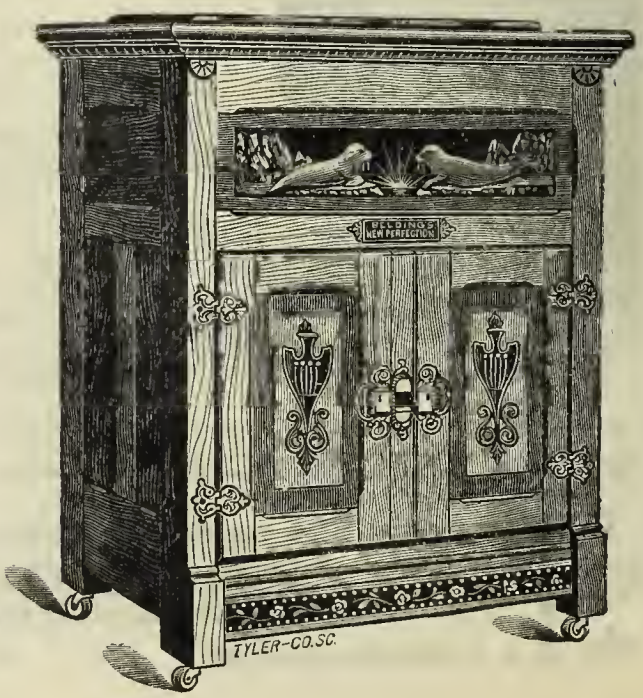




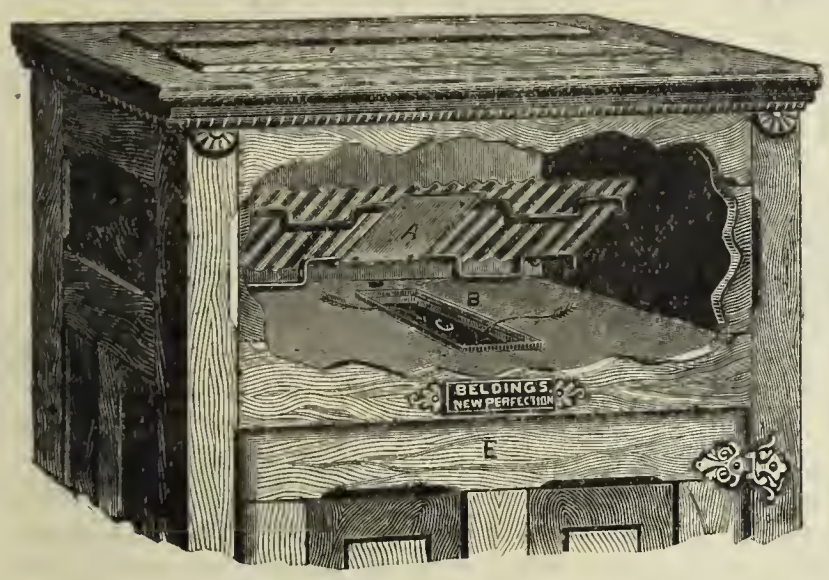




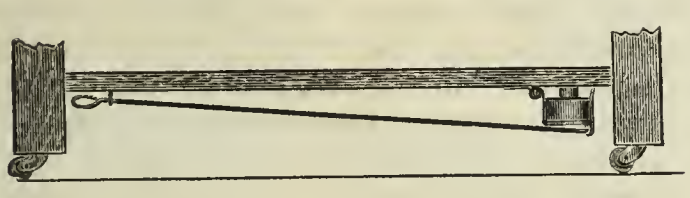


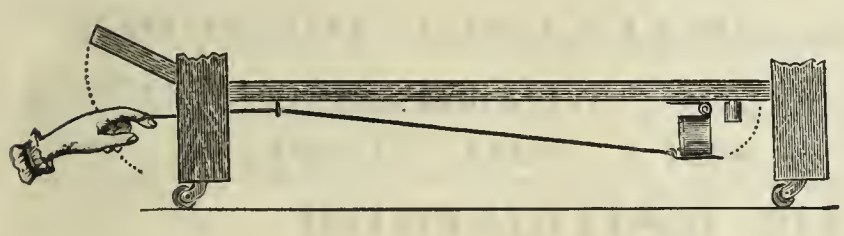


See Points of Excellence Over Others.



Patent Applied For.





OUR NEW AUTOMATIC COLD AIR DAMPER ATTACHMENTS.

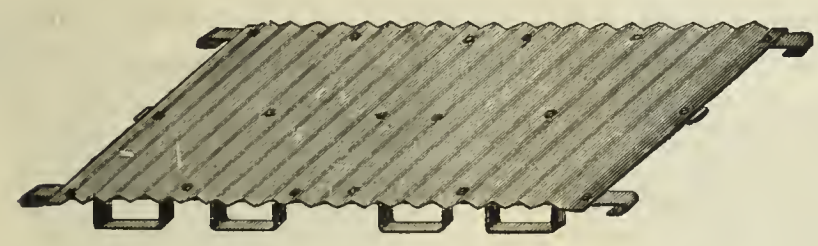
This cut shows a section of our Refrigerator with the New Automatic Cold Air Damper closed.

A—Represents Metal Ice Rack.
B—Bottom of Ice Compartment.
D—The **New Automatic Cold Air Damper.**
E—Door of Provision Chamber.

When the door of the Provision Chamber is opened the Cold Air Damper *immediately* closes the opening through which the cold air drops, thereby *instantly stopping the circulation* in the Refrigerator. Then, as the cold air in the Ice Compartment *cannot escape*, it is impossible for warm air to enter it through the flues in the sides of the Refrigerator; therefore, while the door of the Provision Chamber is open *no ice is wasted, no cold air escapes* and *no warm air enters* the Ice Compartment or *comes in contact with the ice.*

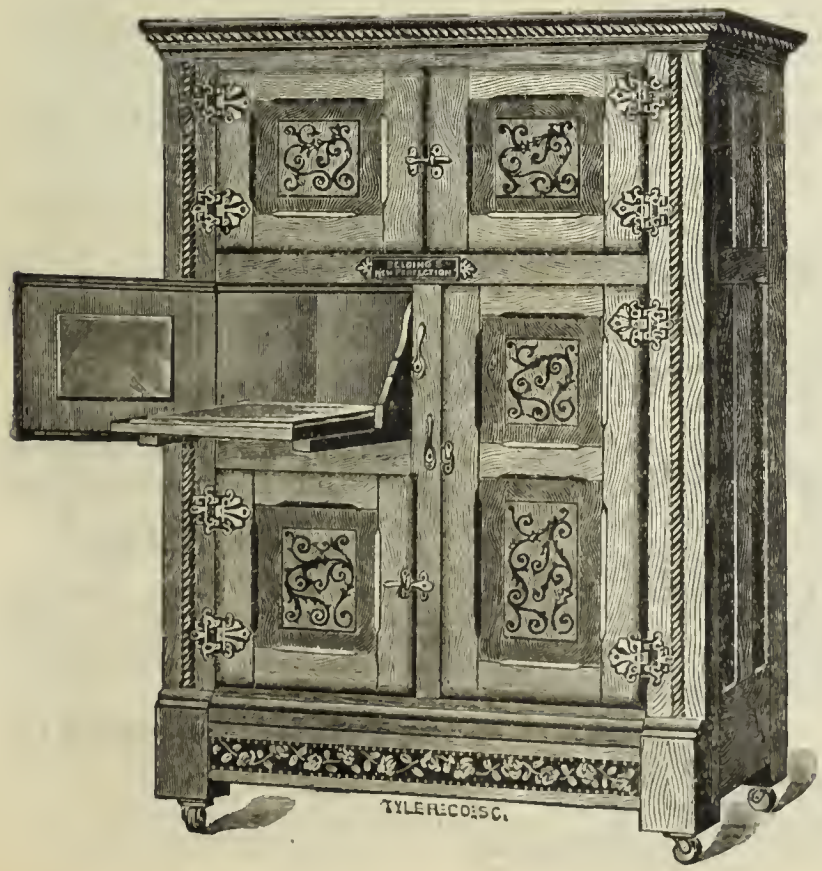
Thus it is clearly shown that this improvement is a *practical* one and makes our Refrigerators *consume less ice* than any that are now on the market.

OUR NEW DRIP CUP ATTACHMENT.



SOLID METAL ICE RACK.

No wood cleats to get water soaked and tainted.



All refrigerators **hardwood, antique finish.** We carry large stocks at all of the following places:

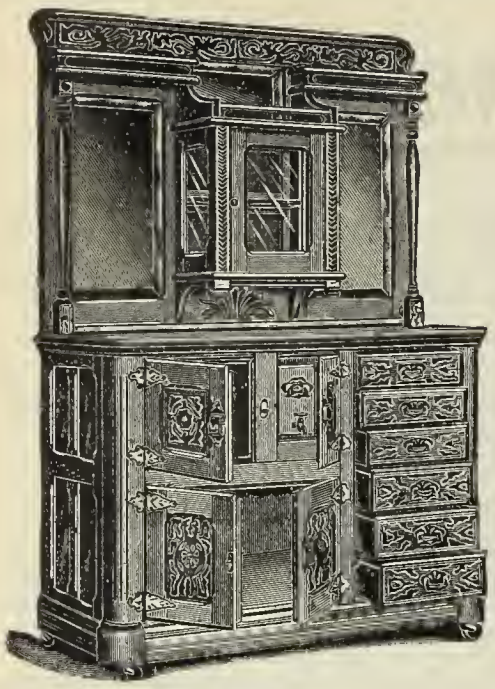
Belding Manufacturing Company.

Factories, Belding, Mich.

SALESROOMS AND WAREHOUSES:

Chicago, 223 5th Avenue.
New York, 260 Canal Street.
Philadelphia, 249 So. 2nd Street.
Boston, 90 Canal Street.
Holbrook, Merrill & Stetson, San Francisco and Sacramento, Cal., Pacific Coast Agents.

SEND FOR ILLUSTRATED CATALOGUE.



GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co , Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.
Lee-Clarke-Andreesen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Wm. Miller Range & Furnace Co., Cincinnati, O.
Doggett Dry Goods Co., Kansas City, Mo.

BUY THE BEST.

—THE—

Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,

GRAND HAVEN, MICH., U. S. A.

Write for our large Illustrated Catalogue for 1895.

All our goods are made of thoroughly kiln dried ash, finished in antique with Shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups All Refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

THE CHALLENGE ICEBERG,

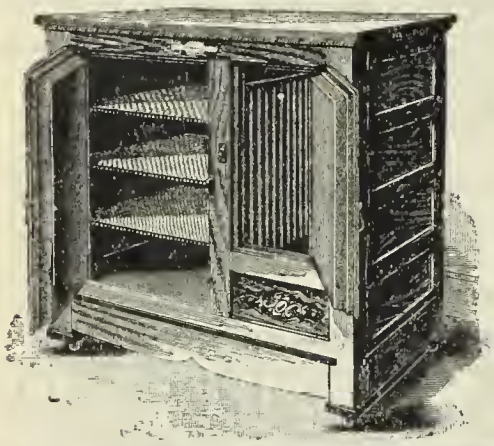
THE .·. HONEST .·. RELIABLE .·. REFRIGERATORS,

SELL THE BEST.

The Automatic Refrigerator

has more good points and does better work than any other and for that reason is a better seller.

Our illustrated catalogue for 1895 tells all about the line. Its advantages are:



Perfect circulation.
Large condensing and purifying capacity.
It has no flues to cause it to smell bad.
The trap is inside where it cannot be misplaced or lost.
The drip pipe may he cleaned without disturbing anything in either chamber, and is entirely out of the way
It has nine walls to protect the ice and to maintain a uniform temperature in the cooling chamber.
It has woven wire provision shelves that are superior.
It has superior hardware.
It is more capacious and convenient.
Flavors of foods will not mix.
Last but not least, it's different, and will bring new customers and new trade.

We want the leading dealers to sell our goods and but one dealer in a place.
The goods are made of ash, and well finished.
We have two factories, one in the East and one in the West, and are able to take better care of your trade than if we had but one.

For catalogue and discount address:

Illinois Refrigerator Co ,
909 Masonic Temple,
Chicago.
If West of Chicago.

Columbia Refrigerator Co.,
Northville,
Wayne Co., Mich.
If East of Chicago.



FROM DEALERS LOOKING FOR THE

Best Refrigerator Made

We solicit an opportunity of presenting the merits of our

"Wisconsin Peerless."

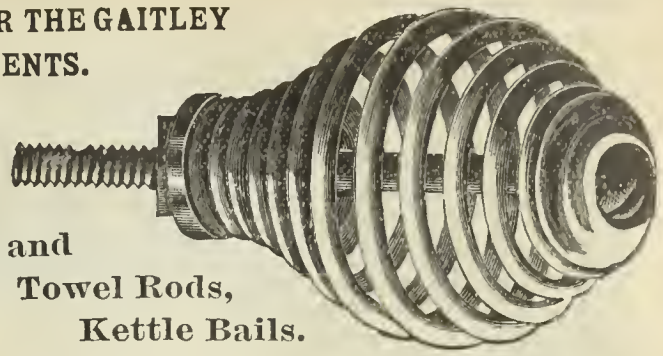
Mineral Wool Filling. Absolutely cleansable. More and better talking points than all other makes combined. Absolute guarantee. Seventh season.

For Catalogue address

The Wisconsin Refrigerator Co.
EAU CLAIRE, WIS.
New England Office,
175 Hanover Street, BOSTON, MASS.
Philadelphia Office,
Reeves & Smiley, 44 N. 4th St.

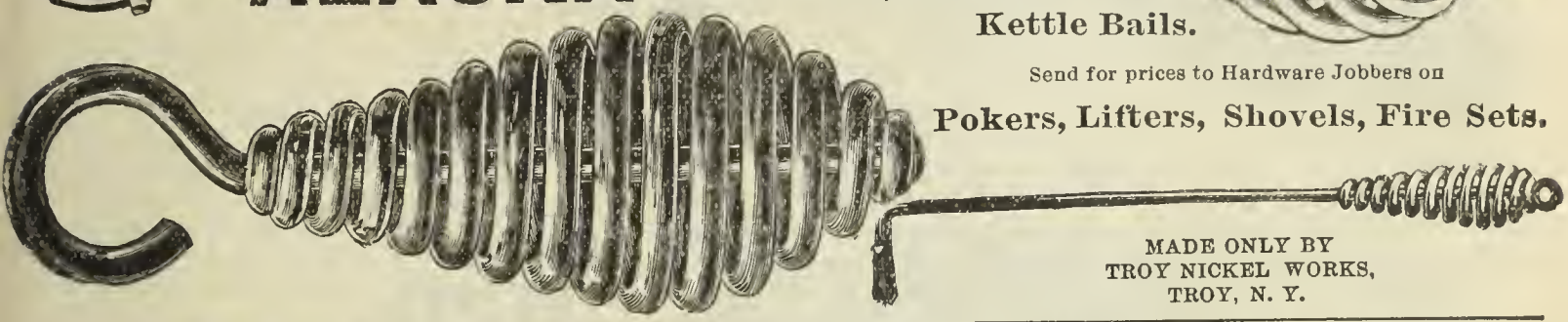


MADE UNDER THE GAITLEY PATENTS.



ALASKA

Stove Knobs and Handles, Towel Rods, Kettle Bails.

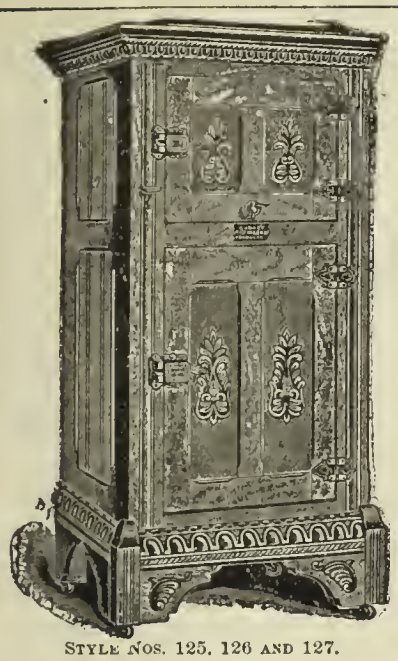


Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.

MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

"The Only Cleanable Refrigerator."



"Removable Galvanized Ice Compartment."

STYLE NOS. 125, 126 AND 127.

Gurney Patent REFRIGERATORS.

WE CLAIM FOR THE "GURNEY:"

"REMOVABLE GALVANIZED ICE COMPARTMENT."
"THE ONLY CLEANABLE REFRIGERATOR."
"CAN BE KEPT ABSOLUTELY PURE AND CLEAN FOR ALL TIME."
"THE LOWEST AVERAGE TEMPERATURE."
"THE GREATEST ECONOMY OF ICE."
"DRY AIR FREE CIRCULATION"
"PACKED WITH MINERAL WOOL (the best non-conductor.)"
"THE GREATEST SELLER."

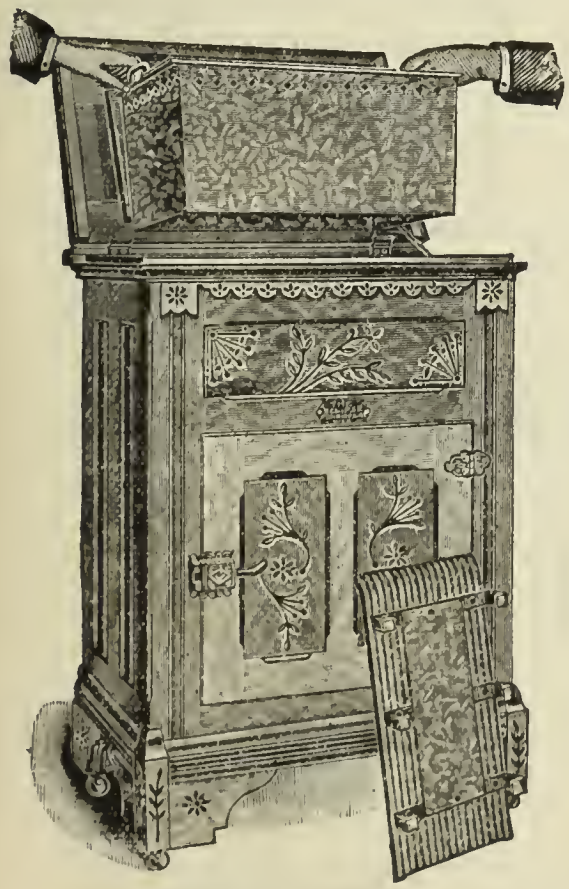
The "Gurney" Proves what we Claim.

The following Jobbers will handle the Gurney for the Season of 1895:

The S. M. Howes Company, Boston, Mass.
A. W. Martin, Baltimore, Md.
Supplee Hardware Co., Philadelphia, Pa.
Bindley Hardware Co., Pittsburgh, Pa.
Frank Diel, Syracuse, N. Y.
McIntosh-Huntington Co., Cleveland, O.
Indianapolis Stove Co., Indianapolis, Ind.
Chicago Stove & Range Co., Chicago.
Freeman Delamater & Co., Detroit, Mich.
LLEWELLYN BONHAM, our New York representative, Room 52 Pierce Building, N. W. corner Hudson and Franklin Streets.
Robert Seeger, St. Paul, Minn.
A. J. Lindemann & Hoverson Co., Milwaukee, Wis.
King Hardware Co., Atlanta, Ga.
O. K. Stove & Range Co., Louisville, Ky.
Heckel Hardware Co., St. Louis, Mo.
Howard W. Peak, Fort Worth, Texas.
Richards & Conover Hardware Co., Kansas City, Mo.
Tolerton & Stetson Co., Sioux City, Iowa,
Rector & Wilhelmy Co., Omaha, Neb.
McDonald & Willson, Toronto, Ont.

We want a jobber in every distributing point in the United States, and a dealer in every town and city.
Write for catalogue, terms and discounts, and secure the agency.

Gurney Refrigerator Co., Fond du Lac, Wis.



THE ECLIPSE HARDWOOD REFRIGERATORS.

Patented Separable and Removable Ice Compartment.

Can be kept perfectly clean with the least trouble.

It will pay you to write for Catalogue and secure the agency.

—THE—

Bowen Manufacturing Co.,

FOND DU LAC, WIS.,

SOLE MFRS.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE

THE BEST IN THE WORLD!

OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

At LOWEST PRICES EVER KNOWN.

If your dealer does not have them, Send for Illustrated Circular and Price-List, to

JOS. W. WAYNE,

MANUFACTURER,

124 MAIN STREET, CINCINNATI, O.

MICA

NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,

218 Water Street, NEW YORK.

— IN THE DIME MUSEUM.—Spectator: "Do you eat window glass, too?"

The Glass Eater: "I do."

S.: "I should think you would get a pane inside."

The G. E.: "I do; but my frame can stand it."

S.: "You pretend to relish what you eat?"

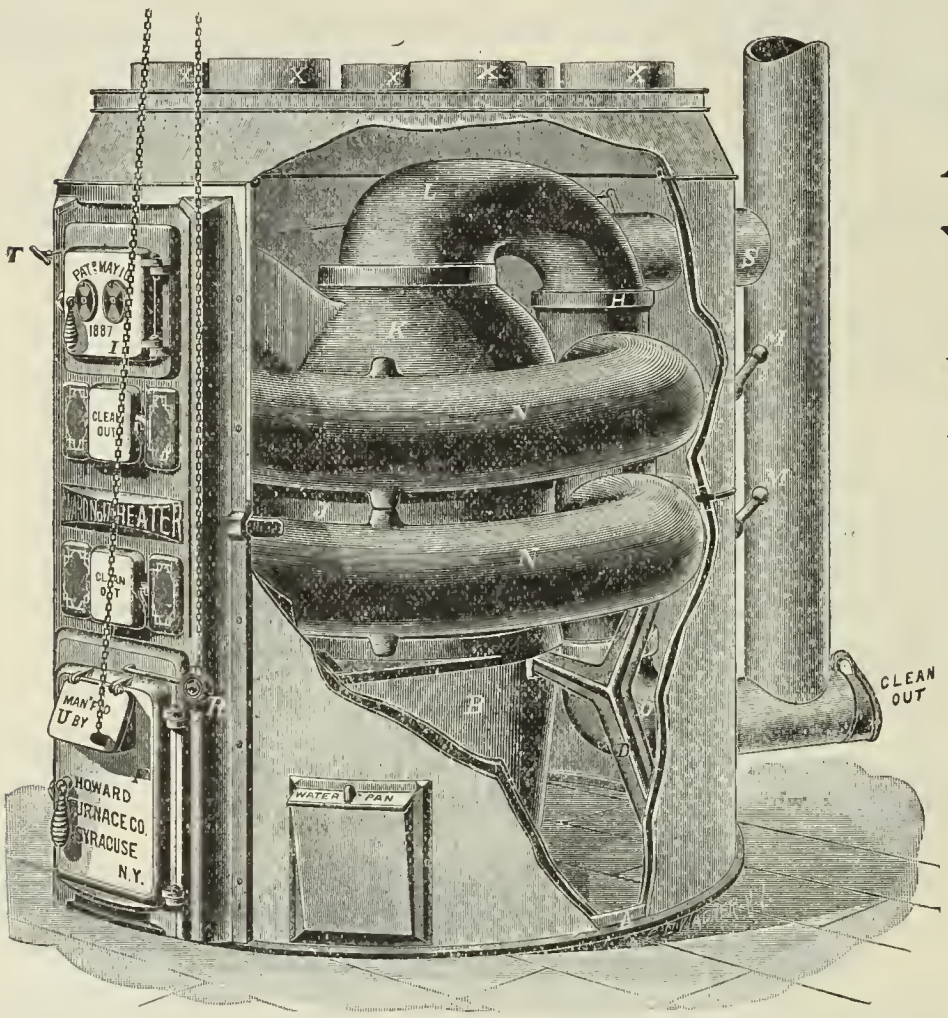
The G. E.: "That's only for a blind."

S.: "Do you wear that sash to advertise you specialty?"

The G. E.: "Yes."—*The Press.*

— A MAN should advertise as he would court a maiden—boldly and audaciously, yet judiciously and honestly, without too much stringency in the matter of expense. —*Printers' Ink.*

HOWARD FURNACES



Men Who Like

to see good work done on a Warm Air Furnace appreciate the fine points which the

HOWARD HEATERS

embody as a model to work from. When cased they only stand 44 to 66 inches high, according to size, and the advantages derived by being so low are worth due consideration.

SUPPOSE

you try one of these heaters. They embrace qualifications and merits of original character, which enhances their value and makes them rank high in the estimation of the trade as being above the ordinary class of heating apparatus.

HOWARD FURNACE COMPANY.

MAIN OFFICE
AND
WORKS,
SYRACUSE, N. Y.

●●●●●●●●

—BRANCHES.—

New York, 210 Water St.
Boston, 61 & 63 Blackstone St.
Grand Rapids, 38 So. Division St.
Toronto, 337 Yonge St.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, February 2, 1895.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.. ....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 5.
Index to Reading Matter.....Page 55.

Building Trades Exhibition.

The International Building Trades Exhibition will be held this year in Royal Agricultural Hall, Islington, London, England, from March 25 to April 4. This exhibition is for the purpose of making a representative display of materials and appliances connected with the building trades. Among the subjects specially mentioned by the International Building Trades Exhibition Company of 222 Strand, London, W. C., are brick and tile making, iron work, pottery, terra cotta, wood work, ventilation, heating, sanitary ware, decoration and paving. We understand that all branches of the building trades in London are co operating in the movement, and it is expected that the display to be held in April next will prove as pronounced a success as the one last held under the auspices of the company named. The consultative council, consisting of men of high repute in the professional and manufacturing world, are taking special interest in this exhibition for the purpose of securing a greater development of trade in connection with the building industry.

Overcrowded New York.

The problem of overcrowding in the poorer quarters of great cities has long engaged the anxious attention of social economists and philanthropists throughout the civilized world. It is unfortunately one of which the difficulties seem to grow more intense year by year. This fact is strikingly illustrated in the report of the special citizens' committee recently engaged in an inquiry into the tenement houses of New York City. This report brings out some interesting and startling facts connected with the extraordinary growth in density of the city's population within recent years. Only a few years ago, before the general adoption of the "flat" system, the average number of residents to a house in New York City was 14. Now, the average has risen so high that, in some sections of the city, it has reached four times that figure. In the Tenth Ward, for example, the average is 57 persons to a house, while in the adjoining ward, the Seventh, the number is 43 to a house. The tremendous density of the city's population, more particularly on the east side of the town, is, of course, mainly due to the fact that, by improved modern methods of construction, builders have been enabled to utilize the available space much more profitably—to the owners and landlords—than formerly. Yet, taking into consideration the additional accommodation skyward thus provided, the actual accretion of population has far outstripped the enlarged accommodation.

Health and Morals.

The Tenth Ward of New York City, previously referred to, has, for instance, with an area of 110 acres, a total population of nearly 70,000. This is at the rate of about 636 persons to an acre, an average certainly in excess of any section of like size in any other city of the United States and an exhibition of crowding which is hardly to be rivaled in the world. The difficulty of securing and enforcing adequate sanitary measures under the conditions afforded by such a lamentable state of things as must exist among a community dwelling in such densely packed masses can be readily apprehended. That the sanitary laws of New York City are so well administered, and that the urban death rate is so comparatively favorable under these circumstances, speaks well for the city's health department. When, however, the moral aspects are regarded, of the herding together of human beings in such a manner, the situation of the masses in the thickly settled east side offers a problem which may well engage the most earnest and serious consideration of those to whom the future well-being of the race is in any degree a matter of solicitude.

Bids on Heating.

The steam or hot water heating contractor, in making up his estimates, naturally looks upon profit as an indispensable item; but he should not lose sight of the fact that the all important consideration is a careful and absolutely correct computation of the cost. The successful man in any line of business is he who never is deceived in the cost of any work for which he contracts. Long experience is often the only qualification that may be safely relied upon for calculating the cost where the work is difficult or its character precludes a perfect idea of the labor required being formed until the job is under way. In digging a pit for a boiler recently a spring was struck by the contractor, and, as a cast iron contract had been made, it cost more to dispose of the spring successfully than the entire price of the job, profit and all. Such things will occasionally be met, but in the majority of cases the only obstacle to a correct estimate of the cost being made is a want of care in making it up. It is a work that requires patience, a thorough acquaintance with the price of material and thorough practical knowledge of how the work should be done in order to foresee expensive details that would otherwise be overlooked. As a rule, too little time is given to making estimates. It is tedious work and not inviting to those who eagerly take part in the solicitation and sale. Few are ready and willing to go carefully over a cost calculation and the list of items to see if it is correct, or if anything has been omitted that should be included, and whether good judgment has been used in setting a price on the labor, cartage and incidentals. After this work has been carefully done, very few business men will omit to add a profit.

In a paper on prepayment gas meters recently read by Mr. Nasmyth before the Manchester Engineers' Association, the author states that the adoption of these meters in England has more than made up for the diminished gas consumption of those who have adopted the electric light. In Liverpool 12,000 of these prepayment meters are now in use. In London each meter is the means of selling from 10,000 feet to 20,000 feet of gas every year ; and in Croydon, by their means, the consumption of gas has increased 16,000,000 feet in a single year.

The marked decrease in immigration into the United States last year is illustrated by the report of the landing agent at Ellis Island, New York, which shows that during the year 1894 188,-164 steerage and 92,561 cabin passengers were landed at this port, the smallest number since 1878. The following table shows the total arrival of immigrants in the past ten years:

1885	395,346
1886	334,203
1887	490,109
1888	546,889
1889	444,427
1890	455,302
1891	560,319
1892	623,084
1893	502,917
1894	188,164

THE LETTER BOX.

Squaring the Circle.

From J. L. S., *Catasauqua, Pa.*—I send you herewith an account of how the circle is squared by M. Roche, Ph.D., of the Polytechnic Nautical and Mechanical College of Philadelphia. Given any circle to construct a square that shall be in area equal to it. Let a horizontal line be drawn tangent to the circle. Revolve the circle on its circumference until the original point of tangency touches the line again. Then will the distance between the two points be exactly equal to the circumference of the circle. Bisect this distance and draw a perpendicular equal to the radius of the circle and complete the rectangle, which will be exactly equal to the area of the circle, for it will be one-half of the circumference multiplied by one-half of the diameter. The description and the diagram, which is copyrighted, further shows how to change this rectangle into a square.

Note.—We are very glad to print this interesting communication showing that a mechanical method has been devised for approximating the area of a circle. We cannot, however, consider this a method of squaring the circle. Our correspondent, of course, is aware that a man might take a tape measure and measure the circumference of a circle and multiply it by one-quarter of its diameter and the result would be the area. The point is to solve it mathematically. We might say that to find the area of a circle it would only be necessary to cut a sheet of lead to its exact size, then remold it into a square, and measure the square. Or, take a lot of shot and squeeze them from the form of a circle into that of a rectangle. All of these methods are more or less approximate, but they do not come within the definition of squaring the circle. Our correspondent will readily perceive that with the relationship between the diameter and circumference known to over one hundred decimal places, there will be less error in calculating the area according to the old fashioned rule than there would be in applying a mechanical method such as here described.

From A. T. N.—I notice in *The Metal Worker* of January 19 that a reader wishes a method for squaring the circle. I have a book wherein Rufus Fuller, 255 Tremont street, Boston, Mass., claims to have discovered the exact relation between the diameter and circumference of the circle, which he says is as 1 is to $3\frac{3949}{27889}$; in other words, when the diameter of a circle is 1 inch the circumference is $3\frac{3949}{27889}$ inches.

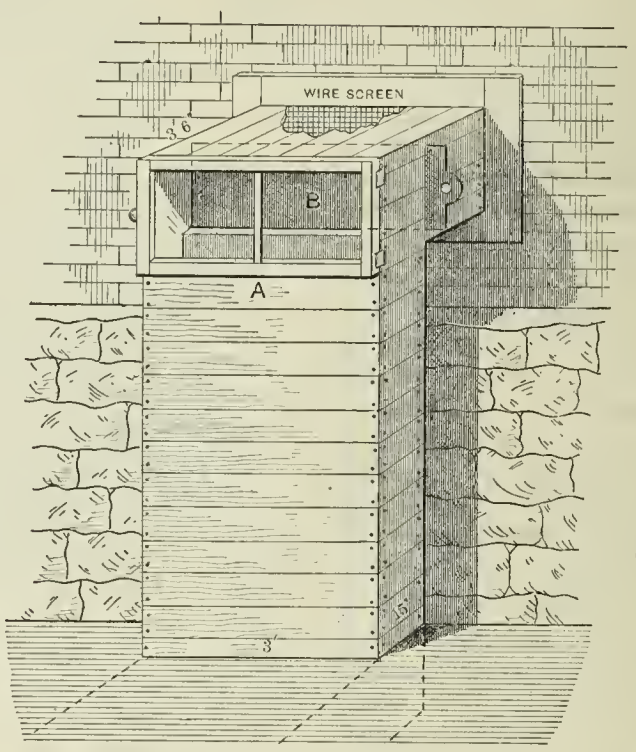
Note.—This is an interesting statement that our correspondent furnishes, but unfortunately the fraction he gives does not agree with the approximate numbers that have been previously determined. The relation between the diameter and circumference is expressed by an indeterminate decimal which has been carried out, as we have stated, to over one hundred decimal places, beginning in this way 3.141592653589. If our correspondent will compare this with the fraction that he has quoted he will find that after the fifth decimal place the two do not agree, so we fear the fraction is not correct. The commonest fraction is $\frac{22}{7}$. This agrees for two decimal places and is near enough for many practical purposes.

Since the above was written we have received a letter from E. M. Lang & Co., Portland, Me., referring likewise to the book of Rufus Fuller and giving his rules as they appear. The first is the same as the one above quoted, while the second one reads as follows: "Multiply the given diameter of the circle by 148, divide the product by 167, and the quotient is the length of one side of the square that contains the same area as the circle." This, however, is simply another way of putting the former statement, and consequently contains the same error.

A Cold Air Duct.

From J. L., *Pittsburgh, Pa.*—I send you a sketch of a combination cold air duct and light shaft, which can be connected with the same window and supply a furnace with air and the cellar with light. I trust it may be of some value to the readers of *The Metal Worker*. The duct is made of matched flooring boards, with a sash hinged at the top in the same manner as a transom, as shown by A of the sketch. If under the influence of some winds the hot air is inclined to be discharged out of the cold air duct, the sash door at A can be opened and the slide shown at B kept shut, preventing the escape of hot air and providing for a cold air supply to be taken from the cellar until the wind changes. I would like some of the readers of *The Metal Worker* to suggest a plan for an air filter for such a duct; also give the name and address of some manufacturer of such an apparatus.

Note.—We should be glad to have our readers contribute anything that they have tested for filtering air. In *The Metal Worker* of October 28, 1893, such an apparatus was described, the Farquhar Heating Company, 61 Dearborn street, Chicago, Ill., making an apparatus for this purpose.



A Cold Air Duct.

Heating from Stove Coil.

From W. F. S., *Bayfield, Wis.*—The hot water heating plant which I placed in a barber shop according to instructions given in *The Metal Worker* December 1 is giving such satisfaction with the weather 10° and 15° below zero that it encourages me to ask some more questions on that system of heating. I am thinking of heating, or assisting my coal stove to heat, my dining room from a coil in the water front of my cooking stove or range, which is a No. 8. I am making my water front out of $\frac{3}{4}$ inch gas pipe and return bends. I cannot use larger pipe as it would take up too much space in the fire box. There will be four pieces of pipe 20

inches long exposed to the fire. I will connect the water front to a 30 gallon boiler and run flow pipe from top of the boiler to a coil of 1 inch pipe in the dining room. What I wish to know is, what size should I use for flow and return pipe from the boiler to the radiator; would it be practicable to use pipe larger than ¾-inch when my water front is only ¾-inch pipe? The distance from the boiler to the radiator is 10 feet, but three turns will have to be made in the return from the radiator, and it will have to run under the floor owing to a door. In making the return I will connect with the water back with a Y-fitting.

Answer.—The pipe coil which our correspondent intends to place in the stove will present a surface of about 2½ square feet. This character of surface will in all probability take care of 25 square feet of surface in the radiator for each foot of surface in the coil, or about 60 square feet in all. A ¾-inch pipe would give very fair service as a flow and return to a radiator of this size. There is no reason, however, why the flow and return pipe should not be larger, and as the radiating coil is to be 1-inch pipe, the flow mains may be made of the same size without disadvantage. The turns that will be made in the return pipe and the distance which it has to rise to connect with the water back, and the fact that the radiator is on the floor, will all hinder a lively circulation, but if the job is piped with a fall in the main from where it leaves the boiler to the radiator, and a fall in the return pipe all the way from the radiator to a point where it rises and connects with the pipe coil in the stove without air traps or low places, our correspondent may be successful in making the job work.

Purifying Cistern Water.

From M. A. X., *Cane Creek, Tenn.*—Please inform me, through the columns of *The Metal Worker*, what you know about a contrivance or invention by which cistern water can be cleansed without drawing the water off. A customer called to day and stated that such a thing was in existence.

Note.—We do not know to what device our correspondent refers, and if any of our readers know of such a thing we shall be glad to have them write us for this correspondent's benefit. It is not impossible that the scheme is to purify the water by carrying air down into it. This has been done on a large scale in water works reservoir with good results. The oxygen of the air destroys the impurities in a large measure and under certain conditions we presume this method could be followed for purifying cistern water.

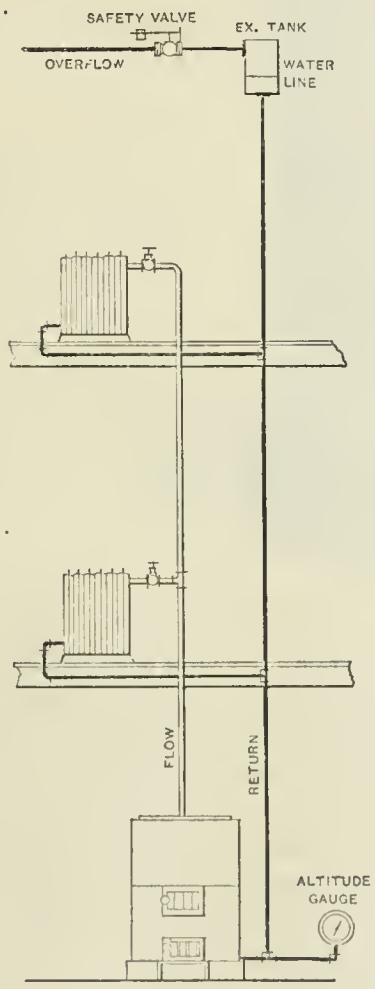
How to Make Gold Plentiful.

From CORNICEMAN, *Chicago.*—I am much interested in the currency discussion now going on in the columns of our daily papers, but much of it seems to me to be devoid of common sense. I believe the whole question would be solved by a very simple enactment that on and after a certain date, a reasonable time hence, all debts exceeding say $25 should be payable one-half in gold at the option of the creditor. There would then be such a demand for gold that it would be, for a time at least, more profitable to import than to export it, and after gold again became abundant occasional exports would not excite a ripple of comment.

Pressure and Circulation.

From J. H, *Springfield, Mass.*—I submit two sketches of hot water heating plants about which I would like some information. If the hot water plant shown in Fig. 1 was filled with cold water to the dotted line in the expansion tank and the safety on the overflow set to open at 1 pound and the altitude gauge at the bottom of the boiler registered 21 pounds, what would the altitude gauge register if the lever on the safety valve was weighted so that no water would waste until 26 pounds pressure was developed at that point, and the plant was heated up and the safety valve wasting? Will a plant work piped as shown in Fig. 2 with the first radiator having both the flow and return connected to the flow main and the radiator above being connected with the flow main and its return connecting with the pipe to the expansion tank—will the first radiator get hot water? I have seen a plant piped in this way.

Answer.—In reply to the first query the pressure that will be shown on the altitude gauge will be the natural pressure due to the hight of the water col



Pressure and Circulation.—Fig. 1.—A Question of Pressure.

umn plus the 26 pounds pressure secured through weighting the safety valve, or a register of 47 pounds on the altitude gauge. In reference to the second query, the radiator that is placed highest on the system will undoubtedly secure a much better circulation than the lower radiator, and it is probable that if the return from the lower radiator was connected with the return from the

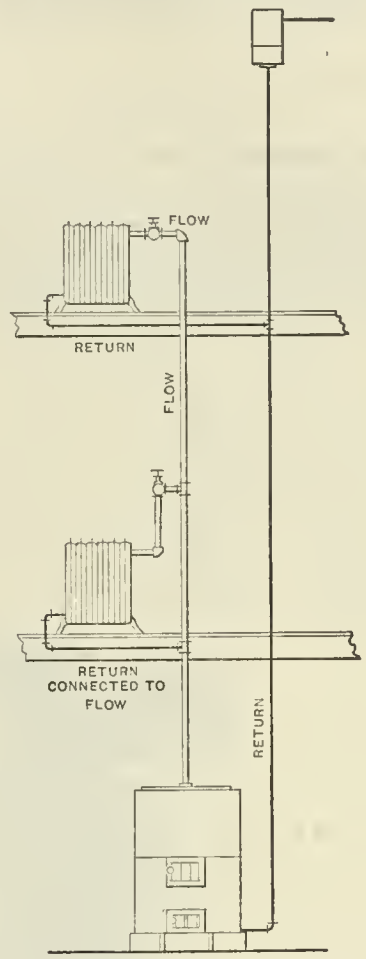


Fig. 2.—A Questionable Connection.

expansion tank better results would be secured. Further discussion on these inquiries is invited.

Insurance Rates on Gasoline Stoves.

From C. P. A., *Port Ewen, N. Y.*—I would like to ask the following question through the columns of *The Metal Worker*, as it may be of interest to some of my fellow workmen. Some time ago I purchased a gasoline soldering furnace for the shop and now my insurance agent says I must pay $2.50 extra if I burn it. I am already paying $18 75 per $1000 for one year and I think it is an outrage to ask for any more. If any of my fellow workmen have had any such experience I would like to know how they came out.

Question of Gas Pressure.

From G. E. S., *Pennsylvania.*—I am interested in a gas plant in this place. Our pipe line crosses a bridge, and at some periods of the winter we are annoyed by the reduction of the pressure during the cold weather. I think it is caused by hoar frost. The pipe is 6 inches in diameter. I would like to have an opinion from your readers who have had similar experience, and would ask them to give their views as to the best means of preventing the trouble.

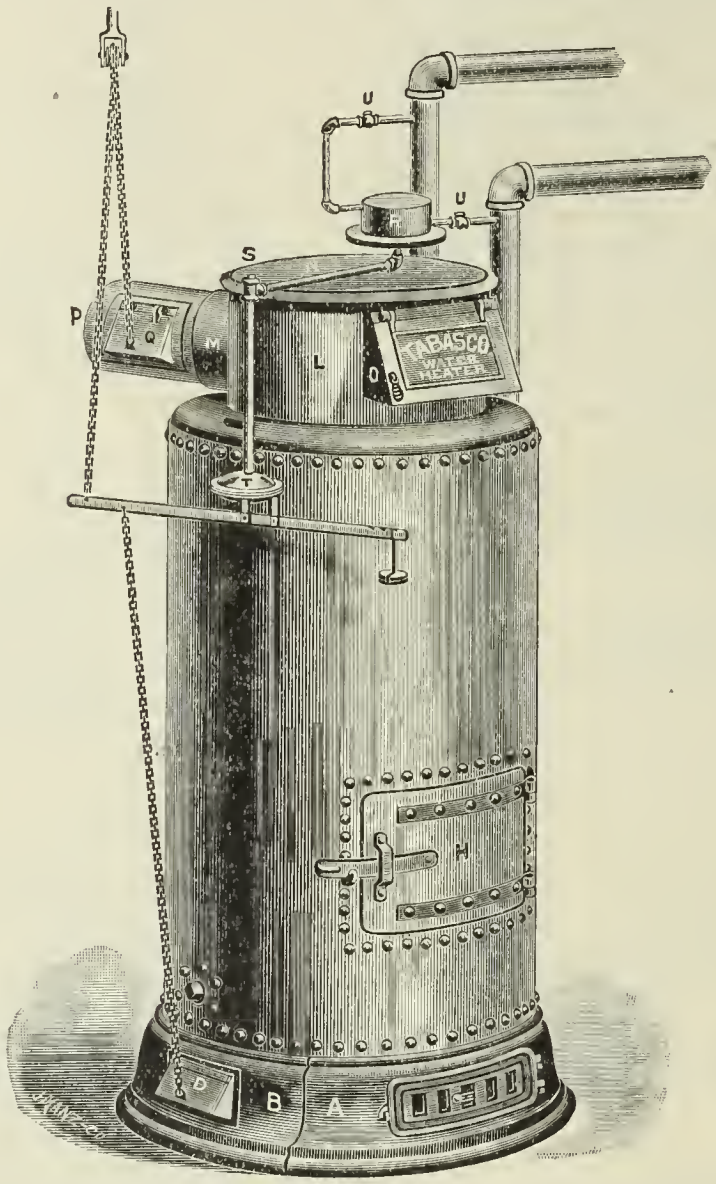
Furnace Pipe Rule.

From H. T. G.—I would be very glad if some of the practical readers of *The Metal Worker* would tell me a rule for obtaining the size of pipe and register necessary to admit a certain quantity of air per hour into a room, the temperature of the air to be delivered being known.

STEAM AND HOT WATER.

The Tabasco Water Heater.

The accompanying illustrations show a general and sectional view of the Tabasco water heater manufactured by the Kewanee Boiler Company, Kewanee, Ill., with Chicago office at 96 Lake street. Fig. 1 is a general view of the boiler, showing its appearance and the automatic temperature regulator, while Fig. 2 is a sectional view illustrating the water spaces, the magazine feed, &c. This heater is especially adapted for heating water for bathrooms, laundries, hotels, flats, baptistries, &c., special claim being made for its simplicity, ease of management and safety. The heater is made of two plates, with one steel head and inside loose fuel magazine, which is easily dropped into place and removed when necessary. The grate can also be taken out without breaking the connections of the heater, and the whole apparatus, it is pointed out, can be put together as easily as a stove. The water ways, it is mentioned, are all vertical, there being no cross currents. All the fire surfaces likewise are vertical and directly over the fire. The boilers are all tested to 110 pounds water pressure before leaving the works. Special attention is directed by the manufacturers to the automatic temperature regulator shown attached in Fig. 1. The regulator pot R is a double shell, the intervening space being filled with water, and this water chamber is connected to the flow and return pipes at the most convenient points, so that the water from the heater flows through it. The inner shell is filled with air, and connected to the diaphragm T, the upper part of the diaphragm being filled with water at the plug S. The variation in the temperature of the water in the heater varies the volume of air, which, acting on the copper diaphragm, opens and closes the draft door D and the check draft Q. A proper adjustment of the weights on the diaphragm lever will, it is stated, regulate the temperature of water, within a very few degrees, and the rooms to be heated can be kept at any desired temperature without other attention than occasionally filling the magazine with coal.



The Tabasco Water Heater.—Fig. 1.—General View.

A. C. Edgar of the Model Heating Company, Philadelphia, and Percival H. Seward of the American Boiler Company, New York, were visitors at *The Metal Worker* office recently.

Heating and Drying by the Use of Exhaust Steam and Live Steam Reduced to Low Pressure, Either Separately or in Combination.*

BY ALFRED A. HUNTING, BOSTON, MASS.

Heating and Drying by the use of steam in a primitive way dates back to the time of its being first successfully used for power. Boulton showed by actual use that exhaust steam could be carried long distances in pipes and that a high temperature could be developed in drying rooms by its use.

Steam for heating has been a favorite study with many engineers, and such use has been highly developed in certain lines, especially in high pressure work, while less attention has been paid to the utilization of exhaust steam and heating at low pressure on a large scale. Heating by exhaust steam has been a bone of contention, many arguing that it was absolute waste to attempt it, that it was much more economical to allow the exhaust to go to waste, and that it was better to have a free exhaust and to do the heating by live steam. The plan of piping to use exhaust steam for heating and drying, as generally designed, causes a back pressure at the engine. This is especially true of the early work in this direction, where 10 to 15 pounds back pressure was used to force the

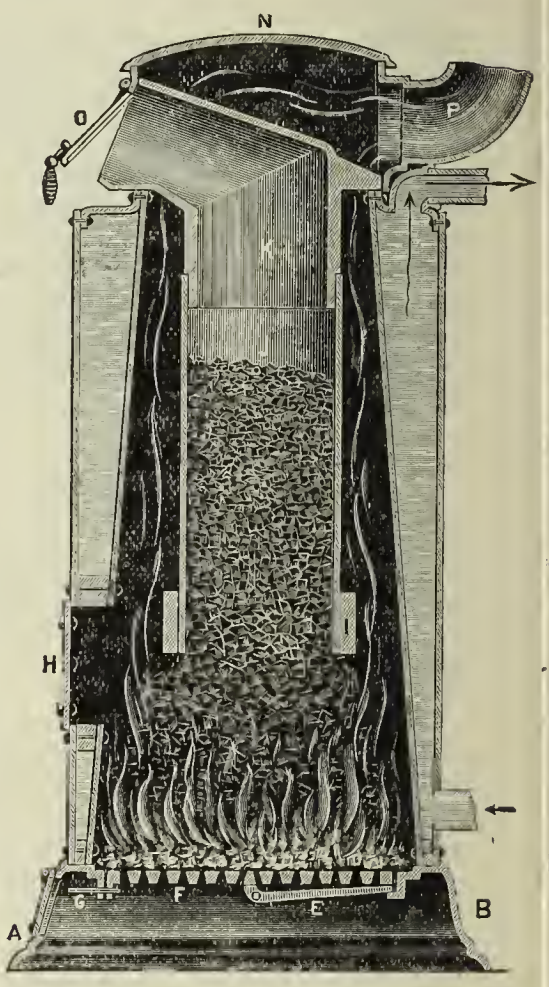


Fig. 2.—Sectional View of Heater.

* Presented at the New York meeting of the American Society of Heating and Ventilating Engineers, January 22–25, 1895.

steam through a system. Even to day it is not unusual to find similar conditions. Lately plans have been put up to work with only 2 or 3 pounds of back pressure. It is wasteful to heat with exhaust or live steam above atmospheric pressure under ordinary circumstances, even where the plants are of the largest description. It needs no argument to prove that back pressure at an engine is a loss in the ratio of back pressure to mean effective pressure, especially when better results can be obtained by the use of exhaust steam, all back pressure being removed from the engine and the engine actually working under a vacuum, which can be shown by indicator cards and by gauges.

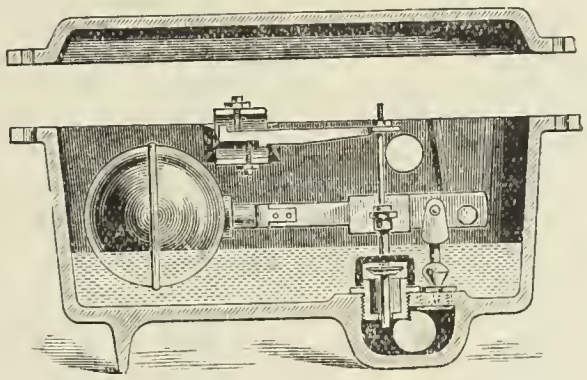
Steam heating plants vary in conditions, no two plants being just the same. There is no cast iron rule to be laid down by which they should be designed or by which they should be operated. Where engines and pumps are used, the steam which passes through them gives up a certain amount of heat units in power, still retaining, however, more of the said units than is generally sufficient for heating, drying, or for kindred purposes, even after passing through a feed water heater, and heating the water to a point near boiling. It has been satisfactorily shown in practice that steam at a pressure at or below the atmosphere heats the system more uniformly; that products of manufacturing processes are increased and at the same time; that a large saving in fuel and other economics is effected. Given a building of certain dimensions which is to be used for a purpose requiring steam for power, heat, and other purposes wherein the cost of steam for power is the same as the cost of steam for heating and other purposes, the two costing, say, $10 per day. Now, use the exhaust steam for heating and other purposes, and your bill for steam is cut in two, making it $5 per day. The saving will be greater or smaller according to the size of the plant and the amount of exhaust steam utilized. In cases where the uses to which exhaust steam can be applied are greater than the production, then live steam at a pressure corresponding to the exhaust steam, *i. e.*, atmospheric pressure, can be fed into the system to make up the deficiency, the two working in perfect combination and causing no back pressure.

In many cases where exhaust steam and live steam are fed into a heating system, usually run under pressure, the exhaust steam goes to waste, the live steam doing heating, by which practice the cost of heating is doubled instead of being lessened, as was the intention. There are many cases where small engines and pumps exhaust into one main exhaust pipe, the terminal pressure of no two of them being alike. Under these conditions (where a system is properly designed) the steam may be perfectly utilized for heating and drying without causing a back pressure on any one of the combination of exhausts. In a well devised system the water of condensation should all be returned to the boiler. There will, of course, be a small loss, but by the use of care the water bill may be reduced to a small item. In plants where the engines and pumps are stopped at night, the heating can be done by steam at reduced pressure from the boiler direct. This keeps the building perfectly heated, both by day and by night, which is a more economical practice than to allow it to cool off during the night to be heated again in the morning.

In the ordinary steam system run at moderate pressure, bubbles of air form on the interior of the pipes, radiators or dryers. After a time, if there are impurities in the water, the pipes and radiators are covered with scale, which covers the bubbles as well as the rest of the interior of the heating or drying surface until the whole interior is coated with a first-class insulating material, the heating surface losing in efficiency as such coating increases. Such an interior coating also retards the flow of condensed water. Water in pipes acts as a condenser and abstracts heat that should be given out through the heating surface. When it is attempted to remove air and water in the ordinary way (that is by pressure), a large per cent. of the heating surface remains inoperative, because such air and water are not properly or efficiently removed. Results count. The best system gives the best results. In a large office building in Boston, where it was supposed that everything had been done in a manner conducive to best economy in coal consumption and the general operation of the whole heating plant, a saving was made over the previous year, in four months' time, of over $1000. How was this done? Simply by the removal of air from the heating system, relieving the engines and pumps from all back pressure, and by discontinuing the use of live steam. The manner of piping and method of working in this case gives the results. It is equally effective whether exhaust or live steam at or below the atmosphere is used, or where steam at pressure is found to be necessary.

The Onderdonk Combination Steam Trap.

In the illustration presented herewith we show the Onderdonk combination steam trap manufactured by the Onderdonk Heating & Ventilating Company, 520 Commerce street, Philadelphia, Pa. This trap is designed to overcome flooding, and at the same time to prevent the escape of steam, both the inlet and outlet being large. The outlet is controlled by a valve, which is connected to a lever arm by an expansion spring. When only water is returned to the trap this outlet remains wide open and allows the water to discharge from the trap as fast as it enters. As soon as the steam enters the trap the springs are expanded and this outlet closes, and the condensation is then controlled by the float and is discharged through a much smaller aperture. The fact that the water is discharged through the larger port as soon as it becomes cooled prevents the possibility of the trap becoming frozen. The trap can be used to bleed high pressure mains, and it is not necessary to provide a by-pass around it, the expanding port serving the purpose. In operation it is claimed that the trap will return a very large amount of condensation, and will also serve as an air vent for a heating system. The trap is made in five sizes to control from 1400 to 12,000 square feet of pipe or heating surface.



The Onderdonk Combination Steam Trap.—Sectional View.

The Literature of Heating and Ventilating.

At the New York meeting of the American Society of Heating and Ventilating Engineers, held January 22 to 25, an interesting paper on the literature of heating and ventilation was presented by Hugh J. Barron of New York, from which we quote as follows:

I think it advisable at this place to insert a list of all the literature on this subject that I have been able to secure the use of. I have divided this list into three parts, the first consisting of books, the second part of essays, and the third of catalogues. I have excluded everything that does not pertain to the arts of heating and ventilating as a special field of effort, and I have been particular to avoid the scientific aspects of the subject of heat and of steam engineering. I have, as far as possible, given the dates when the works were published. There will, of course, be some errors, due to different editions of the same work and other causes. These lists, I am satisfied, do not contain half the works that have been published; many are lost; more are inaccessible.

In the development of the arts no work of man is to be despised; even the most rubbishy is interesting as a milestone on the march of human progress. Philosophers now generally realize that the histories of nations are in their arts and their literatures. The true history of this special art is in its literature, and when that is carefully examined it will be found that its development has been due to the thousands of unknown workers that have been engaged in it, and that any one man's share in the advancement has been very small indeed.

Books.

A Treatise on the Economy of Fuel and Management of Heat. Robertson Buchanan, C.E. Glasgow, 1815.

Conducting of Air by Forced Ventilation. Marquis de Chabannes. London, 1818.

The Principles of Warming and Ventilating Public Buildings, Dwelling Houses, &c. Thos. Tredgold, C.E. London, 1824.

Warming, Ventilation, and Sound. W. S. Inman. London, 1836.

The Principles of Warming and Ven-

tilating by Thos. Tredgold, with an appendix. T. Bramah, C.E. London, 1836.

Heating by the Perkins System. C. J. Richardson. London, 1840.

Illustrations of the Theory and Practice of Ventilation, with Remarks on Warming. David Boswell Reid, M.D. London, 1844.

A Practical Treatise on Warming by Hot Water. Chas. Hood, F.R.S. London, 1844.

History and Art of Warming and Ventilating. Walter Bernan, C.E. London, 1845.

Warming and Ventilation. Charles Tomlinson. London, 1844.

Walker's Hints on Ventilation. London, 1845.

Practical Treatise on Ventilation. Morrill Wyman. Boston, 1846.

Traite de La Chaleur. E. Peclet. Paris, 1848-59.

Practical Method of Ventilating Buildings, with an appendix on Heating by Steam and Water. Dr. Luther V. Bell. Boston, 1848.

Warming and Ventilation. Chas. Tomlinson. London, 1850.

Practical Ventilation. Robert Scott Burns. Edinburgh, 1850.

Ventilation and Warming. Henry Ruttan. New York, 1862.

A Treatise on Ventilation. Robert Ritchie. London, 1862.

American Edition of Dr. Reid's Ventilation as Applied to American Houses, edited by Dr. Harris. New York, 1864.

A Treatise on Ventilation. Lewis W. Leeds. Philadelphia, 1868; New York, 1871.

Observations on the Construction of Healthy Dwellings. Capt. Douglas Galton. Oxford, 1875.

Practical Ventilating and Warming. Jos. Constantine. London, 1875.

Warming and Ventilation. Chas. Tomlinson. London, 1876. Sixth Edition.

Mechanics of Ventilating. Geo. W. Rafter, C.E. New York, 1878.

Ventilation. H. A. Gouge. New York, 1881.

Ventilation. R. S. Burns. Edinburgh, 1882.

American Practice in Warming Buildings by Steam. Robert Briggs. With additions edited by A. R. Wolff. New York, 1882.

Steam Heating for Buildings. W. J. Baldwin. New York, 1883. Thirteenth edition published in 1893.

The Principles of Ventilation and Heating. John S. Billings, M.D. New York, 1884.

Heating by Hot Water. Walter Jones. London, 1884.

A Manual of Heating and Ventilation. F. Schuman. New York, 1885.

Ventilation. W. Butler. Edited by Greenleaf. New York, 1888.

Steam Heating Problems from the Sanitary Engineer. New York, 1888.

Metal Worker Essays on House Heating. New York, 1890.

Heat—Its Application to the Warming and Ventilation of Buildings. John H. Mills. Boston, 1890.

Ventilation and Heating. T. Edwards. London, 1890.

Ventilation—A Text Book to the Art of Ventilating Buildings. Wm. Paton Buchan. London, 1891.

The Ventilating and Warming of School Buildings. Gilbert B. Morrison. New York, 1892.

Hot Water Heating. Wm. J. Baldwin. New York, 1893.

Ventilation and Heating. John S. Billings, M.D. New York, 1893.

Warming by Hot Water. Chas. Hood, C. E. Edited by F. Dye. London, 1894.

Essays.

Chimneys and Fire Places. M. Gauger. 1700.

Suggestions in Regard to Steam. Colonel William Cooke. *Philosophical Magazine.* London, 1745.

Chimneys and Fire Places. Dr. Franklin, 1785.

Chimneys and Fire Places. Count Rumford, 1796.

Report of the Committee of the House of Commons on Acoustics and Ventilation. London, 1835.

Report of the Select Committee of the Journal of the House of Parliament. 1843.

Lectures by David Boswell Reid, M. D. London, 1856.

Hot Water Heating. John Eldridge. London, 1860.

Suggestions on Heating a House. John Brown. New York, 1865.

Paper by General Morin of Paris. in the Proceedings of the Institute of Mechanical Engineers. London, 1863 and 1867.

Proceedings of the Institution of Civil Engineers. Robert Briggs on Fan Blowers. London, 1869-1870.

The Plumber and Sanitary Houses. S. S. Hillyer. London, 1870.

Salltzer's Treatise on Acoustics and Ventilation. Alexander Salltzer. New York, 1872.

Reports of Petterkoff, Angus, Smith and Parkes. Investigations of London Houses. London, 1875.

Notes on Warming and Ventilation, by General Morin of Paris. South Kensington Museum. Proceedings of Science Conferences, 1876.

Proceedings of the Institution of Civil Engineers. London, 1877.

Ventilation. Robert Briggs. *Quarterly Journal of Science.* January, 1878.

On the Relation of Moisture in the Air to Health and Comfort. Robert Briggs. *Journal of the Franklin Institute.* January and February, 1878

Ventilation of Mines. W. Fairlie. 1880.

Heating of Halls of Audience. Robert Briggs. Philadelphia, 1880.

The Engineering Record and Sanitary Engineer. New York, 1879-1894.

Hot Water Heating. F. A. Fawkes. London.

Steam Heating. A paper read before the Engineers' Club of St. Louis, by Chas. A. Smith. *Journal of Engineering Societies.* September, 1882.

New Jersey State Board of Health. Reports for 1883. Dr. Hunt, Trenton, N. J.

On Warming and Ventilating. Arthur Morin. Smithsonian Institute. Translated by C. R. Young. Washington, 1884.

Parke's Manual of Hygiene. London, 1885.

Transactions of the Philosophical Society. Carnelly, Holden, and Anderson Reports. London, 1887.

Articles on "Heating," "Ventilation," "Baths," "Heat," Encyclopedia Britannica. London, Ninth Edition.

The Master Steam Fitter and Heating Engineer. Chicago, Ill., 1888.

Ventilation of Public Buildings, *Journal of the Franklin Institute.* Thos. Elkington. Philadelphia, 1889.

Reports of Massachusetts District Police. Chief Wade. Boston, 1889.

Ventilation. A. R. Wolf. New York, 1890.

The Heating of the State House, Augusta. Professor Woodbridge. Maine 1890.

Relative Economy of Chimneys and Fans. Professor Trowbridge. New York, 1890.

Hot Water Heating—Low Pressure. F. Dye. London.

The Heating and Ventilation of the Massachusetts Institute of Technology. Professor Woodbridge. Boston, 1890.

The Metal Worker. New York, 1890 to 1894.

Health and Comfort in House Building. Drs. Drysdale and Hayward. New York, 1890.

Heating and Ventilation. New York, 1893-1894.

Ventilation of School Buildings in Massachusetts. Joseph A. Moore. International Convention of Factory Inspectors. Chicago and Boston, 1893.

Engineers' Index. J. B. Johnson. St. Louis, 1893.

Proceedings of the Master Steam and Hot Water Fitters' Association of the United States. Conventions of 1892, 1893 and 1894.

Domestic Engineering. Chicago, Ill, 1894.

Catalogues.

A. M. Perkins & Son. London, 1845.

Walworth, Nason & Guilds. New York, 1850.

Morris Tasker & Co. Philadelphia, 1855.

Nason Mfg. Company. New York, 1860.

Hitchings & Co. New York, 1860.

Walworth Mfg. Company. Boston, 1865.

T. W. Weathered. New York, 1865.

Pancoast & Maule. Philadelphia, 1870.

H. Belfield & Co. Philadelphia, 1870.

John A. Scollay. Brooklyn, N. Y., 1870.

B. F. Sturtevant. Boston, 1873.

Walker, Pratt & Co. Boston, 1875.

New Haven Steam Heating Company. New Haven, Conn., 1878.

Crane Company. Chicago, 1878 to 1894.

Boynton Furnace Company. New York, 1880.

Holley Steam Heating Company. Lockport, N. Y., 1880.

Eureka Steam Heating Company. Rochester, N. Y., 1880.

W. B. Dunning. Geneva, N Y., 1880.

Utica Steam Gauge Company. Utica, N. Y., 1882.

Hay & Prentice. Chicago, 1883.

Haxtun Steam Heater Company. Kewanee, Ill., 1884.

Richardson & Boynton. New York, 1888.

Williames' System. Philadelphia, 1888.

Kelley & Jones Company. New York, 1888.

B. F. Sturtevant. Boston, 1888.

Pierce, Butler & Pierce. Syracuse, N. Y., 1888.

Gurney Hot Water Heater Company. Boston, 1890.

Osborne Steam Engineering Company. Chicago, 1890.

Babcock & Wilcox Company. New York, 1892.

Barnard Steam Engineering Company. New York, 1892.

Abram Cox Stove Company. Philadelphia, 1892.

New England Engineering Company. Boston, 1893.

National Electric Heating Company. Chicago, 1893.

A FIRE having destroyed the plant of the Pottsville Steam Heat and Power Company, Pottsville, Pa., numerous

dwellings and hotels that secured steam from them for heating purposes are now in an unhappy condition. Local heating men should be able to alleviate the discomfort by the prompt installation of a portable house heating boiler.

Heating and Ventilation of School Buildings.*

BY T. J. WATERS, CHICAGO, ILL.

The subject of heating and ventilation of school buildings is one which has been ably discussed from various standpoints by eminent heating and ventilating engineers for a number of years, and in view of this fact it is with a great deal of diffidence that I make the effort to address myself to the subject. It may safely be stated without fear of contradiction that a system of steam heating and mechanical ventilation, properly arranged and proportioned, is the one recognized as being superior to all others by the most advanced heating and ventilating engineers of the present time. A brief history, therefore, of the introduction of the first steam heating and mechanical ventilating apparatus in a Chicago public school may not be out of place, but rather of interest to the members of the American Society of Heating and Ventilating Engineers.

The building referred to is the Dore school, located on Harrison street, near Halsted street. The structure is brick, four stories high, and contains 16 class rooms, one office and two recitation rooms. It was erected in 1867, but the system of heating and ventilation was not finally determined upon until the building was nearly completed. The original intention was to heat by furnaces, but owing to the indefatigable efforts of W. J. Twohig, now with the Crane Company, but at that time of the firm of Walworth, Twohig & Furse, then leading steam heating contractors in the West, the Board of Education decided to take a step in advance of the times, and accepted the proposition of said firm, which provided for a system of indirect steam heating and mechanical ventilating apparatus, designed and installed under the direction and supervision of John Woodman, their superintendent. The apparatus consisted of two horizontal tubular boilers 42 inches by 12 feet; with 34 3 inch tubes each; four return bend coils of 1-inch pipe, each 22 feet long, 14 pipes high by 12 pipes wide. These coils were located in the basement corridor and inclosed in brick work. Each coil was connected with four rooms by means of two tin ducts which extended up in wardrobes and terminated in each room 12 inches above the floor, about 20 feet apart, with a deflecting hood arranged so that the current of air was directed downward. These hoods were also used to control the volume of air, as no switch damper was provided to regulate the temperature thereof. The corridors were also heated from these coils, there being four registers on the first floor. There were four 18-inch steam traps, "pot" pattern, one for each coil, which discharged the water of conden sation into a receiving tank, and from thence it was pumped into the boilers. The blower, 72 inches in diameter, was inclosed in a brick housing and was operated by a 9 x 14 inch engine. The blower was manufactured by Morris & Tasker Company of Philadelphia, and is still in use. For a period of seven years the heating apparatus gave fairly good results, when it was found necessary to remove the old coils, owing to the great number of leaks occasioned by rust in the form of pin holes. The coils would have lasted much longer, no doubt, had they been placed in a perfectly dry basement or kept in constant use.

The present apparatus in this building was designed by the writer, and consists of wrought iron staggered pipe radiators, one being placed at the base of each duct. In addition to these radiators, wall coils were placed in class rooms around the exposed walls under windows. The old boilers proved to be inadequate, and a few years after the coils were removed new boilers were substituted. A number of school buildings were heated in the manner just described three years prior to the removal of the old apparatus, and, in fact, all the school buildings heated by steam up to 1889 were heated practically in the same way. Since the installation of the first apparatus various improvements have been made, principally in the manner of introducing air, and also in the placing of switch dampers in blast ducts, thus enabling the teacher to regulate the temperature of the air without decreasing its volume. We have several buildings in which disk fans are used, one being a blast fan to distribute air through galvanized iron ducts suspended from the ceiling to the various indirect cast iron radiators, and from thence to class rooms by means of vertical ducts. The exit ducts from class rooms in these buildings are usually concentrated in a room in the basement, where an exhaust fan is placed to draw the air from the various rooms and expel it from the building. About three years ago the writer discontinued the use of the latter fan for all new work. After a series of careful experiments and observations in old buildings formerly heated by furnaces and subsequently equipped with steam heating and mechanical ventilating apparatus, blowers being used, it was found that satisfactory ventilation was obtained by the use of the old exit ducts which led from each class room directly through the roof. There can be no doubt but what a more positive movement of air may be obtained by the employment of an exhaust fan, but the objection to its use, however, aside from the additional cost lies in the fact that it has a tendency to create a partial vacuum in a room, thus allowing the cold air to rush in through openings around the windows. The warm air entering the room through the blast duct is also liable to be drawn too rapidly to the point of exit, thus subjecting the occupants to disagreeable drafts.

The question of drafts has been a source of annoyance to the writer for a number of years, more especially in buildings where mechanical ventilation is employed. Five years ago I determined to experiment on a new line in an old building which was being remodeled. The building is brick, three stories high, and contains 12 class rooms, an office and two recitation rooms. It was formerly heated by wall coils and a system of direct-indirect staggered pipe radiators, two radiators in each room, valved so that either one or both might be used. The radiators referred to were 4 pipes wide by 28 long by 34 inches high. It occurred to the writer that by placing one-third of the total amount of surface, eight radiators, between the outside air and the inlet to the blower, 72 x 42 inches, the air, after passing through these radiators, would be about 70°, consequently it may be readily seen that a change from the maximum, about 120°, to the standard minimum of 70° would be a decided improvement on the old method of using the air for tempering purposes at the temperature of the outside atmosphere. The balance of the radiators, 16, were placed on a suitable platform of wood in front of the blower outlet, arranged in three sections, 2 radiators wide by 2 high, and each section controlled by valves, so that any one or all might be used, as occasion required. The wall coils were allowed to remain, but are not used except in extremely cold weather, and then only in the morning until the building is properly heated. The blower is operated by an 8 x 12 inch horizontal slide valve engine. The exhaust steam is utilized in the heating apparatus, and cross connected in such a manner that it may be turned into radiators in the cold air chamber and also in the warm air distributing chamber, or to the 3-inch wrought iron vapor pipe from a cast iron catch basin, which extends up through the brick smoke stack to a point 3 feet above it. A pressure regulator is used on the heating main, and a pressure of from 1 to 5 pounds per square inch on the system is sufficient in the coldest weather to maintain a circulation in the radiators. The water of condensation is returned to a sealed tank made to withstand a pressure of 100 pounds per square inch. A water regulator is attached to the tank and connected with the city main to maintain a uniform water line. A duplex steam pump, 5¼ x 3½ x 5 inches, is used to force the water of condensation from the tank into the boilers. The steam heating apparatus proper is known to the trade as Waters' semi-gravity system, and was introduced to supplant steam traps seven years ago.

Since the introduction of the above system a saving of from 15 to 20 per cent. in fuel has been accomplished in some buildings from which the steam traps were removed.

The platforms in the cold air chamber, and also in the warm air distributing chamber, stand about 3 feet 6 inches above the basement floor, the space beneath the platform being used as a chamber for the tempered air. The entire chamber is inclosed in brick work, and a galvanized iron duct, 18 x 20 inches, leads therefrom on the basement ceiling, which connects with a vertical duct to each class room. These ducts have openings near the ceiling inside of the warm air chamber, in which a switch damper is located to regulate the temperature of the air passing through them. The ends of the ducts terminate at the bottom of the platform, full size, to receive the air at the minimum temperature. The dampers are operated automatically by the Johnson electric system of heat regulation. A damper is also placed in each duct to regulate the volume of air. It will thus be seen that when one of the switch dampers is closed against the air at the maximum temperature its volume through the duct is not diminished, and also the amount thus shut off from the top of the platform is exerted on all ducts open to its influence. The results obtained from this arrangement were so satisfactory that all new school buildings erected in the city of Chicago since 1889 have been provided with a heating and ventilating apparatus of this character. It is true that several minor changes have been made from time to time with a view to reach a higher

* Presented at the New York meeting of the American Society of Heating and Ventilating Engineers, January 22-25, 1895.

standard of perfection, but the essential features, as above described, still prevail. The style of radiator adopted for this work is 1-inch staggered pipe 4 pipes wide, 32 pipes long, by 6 feet high.

In designing an apparatus of this kind, care should be exercised in the location of blast and exit ducts. My practice for several years has been to introduce the incoming air toward the ceiling at a point about 7 feet from the floor line and to locate the exit ducts, whenever practicable, on the same side of the room as the former ducts. The size of each of these ducts will average 18 x 20 inches, or a cross sectional area of 2.5 square feet.

It is obvious that an amount of air sufficient to properly ventilate an ordinary class room, 25 x 32 x 14 feet, containing 60 pupils, must pass through a duct of the size given above at a velocity of 12 feet per second, or 720 fect per minute to furnish the required amount *per capita*.

Notwithstanding the fact that the minimum temperature of the air has been raised to a standard of 70°, drafts are in some instances perceptible to a disagreeable extent if the switch damper is closed against the air of maximum temperature when it is introduced at such a high velocity. Various devices have been introduced by the writer in the shape of deflectors, placed in front of the outlet of blast ducts in rooms to break up the current of air, but nothing approaching satisfactory results was obtained until quite recently. The latest device consists of a galvanized iron hood placed in front of the blast duct, which extends on both sides of the same, and presents a cross sectional area of 6 square feet. The current of air entering this hood is broken up placing two diaphragms, one on each side of the center of the duct, with a slight curve to each end of the hood. An open space of 6 inches is also left between the diaphragms, thus dividing the inflow of air into three equal parts and compelling it to pass in as many different directions from the hood, at an angle of 45° toward the ceiling. This device has been in operation since September 1 of the past year, and thus far I have not heard a complaint about drafts. The above arrangement reduces the velocity of the air through the same size duct at its terminus about 58 per cent., which fact is worthy of consideration by any person interested in this class of work. It is quite natural to suppose that a galvanized iron hood of such dimensions would look unsightly, but if properly made and painted a color to harmonize with the wall, it certainly ought not to be considered objectionable by the most fastidious. It has been found from actual experience and observations that 30 cubic feet of air per minute, or 1800 cubic feet per hour, *per capita*, is necessary in order to secure satisfactory results. The above fact was clearly demonstrated a few years ago in a class room which had a seating capacity of 60 pupils. Owing to the crowded condition of the building, however, 10 additional pupils were placed in this room. After school was in session about one hour it was found necessary to open some of the windows owing to the vitiated condition of the air. A short time after an additional room was fitted up to relieve the overcrowded one, and as soon as the extra pupils were removed there was no further difficulty experienced.

For some years past the tendency has been to decrease the number of sittings from 60 to 54. It is good practice, however, to provide a blower which will readily furnish the maximum amount of air required without forcing it to its full capacity, especially if it is placed within the building and under a class room. Engines or blowers operated at high velocities will transmit vibrations to walls and floor joists, which are objectionable. If brick walls are used around blowers, care should be taken not to have them touch the ceiling for the reason just stated. A space of 4 inches may be left between the ceiling and wall which can be filled in by means of a rubber belt or mineral wool, which will reduce the effect of vibrations to the minimum.

The boys' and girls' closet rooms erected during the past six years are isolated from the main buildings, but are reached by connecting passages from the basement rooms. Said closet rooms are heated by ceiling coils only, no indirect heat being used. The ventilation of these rooms is accomplished by a 36-inch disk fan and combination engine. The fan is located in an inclosed chamber at some central point between the closet rooms. A galvanized iron duct of suitable size is extended from a point near floor line in each room to a fan chamber, and from thence the air is expelled outside of building. Until three years ago it was the practice to heat the said rooms by direct and indirect radiation, but the latter was abandoned because it was found impossible to keep the doors closed leading to the basement rooms. As a result the slight pressure occasioned by the blast from the indirect chamber caused an outflow of air from the closet rooms when the doors were opened, which invariably found its way to the corridors and ultimately to the class rooms. If closet room doors remain open now, the air moves in the right direction, or just the reverse of its former course whenever the fan is in operation.

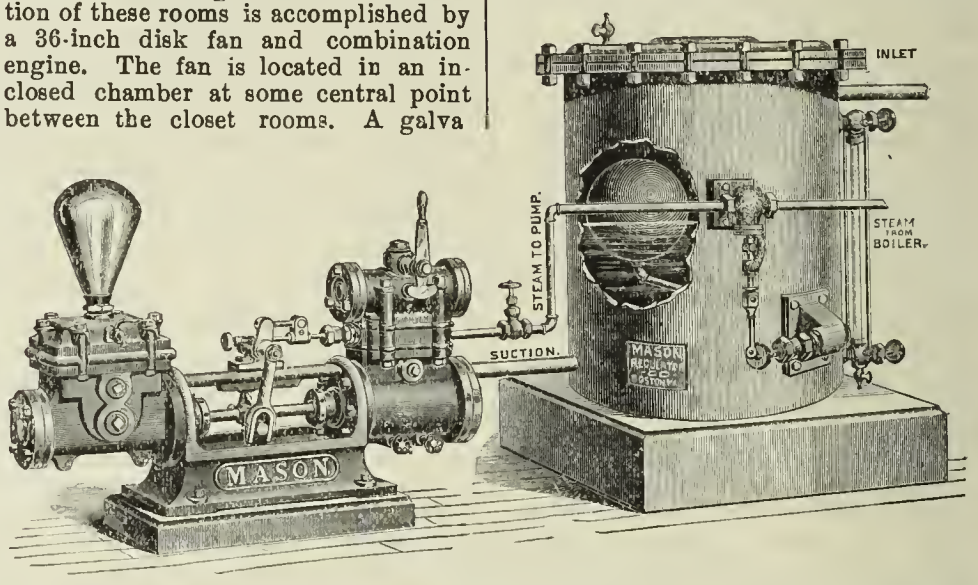
During the present year I decided not to specify wall coils for class rooms of new buildings. The only direct heat now being used is in the shape of radiators located in the first and second story corridors. Doors are provided in the cold air chambers, so that air may be taken directly from the building in the morning up to about one-half hour before sessions begin. The exit ducts from the rooms are brought together in the attic and connected to a circular duct which extends through roof, properly capped. In some of the large buildings there are two ducts, as described. A damper is placed in the said ducts in such a manner that they may be operated by the engineer by means of a cable which extends to the basement. These dampers are kept closed in the morning, thus avoiding the introduction of cold air through exit ducts. When air is introduced from outside of the building the dampers in the exit ducts are then opened. A building can be heated in this manner at least one hour earlier than it is possible to heat it by taking air directly from outside, which means a considerable saving in coal.

We have about 300 school buildings, including rented buildings to relieve overcrowded districts, in which are used nearly every conceivable style of heating and ventilating apparatus. There are 150 buildings heated by steam, and 75 of these are equipped with a heating and ventilating apparatus similar to that introduced five years ago and which has been fully described above.

It may be of interest to know the cost of a steam heating and mechanical ventilating apparatus since new methods have been adopted, as compared with the old style of five years ago, for a building containing 17 class rooms, 1 office and 2 recitation rooms.

	1889.	1894.
Steam heating.....	$7,595	$3,883
Mechanical ventilating.....	6,106	3,400

Which shows a saving in cost for both apparatus of about 46 per cent. in favor of the present system.



The Mason Receiver.

The Mason Receiver.

The Mason Regulator Company of Boston, Mass., have put on the market in connection with their steam pump a receiver for draining the condensation from radiators, drying cylinders, steam coils and, in fact, any system of steam heating. This receiver takes these returns and automatically delivers them to the Mason boiler feed pump. It will be noticed by referring to the cut that the condensation enters the receiver at the point marked "inlet" and fills the vessel until it carries the ball float up to a certain level, when the float in rising opens the balanced valve which is shown on the outside of the receiver and which admits the steam to the pump. The pump immediately starts and draws the accumulated condensation through the suction pipe, forcing it back into the boiler. The greater the quantity of water in the receiver, the faster will the pump move, and as the water level diminishes in the receiver the pump slows down. Instead of the ordinary copper float, an electro deposited float is used. Although the pump is single acting, it is impossible for it to stop on the center.

After the Convention.

THE presidential address of E. P. Bates at the opening of the Convention of the American Society of Heating and Ventilating Engineers can be read frequently by members and those desiring to become members with advantage, if its suggestions are followed. It is lofty in sentiment and the society will operate on a high plane if it is kept in mind by the members.

***

IN reading our report we find that the word "fsn" has been substituted for "coil" in the remarks made by Stewart A. Jellett on the use of heating coils behind the fan so that the fan drew its air supply through the coils.

***

THE opinions of the convention that have been expressed since its adjournment are unanimous in agreement that the society has made an excellent start and has been of value to all who were fortunate enough to be able to arrange their business to be present.

***

SOME of the less technical members hope to have their practice explained from a theoretical standpoint, so that practice and theory may not herd by themselves in the society.

***

THE society can do a great good to the public by treating furnace heating scientifically and in detail, so that its evils may be eradicated, as furnace heating is established to stay and is popular with an immense proportion of the public. Anything that is so generally used is worthy of attention.

***

IN the comparison of methods followed in heating the high buildings now common, some of the members did not agree, and in the discussion that ensued much food for reflection was furnished.

HEATING NOTES.

PRESIDENT JOSEPH BOND of the American Radiator Company, Chicago, sails for Europe on the 15th of February to arrange for the company's London office, of which Henry S. Downe will be manager. The present address of the company in London is care of the Union Bank.

IT IS STATED that the radiator factory at Elwood, Ind., has passed into the hands of a company of local capitalists with a paid up capital stock of $50,000, to be increased shortly to double that sum. The officers of the new company are: President, T. L. DeHority; secretary and treasurer, F. M. Headley; directors, A. J. Hobbs, J. B. Hobbs, F. M. Headley, T. L DeHority and John Halloran.

IN NEW OFFICES at 141 Centre street, New York, Thomas W. Weathered's Sons have a welcome for the hot water heating tradesman or those interested in greenhouse construction. On entering the outer office the drafting room is at one side and the general office at the other. From the general office entrance is gained to the private office and the wareroom. These offices are heated by steam, which presents the exhibition of their hot water boiler on the office floor heating radiators at desirable points, which was the method of heating employed in their former offices.

THE FOSTER ENGINEERING COMPANY, Newark, N. J., have just entered an order for two valves, 18-inch and 14-inch in size, intended for the Anheuser-Busch Brewing Association of St. Louis. These pressure regulators are of the Foster New "Class W" style, and when completed will be the largest reducing valves ever turned out of their works.

ROHN & ELLICOTT, Easton, Pa., are distributing circulars directing attention to the Easton boiler for steam or hot water. The fire box of this boiler is a hollow cast iron water reservoir, and the boiler proper is made of horizontal tubes presenting a very extensive surface to the heat. The circular gives table of prices and sizes and prints a number of references and testimonials.

PRESIDENT W. K. PIERCE of the American Boiler Company. Chicago, was a visitor at the New York house this week. The company have a varied line of steam and hot water heaters which they keep before the trade with satisfactory results.

GEORGE B. COBB & Co., 96 Centre street, New York, are enlarging their office and showrooms to facilitate the transsction of their business in steam and hot water heating. They are also showing some novelties in the gas heating line.

THE HEATING AND VENTILATING APPARATUS at the Ira Allen School House, at Burlington, Vt., was tested by E. O. Burrows, heating engineer of the Smith & Anthony Company, Boston, Mass., manufacturers of the heating apparatus, and George H. Holden of the G. S. Blodgett Company, who installed the plant, before the following School Committee: H. O. Wheeler, Charles E. Allen, Dr. D. C. Hawley, C. C. Miller, James Childs and others. The first test was made on the second floor. The supply of fresh air of inlet was 2257 cubic feet per minute. This gives for the 39 seats in the room 57 cubic feet of pure air per seat per minute. The quantity of air exhausted wss 2604 cubic feet per minute, which gives for esch of the 39 seats 66 cubic feet per minute. The carbonic test in this room showed four and sixtenth parts of gas in each 10,000. (As the outside air is considered pure at four this will be observed as a very gratifying result.) The difference in temperature at four different points in the room on the ssme level was only 2° F.

Electric Fans for Heating Purposes.

R. J. Feather of the Edison Electric Illuminating Company of Piqua, Ohio, writes to the *Electrical Engineer* as follows concerning a new and ingenious use for the fan motor: "I would like to state a use for the ordinary fan motor which is generally used for cooling a room. It may, I find, be employed to great advantage in a cold snap by placing one of them before the steam radiators in universal service and thus forcing the air between the coils of the radiator. Evidently this arrangement will greatly increase the heat yielding capacity of the radiator by diffusing the heat more rapidly and steadily, and instead of the heat being greatest close to the radiator, a circulation of air is set up which spreads the heat to every part of the room equally. This idea may help other readers of your journal to maintain the temperature of their rooms sufficiently high and even if they have fan motors."

Iowa Steam Fitters.

The Iowa Steam Fitters met at the Citizens' Association Rooms, Burlington, Iowa, lsst week, and perfected a State organization. Following were the members present:

Henry Dunker, Davenport; N. O. Holman, Mason City; John Burnside, Des Moines; John E. Allen, Des Moines; H. P. Keyhoe, Ottumwa; P. R. Sutton and Frank Volles, Keokuk; A. R. Barnacle, Boone; Chas. G. Bosch, Burlington; Wallace & McNamara, Des Moines; Des Moines Plumbing Company; W. H. Young & Son, Fairfield; George Kendall & Co., Clinton; John Coles, Des Moines; Henry Ewinger, Burlington, and the Davenport local. After transacting the routine business the following officers were elected:

John Collis, president.
Robert Clayton, vice president.
C. W. Rosene, secretary.
P. M. McNamara, treasurer.

The meeting then adjourned, subject to the call of the Executive Committee.

THE J. H. MCLAIN COMPANY, manufacturers of hot water and steam heaters and warm air furnaces, have removed their Chicago branch to 58 Dearborn street. In their new location they will have very pleasant quarters, with ample room for the display of samples as well as plenty of space for offices. They will be on the ground floor, so as to be easy of access, and are within the locality now distinctively recognized as the center of the steam, hot water and furnsce fraternity. The company do no contracting, but operate an entirely independent business, selling to the general trade. C. B. Matteson is the efficient manager in charge.

Good Advice.

The following excellent suggestion is sent us by a correspondent who signs himself "A. L. B." The moral of the story is so plain that no introduction is needed to emphasize it:

Bob-it-ty-bob go the runners
That carry tne hotel 'bus
With a load of guileless drummers
Who have put in the day with us.

We were not ready to buy,
But they were ready to sell,
And I sometimes wish when a drummer I see
That they were all in—well.

I don't mean the jolly drummers,
But the people who scnd them out,
For I certainly think
That printer's ink
Would bring the same tradc about.

A test last week of the chains made at the Charlestown Navy Yard, Boston, showed remarkable results. Five sections of 2¼ inch chain, 46 pounds to the link, were strained up to 380,000 pounds, when the officials desisted for fear of breaking the testing machine. The test was much in excess of Government requirements.

ROOFING AND CORNICE.

Conductor Heads.—II.

BY CORNICE WORKER.

Patterns for a Square Molded Leader Head.

In Figs. 16, 17 and 18 are shown the plans, elevations and patterns required for a square molded leader head, the leader to be square in plan and to stand away from the wall as indicated by A in the plan views. Let B C D E in Fig. 16 represent the plan of the leader head, corresponding to J K L M of the elevation, and F G H I the plan of the square pipe, corresponding to O of the corresponding numbers dropped from the profiles J L and K M at right angles to J K. Lines traced through these intersections, as shown by N P and O R, will be the desired pattern for the front of head. In Fig. 17 is shown the plan, elevation and pattern for the side of the leader head. C B D E represents the plan of the head, corresponding to J K L M of the elevation, and G F H I shows the plan of the square leader, corresponding to O of the elevation. As before explained the leader stands away from the wall, as is indicated by A in plan and side elevation, Fig. 17. It will be noticed that the profiles are profiles J L and M K. Lines traced through these points of intersection, as shown by N P and O R, will be the required pattern for the sides of the leader head, of which two would be needed, one formed right and the other formed left. The lines numbered 1′, 2′, 3′, 4′, 5′ and 6′ shown outside of the pattern in Fig. 17 correspond to the same numbers shown in the profile of the side elevation facing the wall line. Laps are allowed on the pattern of the side pieces, thus avoiding them on the front and rear pieces. In Fig. 18 is shown the plan, elevation and pattern for the rear of the leader

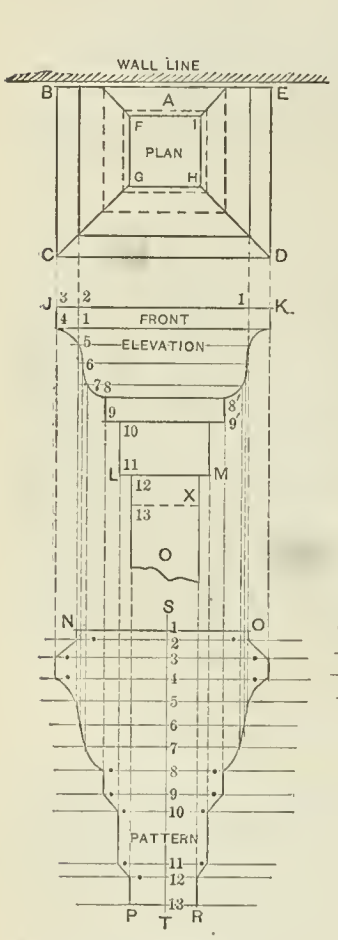


Fig. 16.—Plan, Elevation and Pattern for Front of Leader Head.

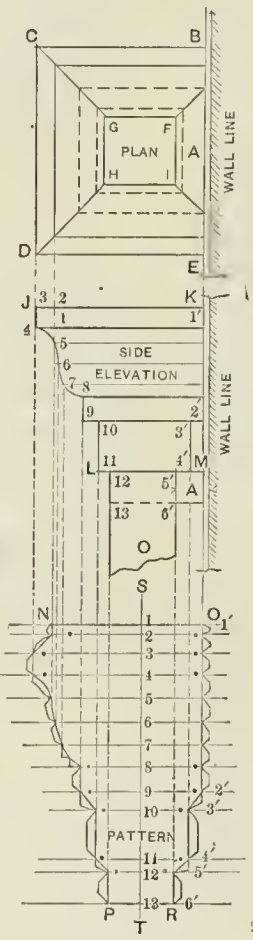


Fig. 17.—Plan, Elevation and Pattern with Lap for Side of Leader Head.

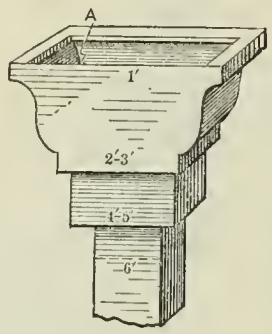


Fig. 19.—General View of Leader Head Indicated in Fig. 16.

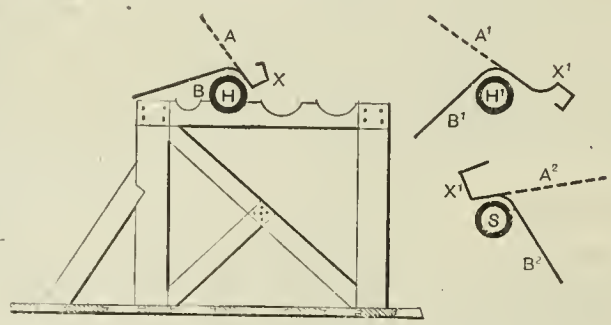


Fig. 20.—Method of Forming the Ogee and Cove on the Former.

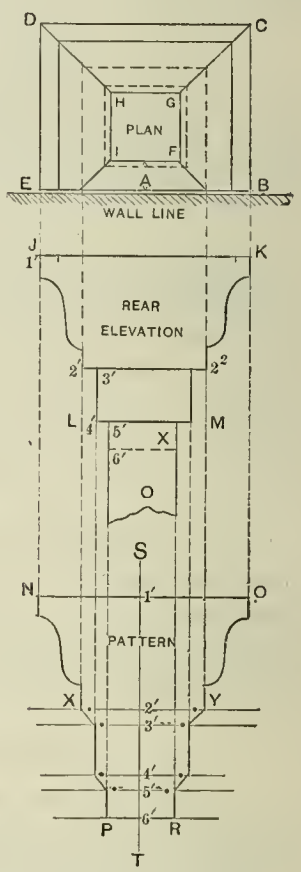


Fig. 18.—Plan, Elevation and Pattern for Rear of Leader Head.

CONDUCTOR HEADS.—DIAGRAMS ILLUSTRATING PATTERNS AND METHOD OF BENDING.

elevation. The dotted lines drawn from the elevation to the plan show their relationship to each other. The dotted line 13 X, drawn across the leader O of the elevation, indicates the flange which will be added to the pattern, the length of which is shown from 12 to 13 in elevation. For the pattern of the front proceed as follows: Divide the curved portions of the profile J L of the front elevation, Fig. 16, into an equal number of parts, as shown by the small figures. At right angles to L M of the front elevation draw the line S T, upon which place the stretchout of the profile J L, as shown by the small figures on the line S T. At right angles to S T and through the small figures draw lines indefinitely as shown, which intersect with lines of alike in the three elevations shown in Figs. 16, 17 and 18, and that part of the same profile is shown on the side elevation, as indicated by 2′, 3′, 4′ and 5′ in Fig. 17, which fills out the projection from the wall. For the pattern of the side proceed as follows: Divide the curved portions of the profile J L into an equal number of parts, as shown by the small figures. At right angles to J K of the side elevation draw the line S T, upon which place the stretchout of the profiles J L in the side elevation, as shown by the small figures on the line S F. At right angles to S T and through the small figures draw lines indefinitely, as shown, which intersect with lines of corresponding numbers drawn at right angles to J K of the side elevation, from the small figures in the head. D E B C indicates the plan, corresponding to J L M K of the elevation, and H I F G shows the plan view of leader, corresponding to O of the elevation. With the usual projection A, it will be noticed that J 2′ 2² K, of the rear elevation in Fig. 18 is simply a flat piece of the same shape as shown in front elevation in Fig. 16 by J 9 9′ K, the side view of which is shown by 1′ 2′ in the side elevation of Fig. 17. The dotted lines drawn from the side elevation to the rear elevation show the relationship of parts indicated by similar numbers. Number the bends shown in the rear elevation, 1′, 2′, 3′, 4′, 5′ and 6′, corresponding to the figures shown from K to M of the side elevation, Fig. 17.

For the pattern of the rear of head

proceed as follows: At right angles to J K of the rear elevation, Fig. 18, draw the line S T, upon which place the stretchout of the profile K M of the side elevation, Fig. 17, as shown by the small figures on the line S T in Fig. 18. At right angles to S T and through the small figures draw lines indefinitely, as shown, which intersect with lines of corresponding numbers drawn from the numbered heads at right angles to J K of the rear elevation. A line traced through these intersections, as shown by X P R Y, will be part of the rear pattern. For the remainder proceed as follows: The remaining portion above is a duplicate of J 2′ 2^2 K of the rear elevation. In Fig. 19 is shown the finished view of the leader head, as seen from the rear. The bends marked 1′, 2′ 3′ and 4′ 5′, Fig. 19, indicate bends of similar numbers shown in the rear elevation. At A of Fig. 19 are shown some of the laps indicated on the pattern of the side shown in Fig. 17.

Forming or Bending the Head.

Fig. 20 represents an end view of the former and indicates the method of forming the ogee moldings. Select the proper size pipe or former and place it in its cross groove. Let J L in Fig. 16 represent the molded head to be formed The bends 2, 3 and 4 in the profile J L are bent upon the hatchet stake as explained in the previous article and then placed upon the former H in Fig. 20 in the position shown by X A. Hold X firmly against the former and press down A, and it will look as shown by X B. Now place X B upon the former H^1 in its proper position as shown by X^1 A^1. Hold X^1 firmly against the former and press down A^1 and it will look as shown by X^1 B^1, which completes the ogee. The square bends shown by 8, 9, 10, 11 and 12 in the profile J L, Fig. 16, are made upon the hatchet stake.

FLASHINGS.

Auld & Conger have recently made some improvements at their slate quarries, among which may be mentioned the extending by 170 feet of their storehouses at Raceville, N. Y. This makes the entire storage shed about 400 x 40 feet and gives a capacity of about 10,000 squares. This shed is at the railroad terminal of their tramway and connects with their Mammoth Vein Green Quarry. The quarries of the concern are located about 3¾ miles from the village of Poultney, and prior to the building of their tramway all slate had to be hauled that distance by team, which was unsatisfactory for a number of reasons, prominent among which were the frequent and serious delays in shipping. The result was a cable tramway 1¾ miles in length, which has a capacity of eight cars per day. This tramway is an endless rope, supported on trestles about 300 feet apart and from 15 to 55 feet high, depending upon the surface of the ground over which it passes. On this rope are wrought iron baskets of sufficient size to carry about one third of a square of slate. The baskets are suspended by an arm or bail, with a saddle resting on the rope in such a way that the baskets remain stationary, while the rope is kept in motion by an engine at the quarry end of the line. The firm are large producers of roofing slate, and have quarries and offices at Poultney, Vt., and Bangor, Pa. Their principal office, however, is located at 100 Euclid avenue, Cleveland, Ohio.

C. B. Rickert, 149 Clark street, Chicago, has the contract for the skylights and sheet metal work on the Fort Dearborn Building, Clark and Monroe streets.

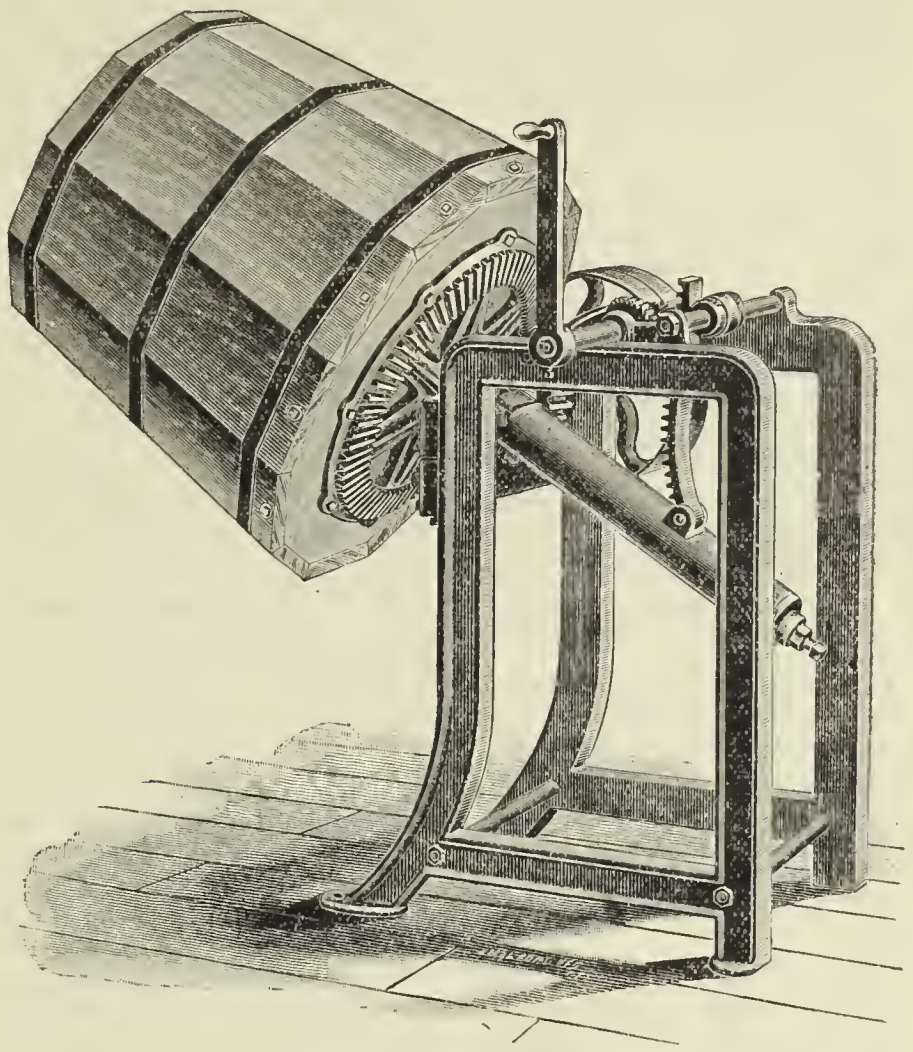
Wagner Bros., 1350 Diversey street, Chicago, have the contract for the galvanized iron cornice, skylights and slate roofing for the soda water factory of M. Hoffmann, Noble and Blucher streets.

James J. White, 185 Dearborn street, Chicago, is to furnish about 200 squares of corrugated iron sidings, gutters and conductors for the Gates Iron Works, Elston avenue and Bloomingdale road.

Kurtz & Co., 2427-29 Calumet avenue, Chicago, are furnishing the copper cornices for the residence of T. Leonard, Grand boulevard and Forty-eighth street.

Williams & Manogue of Grand street, Troy, N. Y., have their full force of men now on the State armories jobs, both at Niagara Falls and at Glens Falls, N. Y. They are doing the slate and metal work on both armories.

The Clason Company of No. 3 Charles street, Providence, R. I., have just received the contract from Messrs. Norcross Brothers for the slate and copper work on the Francis S. Kinney new mansion at Narragansett Pier, R. I.



The Baird Tilting Tumbling Barrel.

J. J. Colvin, 159 La Salle street, Chicago, is doing the galvanized iron, tin and copper work on the two residences of J. L. Cochran, Edgewater.

Fred. Hartmann, 143 Wells street, is furnishing a large amount of galvanized iron work to be used in connection with refrigerating machines.

G. Drouve, Bridgeport, Conn., has several thousand dollars' worth of copper in his shop on Clinton street, part of which is being made up into skylights for the roof of the big new building of the Farrel Foundry & Machine Company in Ansonia.

C. B. Rickert, 194 Clark street, Chicago, is to furnish the copper work and tile roofing for the residence of Mrs. Emmons Blaine, Rush and Erie streets.

The Knisely & Yeldham Company, 68-74 West Monroe street, Chicago, have the contract for copper work and Spanish tile roofing on the residence of William Metzger, Washington boulevard and Sacramento avenue. The copper to be used is 18-ounce both cold rolled and soft. Some five tons will be required. They have also just finished a large copper cornice for Contractor Bishop on the new Boston store.

The Baird Tilting Tumbling Barrel.

The tilting tumbling barrel made by the Baird Machine Company of Oakville, Conn., is formed with a spindle projecting from the bottom, as shown in the illustration. This spindle enters a sleeve pivoted to swing at its upper end and having a segmental rack attached near its lower end. This rack engages with a pinion mounted on a crank shaft, by means of which the barrel may be given any desired inclination. It is held in position by a ratchet and pawl. The barrel is driven through bevel gearing, as shown. These barrels are made of wood, steel or brass, the ordinary size being 29 inches dismeter at the bottom, 24 inches at the top and 26 inches deep inside.

PLUMBING and GAS FITTING.

Pennsylvania Plumbing Law.

A bill introduced to the Legislature at Harrisburg, Pa., to establish a Bureau of Plumbing and House Drainage in all cities of the State has already passed the first reading in the House. The bill places the bureau under the supervision of the Department of Public Safety, and makes it the duty of the director of the department to appoint one or more suitable persons as inspectors for the bureau, the compensation of such inspectors to be fixed by the councils of the city in which the bureau has been established.

The inspectors are to pass upon applications of persons who desire to engage in or continue the business of plumbing, gas fitting and house drainage, and if they find the applicant competent, to report to the Director of Public Safety, who shall issue a certificate to the applicants, permitting them to conduct the plumbing business.

The inspectors are also required to examine all buildings in the city to determine their condition as to the plumbing, gas fitting, drainage and ventilation, and when the work is found defective they shall have power to order the removal, substitution or repair of the condemned material or work if it is not done by the owners within 15 days after notification.

Any person refusing to admit the inspectors upon his premises for the purpose of examining the plumbing or drainage shall be deemed guilty of a misdemeanor, and, upon conviction, for each offense shall be subject to a fine not exceeding $100, and in default of the payment of the fine shall be liable to imprisonment not exceeding 30 days.

House Drainage Inspection.

Chief Inspector of House Drainage George P. Hughes of Philadelphia has made his annual report. It shows that plans for 4787 new and 17,414 old buildings were approved. The total number of inspection visits made during the year was 50,313, and there were referred from the nuisance division of the bureau to the house drainage division complaints involving 662 buildings, of which 619 were inspected and reported to the Board of Health with a recommendation for their abatement.

"The business of this division during the year," the report reads, "exceeded that of any other year since its organization. The greatest amount prior to this was in 1893, when 17,231 plans were approved, while this year the number was 22,201, an increase of 4970 over 1893. This was direct revenue to the city through the division of $22,201. The large increase in business, owing to the demand, was the cause of shipments to this market of large quantities of inferior material, principally iron pipe fittings, which were promptly condemned and removed from the work. In order to detect the character of material the inspectors were each furnished with a pair of registering calipers by which the thickness of the pipe or fittings might be determined. As a consequence of the close inspection of the material, the inferior kind is now rarely found on the work.

"The work constructed extended over the entire city and county, and as the inspectors' time is entirely occupied in responding to applications for the inspection of work under construction, opportunities were offered, and in many instances embraced by a certain class of plumbers, to violate the rules of the board. After a short time, however, these violations were discovered and, with the co-operation of the owners, they were corrected and the work made to conform to the rules at an expense of hundreds of dollars to the violators, which has had a salutary effect."

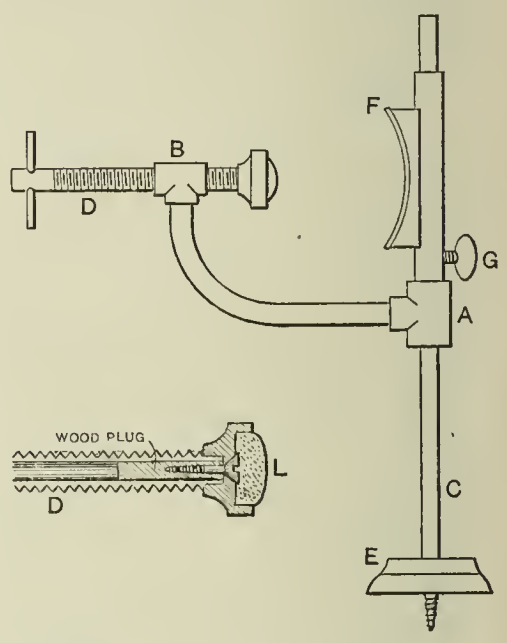
A Handy Pipe Holder.

BY OLIVER TWIST.

This is a tool that every plumber will appreciate, and one which every one may make for himself with very little trouble and expense. They are intended to take the place of a half dozen bricks or so, which have been used from "away back" by plumbers to hold by their weight two or more pieces of pipe from moving while the joint was being wiped. The bricks often had a fashion of taking a slide just when they should have been immovable, and consequently were responsible for considereble "cussin'." Referring to the illustration, A is a tee $\frac{3}{8}$ x $\frac{1}{4}$ inch. B is a tee $\frac{1}{4}$ inch. Take a piece of $\frac{1}{4}$ inch pipe and bend it as shown to connect these two tees. Leave about $3\frac{1}{2}$ inches between B and F, so that when finished they will allow a 2-inch pipe to pass through easily. Cut a $\frac{3}{8}$-inch nipple about 4 inches long with a thread on one end only, and screw into A. Take a piece of sheet brass or lead 1 inch wide and $2\frac{1}{2}$ inches long, cut into an oval shape and curve a little and solder it to the $\frac{3}{8}$-inch nipple, as at F. To make a thumb screw as shown at G, drill a hole $\frac{1}{4}$ inch in diameter and tap it to fit a $\frac{1}{4}$-inch stove bolt and solder on a small piece of sheet brass to give a hold for the fingers to turn it.

This allows the vise to slide up and down the standard C to suit the work. C is a piece of brass, or iron pipe, that will pass through the $\frac{3}{8}$ inch nipple freely and is 10 inches long, being tapped into a flange to form a base. Now take $1\frac{1}{2}$ inch screw nail, cut off the head and solder the remainder into the end of the pipe C, where it comes through the flange E, as shown. D is a piece of pipe 5 inches long, having a $\frac{3}{16}$-inch hole drilled through it, $\frac{1}{2}$ inch from one end, through which is put a piece of wire 2 inches long and the end of the pipe filled with solder. It is threaded up 4 inches, so as to screw easily through the tee B. At the left of the sketch is an enlarged view showing how to fix the cap on the end, the cap being nothing more than the stuffing box of an old basin cock. To fix it to the nipple D, file off the thread for $\frac{1}{2}$ inch back from the end and drive in a wooden plug. Then, by means of a screw and washer, the cap may be fastened to the nipple so that it turns freely. A thick leather washer is then placed in the recess, as at L, thus preventing the lead pipe from being bruised.

Three of these holders form a set, so that branch joints may be wiped. When in use the standard C is screwed into 1-inch board or the work bench, and the remainder slipped down over this and fastened by the thumb screw G, at any hight. To wipe an upright



A Handy Pipe Holder.—General View with Enlarged Sectional View of Clamp.

joint screw them into the wall. With a little practice they will be found adaptable to all requirements.

TRAPS AND VENTS.

BOWEN & BEACH, Medina, N. Y., are sending circulars to the plumbers of their improved vent cap, which fits light or heavy soil pipe and is attached without calking or screws.

THE PLUMBER will find a very handsome new bathtub supply and waste on exhibition in the showroom of the Henry Huber Company, 81 Beekman street, New York. The fixture is quite elaborate and is placed entirely outside of the tub, resting on a tripod, with an ornamented curved supply to discharge the water into the tub. It is very attractive and one of the very latest bath fixtures.

THE MASTER PLUMBERS' ASSOCIATION of Philadelphia has sent to the Legislature at Harrisburg, Pa., a petition asking that the plumbing law now before that body be changed so that it will in no way affect the act of 1885, which is satisfactory alike to plumbers, builders and the public. Secretary Harkness and several members of the Philadelphia Master Plumbers' Association have spoken before the legislative committee in support of their petition.

MCINERNY & HICKEY have been granted a plumbing license at Minneapolis, Minn.

EDWARD F. GOULD, the New York representative of the Pittsburgh Brass Company, Pittsburgh, Pa., is showing

the plumbing trade a handsomely nickel plated comb and brush bracket as one of their many bathroom specialties.

A BILL has has been introduced in the Michigan Legislature to regulate and control plumbers and plumbing in that State.

WM. M. OCKERMAN has begun business at Greenville, Ohio, and will do all kinds of tin, copper and sheet iron work, plumbing and pump fitting.

FRANK PARKE, Twenty-third avenue and Eighth street, Meridian, Miss., is an ambitious young mechanic whose enterprise ought to insure him the success he is seeking. He is but 16 years old and has already launched out for himself in sheet metal work, and is prepared to do small, simple jobs of plumbing. He issues a circular addressed to the public under date of January 15, in which he asks that they give him a trial.

J. W. COMMERFORD, Joplin, Mo., has bought out the business of J. D. Kane snd likewise taken the business of the Joplin Water Works Company, he having been connected with the latter concern for some years as foreman of the plumbing department.

OF THE 52 master plumbers in the city of Rochester, N. Y., says a local paper, but two have complied with the statute which requires that they renew their licenses the first of the year. Those who have violated the law are liable to prosecution by the Health Department. It is required by law that every master plumber in Rochester shall first pass an examination before the Board of Plumbing Inspectors and then secure a license from the Executive Board, after which a certificate must be secured from the office of the Board of Health. The certificates are renewed without cost.

J. H. & W. H. RILEY succeed Shumway & Riley in the plumbing business at Northampton, Mass.

J. DILLON, Doylestown, Pa., is using a new cellar drainer in the houses of some of his customers.

THE IOWA STATE MASTER PLUMBERS' ASSOCIATION met last week in annual session at Burlington, Iowa, with about 30 delegates from various cities of the State. The meeting was called to order by President J. A. Harris of Des Moines. The Mayor of the city made an address of welcome, and other addresses were made by President Harris and President H. D. Crane of the National Association of Master Steam and Hot Water Fitters of the United States, and Mr. Aherns, State president of the same association. The second day of the meeting was consumed with routine work, the chief of which was the election of officers. Those selected are : President, Henry Ewinger, Burlington; vice-president, Robert Clayton, Davenport; secretary, John E. Allen, Des Moines; treasurer, P. J. Barry, Muscatine. The delegates were entertained by the local plumbers with a banquet.

BARRETT & WALLACE, Cohoes, N. Y., tinners, plumbers and jobbers, have moved their place of business to 220 Remsen street.

DETROIT is considering the erection of a $60,000 public lavatory on the Campus Martins, which will be an imposing structure, heated by steam.

KING & HYLAND COMPANY have been incorporated at Chicago, with a capital stock of $10,000, to manufacture plumbing and gas fitting apparatus. The incorporators are John A. King, Michael S. Hyland and Robert J. Bieg.

JOHN D. ELLIOTT, George F. Tobey and William Deacon have made application for civil service examination as inspectors of plumbing at New Bedford, Mass.

WILL ADAMS of Dryden, N. Y., and Fred. Bauchle of Owego have formed a copartnership and rented the Bouton shop next the town hall on South street, Dryden, N. Y., where they will carry on a general business as practical plumbers, tinners, and general jobbers in hot water, hot air and steam heating apparatus.

HOWARD W. GEIST and Daniel K. March have associated themselves in the plumbing, tinning and stove business at 453 High street, Pottsville, Pa.

W. G. WATERS has recently opened a plumbing establishment at 114 Grand avenue, New Haven, Conn., and already has the plumbing contracts on a number of houses in that section. He will handle the Page steam heaters and will make a specialty of oil and gas heaters.

ROCKVILLE, CONN., has taken steps to secure a system of sewers, so it is reported by the New Haven *Record*.

J. E. JACKSON of the firm of Jackson & Longton, Rhinelander, Wis., was elected sergeant-at-arms of the Wisconsin State Association of Master Plumbers. A wrong address for his firm was accidentally given in our report of the recent convention.

THE TORONTO STEEL CLAD BATH & METAL COMPANY, LIMITED, and the Booth Copper Company of Toronto send out conjointly a serviceable reminder of their concerns in the shape of a calendar desk pad, on each sheet of which are places for four memoranda, the spaces carrying the day of the month, week and year. There is also reference to the Resisto copper boilers and the Steel Clad baths.

THE COPARTNERSHIP existing under the name of F. D. Dumond & Son, plumbers, 25 South Clinton street, Rochester, N. Y., has been dissolved by mutual consent, the business to be continued by A. A. Dumond at the same address.

THE selling of a mixture of common metals for a high grade aluminum alloy was recently brought to light, and illustrates the means that are taken by unscrupulous persons to get a little money at the expense of the reputation of this new metal. Aluminum has had widely extending uses during the past year or so, since its price has been brought within reasonable limits, and has been largely employed in the manufacture of kitchen utensils and certain sanitary articles. We hope that there will be no other cases of imposture, and that goods sold as all or in part aluminum may not be cheap alloys that will soon tarnish and be unsatisfactory for the purposes to which they are put.

IMPORTANT REDUCTIONS have been made in the prices of Mott's Imperial porcelain, Colonial and Yorkshire ware. By reason of largely increased means of production, the J. L. Mott Iron Works of New York and Chicago are enabled to announce substantial reductions in the prices of their Imperial porcelain, Colonial and Yorkshire ware, bathtubs, sitz baths, sinks, wash trays, &c. These articles are the perfection of cleanliness and durability, being molded in one solid piece of glazed porcelain about 1½ inches thick. Circulars announcing the reductions are being mailed.

CAPT. ANSON WITHEY has formed a partnership with J. E. Hubbard in the plumbing business at Greenfield, Mass.

HARRY A. BLACK PLUMBING COMPANY, Chicago, have been incorporated with a capital stock of $5000. The incorporators are W. D. Anderson, Conrad Kohler and Charles Daft.

A VERDICT has just been rendered in the New York courts which ought to help along the cause of tenement house reform. The plaintiff in the case hired a tenement of the defendent which proved to be in bad sanitary condition, in consequence of which condition the plaintiff lost two of his children. He brought suit for damages against the landlord and recovered $2000.

PLUMBERS' LICENSES have been granted to John J. Keilt, John P. Langew and James J. Gorden to make connections with the water mains of Jersey City, N. J., also to do general plumbing work.

THE COLWELL LEAD COMPANY, 63 Centre street, New York, have secured a building on Worth street which they will use for the storage of sanitary goods and earthenware. This building is connected with their offices and salesroom on Centre street by a bridge. They now have a frontage on three streets, the entrance to their sheet lead and lead pipe mill being on Pearl street.

ONE OF THE NEWEST BATHTUBS on the market is made by R M. Wilson, Rome, N. Y., and is on exhibition at the New York salesroom, 92 Walker street. The tub is made of sheet copper of ample strength to support the weight of a bather. It is heavily tinned on the inside, and on the outside the copper is cleaned and presents its natural color, being protected from the atmosphere by a coat of durable varnish. It is supported on bronzed cast iron legs of ornamental design and has a wood rim. It is provided with a waste and overflow and arranged for standard bath cocks.

SOME NEW THINGS in bathtub decoration are shown in the sample rooms of the J. L. Mott Iron Works, Beekman and Cliff streets, New York. The ornamentation is of the relief character, artistic in design, with the effect made brilliant by the highest points being touched with gold.

A BILL has been introduced in the New Jersey Legislature to reduce the price of gas to $1 per thousand. A contractor before the committee stated that gas could be profitably made at less than 50 cents. Representatives of the gas companies asked that the report of the committee be delayed one week to enable them to speak fully on the measure.

JOLIET SUPPLY COMPANY have been incorporated, at Joliet, Ill., with a capital stock of $20.000, to deal in plumbers' supplies. The incorporators are William Douglas, Joseph E. Ralph and Charles W. Munn.

THE BOARD OF HEALTH of Waco, Texas, has been petitioned to take action to secure a plumbing inspector for the city, and a committee has been appointed to investigate and report on the subject.

Standing Committees of New York Plumbers.

The various committees of the Association of Master Plumbers of New York for 1895 are as follows :

PROTECTION.

Wm. McDermott.
J. S. Lindsay.
A. H. Brown.
Samuel Malcolm.
John Spence.

CONFERENCE.

J. Gillroy.
H. J. Pattison.
T. J. Cummins.
J. W. O'Brien.
Alexander Bryant.

TRADE SCHOOL.

Edward Murphy.
Col. George D. Scott.
James Muir.
Frank Reynolds.
Thomas J. Tuomey.

AUDITING.

Frank Reynolds.
Edward Murphy.
John E. Toumey.

LEGISLATION.

Wm. Montgomery.
Alexander Bryant.
Thomas J. Tuomey.
Thomas F. Gaynor.
M. J. McDermott.

LAW.

Colin Campbell.
J. Whelan.
Milton Schnaier.
Wm. R. Hill.
Chas. H. Kranichfelt.

DEPARTMENT.

John Yule.
J. McEntee.
Paul Euell.

New Publications.

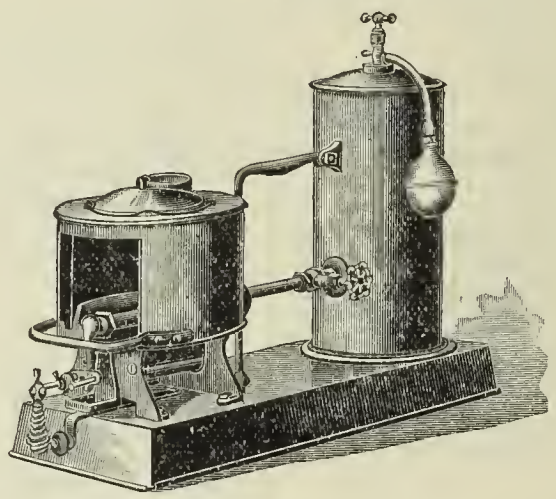
HAND BOOK OF PRACTICAL MECHANICS. By Charles H. Saunders, Ph.B., Yale. Size 4 x 6 inches; 116 pages; published by the Student Publishing Company, Hartford, Conn., 1895. Price $1.

Mechanics and those interested in the building and running of machines will derive much assistance from this little volume, which contains in compact form a large amount of useful information. Great care has been taken in the work to simplify the calculations so far as possible, and in addition to what is of particular reference to machine shop work, there are other rules and formulas of wider interest. The book, for instance, begins with rules for calculating the bursting pressures of cylinders and pipes. The full title as given on the first page indicates the scope of the work. It describes a hand book of practical mechanics for use in the shop and drafting room, containing tables, rules and formulas and solutions of practical problems by simple and quick methods. Logarithms, sine, cosine and tangent tables, areas and circumferences, decimal equivalents of an inch, a foot and a pound; bevel and spur gears, worm and worm gears, United States standard bolts and nuts, tapping drills, lathe thread cutting, cams, &c.

The tide of emigration still sets eastward, the number of steerage passengers leaving New York by the transatlantic lines this month having been larger than the arrivals. This has been the case for several months, leaving the balance of trade in immigrants, so to speak, against the United States.

Canners' and Tinners' Furnace.

The Burgess Soldering Furnace Company, Columbus, Ohio, are placing on the market a new combination furnace, Gem No. 8, which is shown in the accompanying illustration. It is especially adapted for canning factories and for heavy work. The opening in hood of furnace will accommodate two 3-inch capping irons, and by removing the top cover will also accommodate the one or more tinners' soldering coppers that are used in connection with capping irons. The plate on which the coppers rest is made of cast iron deflected with projections which form flues for conducting heat under same. The sides are also equipped with flue plates which protect the bolts and conduct heat from front to rear of hood. The slotted burner is cylindrical and made of heavy cast iron, the shape being such that solder cannot fall into the perforations.



Canners' and Tinners' Furnace.

The heat is distributed the full length of the irons, and the burner being recessed in front and back insures durability. It is also furnished with a sliding drip cup, the knob of which is always cool. The plate on which the coppers rest is but a few inches from the workman's bench, an advantage to which special attention is directed. The reservoir shown is pneumatic and fireproof, which cannot be filled while the burner is lighted, thus avoiding accidents. It is made of IXXXX tinned steel or copper, and holds 2 gallons of gasoline, sufficient to last several days. The patent rubber bulb used on this furnace is made of heavy black rubber, the valves of which are located between bulb and tube. The air, oil and regulating valves are all furnished with stuffing nuts. The regulating valve is supplied with an Alaska handle, which always remains cool. The base on which the furnace and reservoir rest is made of refined steel. The manufacturers state that these furnaces are used by a number of the leading canning factories, and are giving the best of satisfaction. They also add that this furnace can be used by tinsmiths and roofers, and is guaranteed to work out of doors in all kinds of weather.

The system of street railway mail service has proved so successful in several cities that the Post Office Department intend adopting it in all the larger cities of the United States.

News and Notes.

The American Flint Glass Workers' Union is making arrangements to start plants of its own in different parts of the country on a co-operative basis.

The journal of the Statistical Society of Paris points out the fact that, notwithstanding the large bounties it enjoys, the shipping industry of France is showing a serious falling off. The tonnage of vessels sailing under the French flag decreased from 9,704,191 tons in 1891 to 8,382,311 tons in 1893. In 1894 the situation was no better, so far as could be judged from the returns for the first nine months of the year, which showed a decrease of 6 per cent. as compared with the same period of 1893.

In Chicago last week Judge Grosscup handed down a very important decision in the suit of the Thomson-Houston Company *vs.* the Western Electric Company, for infringement of their patent for an automatic regulator of dynamo electric machines. These regulators are used on all dynamo electric machines, and the Thomson-Houston Company had the right to sell the important device, the patent for which was valued at $2,000,000. In the opinion of the Court it was held that the Thomson-Houston patent is invalid, on the ground that it possesses no novelty in view of an earlier patent for a similar invention which "discloses a device almost identical with that of the patent in suit."

The cycle industry is referred to as being one of the most flourishing industries in France at the present time. According to statistics issued by the French Ministry of Commerce, the total trade in cycles, both import and export, last year, aggregated in value about $2,000,000.

A strong opposition exists in Philadelphia to the present plans for the new railway bridge over the Delaware River.

State Engineer Adams, in his annual report just submitted to the New York State Legislature, advocates the deepening of the Erie and Oswego Canals to 9 feet, and of the Champlain Canal to 7 feet, as well as the lengthening of the single locks on the canals. In treating of electricity as a motive power he asserts that greater speed and economy of towing can only be obtained by this medium.

The Brooklyn *Eagle* estimates the net weekly loss caused to the city of Brooklyn by the recent street railroad strike at rather over $1,000,000.

TIN PLATES.

A Tin Plate Suggestion.

The following, which has reached us from a correspondent firm in Vermont, contains a hint which it seems might be profitably taken by domestic tin plate manufacturers and dealers:

We would like to make a suggestion through *The Metal Worker* for the interest of the buyer of American tin plates, as well as for that of the manufacturer and seller of the same, and it is this: That the different houses that sell American tin plates send to their customers circulars or pamphlets of all the American tin plates they have to sell, with prices of same, welght, sizes, &c., and their relative merits as compared with the standard imported plates, such as the Melyn, Allaway, Steel Coke or B. V. grade, as quoted in *The Metal Worker*, for bright plates, and M. F., Pontymister, Worcester, Dean, Abercarne, &c., grades in roofing plates. We believe that most of the American tin plate buyers are still ignorant of the real merits of the American made plates; at least they are not nearly as well posted in regard to them as they are on the imported plates. I know that we plead ignorance in this respect, although we do not buy as many plates now as a few years ago, and wish for more light on the subject. We believe this will work for the benefit of Americans, both buyers and sellers.

A Correction.

Respecting an item that appeared in *The Metal Worker* last week, which purported to quote the opinions of John Jarrett, secretary and treasurer of the Tinned Plate Manufacturers' Association of the United States, as expressed in the New York *Herald*, of January 21, we have received the following letter from Mr. Jarrett, which we print below:

I was very much surprised in looking over *The Metal Worker* of this week to find in the Scrap column of the Tin Plate Department an item that I had written to the New York *Herald*, giving as my opinion that, with the slight reduction in wages agreed to by the tin plate works, the American mills can be operated with a fair percentage of profit.

Permit me to say that I have not written to the New York *Herald*, nor have I at any time expressed myself in the manner indicated. On the other hand all through the wages controversy between the tin plate manufacturers and the Amalgamated Association I have steadfastly maintained that the manufacturers should secure the full reduction they had demanded to permit them to operate their mills at a low percentage of profit. The compromised wages accepted by a few of the manufacturers lately is not satisfactory and in my opinion will not secure remunerative profits to the mills and another adjustment of wages will be necessary at a very early day.

SCRAP.

FORD & DONNELLY, Kokomo, Ind., have placed in the tinning house of the Atlanta Steel & Tin Plate Company, Atlanta, Ind., four machines for cleaning tin plates by drawing them through bran. It is claimed that these machines will not only greatly reduce the amount of hand labor required in cleaning the tinned plates, but will clean them much better, a point which will be appreciated by consumers of tin plates for canning purposes. Ford & Donnelly now equip complete tinning plants, with the exception of mills. A machine they are at present working on is a tin plate polisher of double the ordinary capacity, yet occupying very little more space, and, we understand, not greatly exceeding in cost the single capacity machine. Plates passed through this machine come out, it is said, like burnished silver in five seconds of time.

IN giving his workmen notice of his intention to close down the Morfa Tin Plate Works, Llanelly, Wales, at the end of January, John S. Tregoning, the proprietor, said that the concessions recently made by the tin plate workers in the Llanelly district were not sufficient to enable the manufacturers to meet for long the local competition in America. The boxes of tin plates now stored at the Morfa works, he said, were not salable at a shilling off the cost of manufacture and he did not see his way to go on making plates at a loss.

WORK on the National Tin Plate Works plant, North Anderson, Ind., is reported to be progressing rapidly. The main building was finished this week, and the machinery and engine rooms are completed and under cover.

A DISPATCH rom Elwood, Ind., to the Cincinnati *Jommercial Gazette* states that since last week Chicago and Cincinnati capitalists who are interested in the manufacture of tin plate have decided to locate a five-mill plant between Elwood and Franklin, on the Quick City land syndicate's property. They made the syndicate the proposition to erect the plant, which will employ 300 men, provided a subsidy of $22,000 be raised for them. This amount has almost been raised, and every detail of the deal will, it is expected, be closed up shortly. The com pany intend to have the plant in operstion by August.

THE KRING LUMBER & SAW MILL COMPANY, Atlanta, Ind., are erecting a plant for the manufacture of boxes from native hardwoods. Machinery of latest design is being put in, and boxes of all kinds will be made, but boxes for tin plate will be their specialty. They have already contracted with the Atlanta Steel & Tin Plate Compsny for several months' supply.

ELLWOOD TIN PLATE COMPANY, Ellwood City, Pa., for whom Samuel A Sague, 206 and 207 Western Reserve Building, Cleveland, Ohio, is general agent, issue a quotation sheet of their Bishop brand of tin and terne plates. These include four grades of charcoal bright and one of coke bright plates, as well as four varieties of guaranteed terne plates.

J. A. BRUNER, who had charge of the tin plate sales department of the St. Louis Stamping Company, St. Louis, Mo., severed his connection with that firm on February 1 to enter the fire insurance business. Mr. Bruner will be connected with Charles L. Crane & Co., St. Louis, and his many friends will wish him abundant success in his new field.

THE AMERICAN TIN PLATE COMPANY of Elwood, Ind., have put in operation the new four-mill addition to their rolling mill.

THE MONONGAHELA TIN PLATE COMPANY, Pittsburgh, of which Senator M. S. Quay is a large stockholder, signed the Amalgamated Association tin plate scale last week. Some of the mills of this concern are expected to be put in operation on Monday, February 4.

THE PLANT of the Vulcan Iron Company, Limited, New Castle, Pa., manufacturers of rolling mill and tin plate machinery, is in operation to full capacity. Among contracts now on hand by this firm may be mentioned a new design of pickling machine for the Britton Rolling Mill Company, Cleveland, Ohio; two trimming shears for the Montpelier Sheet & Tin Plate Company, Montpelier, Ind.; two patent rod reels for the New Haven Rolling Mill Company, New Haven, Conn.; all the cast iron work for 18 sheet mills, pair furnaces and an annealing carriage for the Monongahela Tin Plate Company of Pittsburgh, Pa.

THE ELLWOOD TIN PLATE COMPANY, Ellwood City, Pa., will accept the Amalgamated Association compromise scale, providing for a reduction of 15 per cent. on rolling and 12½ per cent. on heating and doubling on common gauges. This plant, however, will be operated on a non-union basis, and the Amalgamated Association scale will not be signed.

IMPORTANT INTERESTS having joined with the New Castle Tin Plate plant, at New Castle, Pa., the same will be very largely increased. It is reported that a large New York importing firm and a leading can manufacturer of Chicago have become interested.

THE PHILLIPS TIN PLATE COMPANY, Philadelphia, advise us that they have abandoned the word "Waldo" as a brand name for one of their grades of roofing plates, that name having been in the market for some years. It has been replaced by their new brand, "F. R. P. Extra," which is the best palm oil process roofing plate made by the firm.

THE ENTIRE PLANT of the Scottdale Iron & Steel Company, Limited, Scottdale, Pa., manufacturers of iron and steel sheets, is in full operation, and prospects for the future are very encouraging. The equipment of this plant is being increased by the addition of another cold rolling mill, which is ex-

pected to be in operation in about a month. This concern are experimenting with the use of coke for fuel in their heating furnaces, with a view to determining the relative cost of coal, which may be displaced if the experiment is satisfactory, so far as regular and sufficient heat is concerned.

THE AMERICAN TIN PLATE WORKS are rapidly falling again into the line of activity, some after signing the Amalgamated Association scale, and others, on a non-union basis, by local arrangement with their employees. At present about three-fourths of the total productive capacity of the domestic tin plate plants are running, and more works are on the point of starting up. The tin plate wage trouble is, in fact, practically at an end. The last idle firm of the Tinned Plate Manufacturers' Association, the Ætna Standard Iron & Steel Company of Bridgeport, Ohio, are reported to have signed the compromise scale of the Amalgamated Association a day or two ago, and their mills, which are among the largest in the country, will be again in operation in a few days.

A PRESS DISPATCH from Pittsburgh announces that another conference of tin plate workers and their employers will soon be held, with the view, through mutual concessions, of removing the obstacles which still prevent some of the manufacturers from coming to terms with their workmen and starting their idle mills.

SEVERAL MORE Welsh tin plate works have been closed down this week, including those of the Mansel Tin Plate Company, Port Talbot; Glanbeudy Tin Plate Company, Brynamman, and Llansamlet Tin Plate Company, Worcester, Swansea. The situation of the industry in South Wales is regarded as very unpromising.

RUMORS are prevalent of impending heavy failures in the Welsh tin plate trade. The financial position of two large works in South Wales, of which the names are not given, is said by latest reports to be very precarious; and the failure for $400,000 of a leading merchant in that district connected with three tin plate mills is announced. Fears are entertained that this may be followed by the collapse of other tin plate concerns.

THE FALCON TIN PLATE AND SHEET COMPANY, Niles, Ohio, have accepted the Amalgamated Association compromise scale and the plant of this concern, which has been idle for sometime, resumed operations on Monday, the 29th ult., with a good volume of orders.

THE CUSTOM HOUSE RECORDS of San Francisco show that the imports of tin and terne plates at that port during last year amounted to 23,857,008 pounds, valued at $671,596 This exhibit indicates a falling off of nearly 50 per cent. as compared with 1893. The decrease is attributed to heavy stocks left over from that year.

MERCHANT & CO. (INC), of Philadelphia, New York and Chicago, have issued a bright illustrated card advertising their Tandem continuous roofing tin. A man is represented in the three stages of sleeping, waking and being wide awake, which are adroitly worked in as a direct appeal to the reader. The advantages of the Tandem tin are then tersely and takingly set forth.

Labor and Public Carriers.

The Brooklyn trolley car strike has brought out a flood of confused utterances in the public press, both editorially and through correspondents, says *The Iron Age*. There has been a good deal of weak sentiment and very little calm reasoning. There has been much dilly-dallying with serious issues and altogether too little vigorous action and emphatic talk. No sharp, clear presentation has been made of the rights and the responsibilities of the three parties to the contest. When companies operating under charter from the State are performing a service for the general public, the situation is radically different from that involved when there is a disagreement between a private employer and his men. A third party intervenes, which has its rights and its duties, and that is the public as represented by local or State government. The carrier derives special privilegcs through the grant to him of a complete or partial monopoly, and incurs responsibilities which should be clearly defined. He has duties to perform as against the other two parties, the employees and the public. Reciprocal obligations rest with the employees, who share with the employer his responsibility as to the public.

It may be acknowledged that hitherto both companies and men have usually proceeded on the assumption that their relations were simply governed by their own will. In the Brooklyn strike the rights of the public have been asserted and that in a way which needs very sharp correction. Judge Gaynor has undertaken to define them. He may have correctly interpreted the law. If he has, the laws must be subjected to a thorough modification. It would be a crying injustice if public carriers were to be bound to perform their service without any reference whatever to their relations with their men.

The great trouble which lies at the bottom of the whole matter is that one of the three parties is absolutely irresponsible, and that is the body of men who constitute the operatives. They are not collectively or individually responsible financially. If organized, their leaders, or the majority of their members, have not power enough over the bad element to prevent violence and breaking of the peace, even though they must know that such behavior is the worst that can befall their cause.

Apparently the only party which can be held readily to the full measure of its responsibility is the common carrier. Its capital is fixedly invested. Its property is tangible and easily seized, and apparently the socialistic trend of some of our modern judiciary prefers to move against it as offering the line of least resistance.

The assertion of the rights of the public in matters of this kind is all very well and good, but those rights can only be maintained when the obligations with which they are coupled are fully met. The principal of these obligations is the maintenance of peace, which the men share, and the full protection of the other parties in interest, which rests with the Executive as the representative of the people. In Brooklyn that protection was not afforded and for that reason no compulsory measures against the public carriers are justified.

As it is, the utter irresponsibility of one party makes the questions at issue difficult of solution. It has been suggested that both employers and employees who are engaged in service of a public character should not abandon their work without giving ample notice. Such a condition would be valuable as a protection to the public, but there is no means whatever for enforcing it upon the men. They could not and would not give any bonds as security for the performance of such a contract, any more than they do now for the carrying out of one of the most fundamental duties of every citizen—that of keeping the peace. It is evident, then, that where no guarantees of good behavior whatever exist, the only course is the sharpest compulsion, sharper by far than that which has characterized the action of municipal and State governments in the Chicago and the Brooklyn strikes.

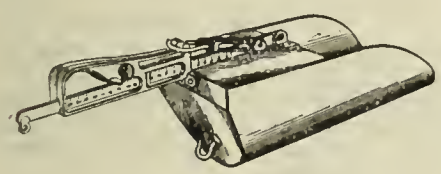
Building Operations in 1894.

The returns of the Department of Buildings of the City of New York for the year ending December 31, 1894, present, says *Carpentry and Building*, an interesting study, showing, as they do, the variety of buildings for which plans and specifications were filed, and also the amounts involved in their erection. Considering the extreme business depression during the 12 months covered by these returns, and the gloomy outlook at the beginning of last year, the figures cannot fail to be regarded as better than generally expected. True it is that the total valuation of building operations for 1894 falls a little short of 1893, but on the other hand, the number of plans filed with the department shows an increase of several hundred, which brings the average cost per building considerably lower than for 1893, when it was the highest on record. The returns of the Department of Buildings show that during the past year 2583 structures were planned to cost $51,673,997, as against 2284 buildings, costing $54,859,318 in 1893. Considering first the private dwellings, we find that there were 1149 for which plans and specifications were filed, estimated to cost $10,981,095, this being an increase over 1893 in the number of dwellings projected, but representing a slight decrease in the valuation. Of flats and tenements there were 777 projected in 1894, calling for an expenditure of $18,020,500, while for hotels, stores, churches and school houses 181 permits were granted, the amount involved being $9,759,945. The number of office buildings planned last year was 21, being just half the number in 1893, but costing nearly the same. Of workshops and manufactories there were 88 projected last year, estimated to cost $3,399,550, while in 1893 there were 141 projected, estimated to cost $3,296,400. The plans filed for miscellaneous buildings, stables, &c., numbered 367, calling for an outlay of $2,944,757. Of this number 19 were for places of amusement, estimated to cost $1,373,700. The plans and specifications for alterations to buildings filed and acted upon by the Department during the past year numbered 1902, estimated to cost $4,888,610. These latter figures as compared with 1893 show a heavy decrease, especially in the amount of money involved.

THE RETAIL STORE.

Combined Scoop and Scale.

G. Sanger, 4110 Pennsylvania avenue, St. Louis, Mo., is placing on the market a combined scoop and scale, as illustrated herewith. The mechanism for weighing is ingeniously arranged,



Combined Scoop and Scale.

and can be used as a scoop separately. There is a hook attached to the bottom of the scoop for weighing meats or bulky packages of any kind. The device is strongly made, and is graduated to weigh from ⅛ ounce to 4 pounds.

Tubular Steel Wheelbarrows.

The wheelbarrows shown herewith, adapted to dirt, coal, coke and ashes, are offered by the Kentucky Mfg. Company, Covington, Ky. The manufacturers remark that in the construction of tubular steel barrows the best material and skilled labor are employed. It is

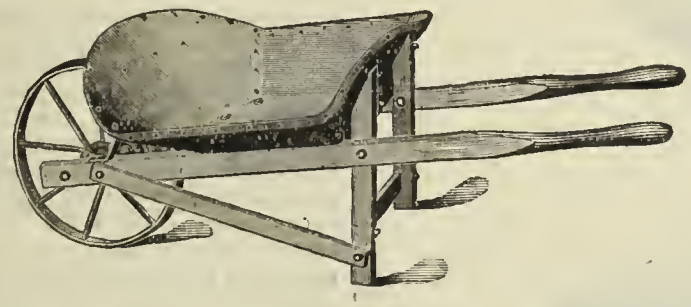


Fig. 1.—Dirt or Canal Barrow.

explained that the trays are made in a substantial manner, with a band of iron securely riveted around the top part, and that the corners are made double where the greatest strength is required. The Howell suspension steel wheel is used on all the company's barrows. In addition to the barrows shown the company make tubular steel barrows adapted to dirt, canals, mining, foundries, rolling mills and pig iron. It is stated that the tubular frames with steel cross bars are so constructed that the tray can be easily adjusted in a workmanlike manner, thus making light, strong and durable barrows.

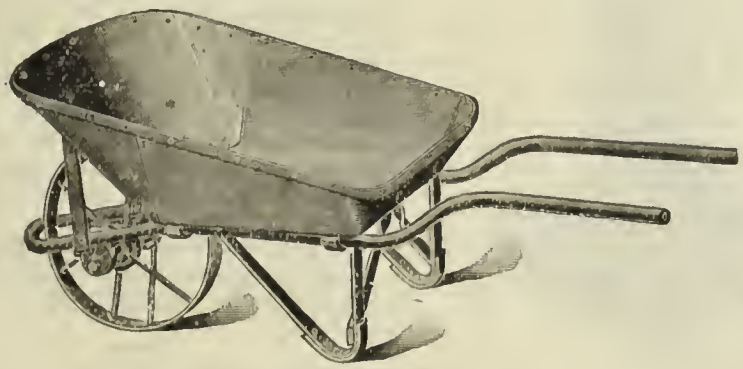


Fig. 2.—Coal Barrow.

MEMORANDA.

SILVER & Co , 304–314 Hewes street, Brooklyn, N. Y., are paying very close attention to the development of new goods in aluminum this season. They have now increased their line of Brooklyn pure aluminum specialties to about 30 articles, and propose to extend their efforts in this direction still further. Messrs. Silver report a very gratifying growth in the demand for aluminum household ware as its merits become more generally appreciated. In order to provide adequate facilities for their growing business in aluminum goods, the firm propose making some important additions to and improvements in their factory at an early date.

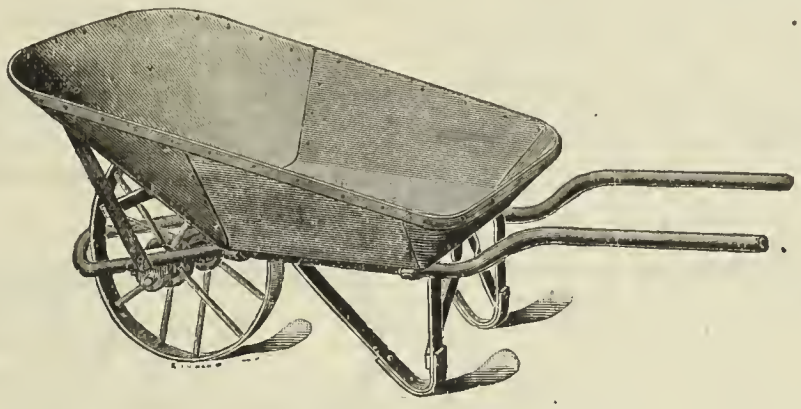


Fig. 3.—Coke or Ash Barrow.

THE FIRM of White & Porter, Bristol, Conn., dissolved on January 14, Mr. White continuing at the old stand, while Mr. Porter, with his son, under the title of J. M. Porter & Son, will open a stove, furnace, tin and plumbing store on Main street.

THE MICA MFG. COMPANY will, on and after February 1, be located at 88 Fulton street, New York City. An illustrated catalogue, published by this firm, contains cuts of a very great variety of mica goods which they manufacture and sell. These include all sorts of canopies for gas and lamps, besides shade protectors, chimneys, screens, &c.

THE LAWRENCE & MCDOWELL COMPANY of Moira, Franklin County, New York, have been incorporated with a capital of $10,000 to manufacture tinware and do a general plumbing and hardware business. Directors: W. A. Lawrence, Helena Lawrence and David A. McDowell of Moira.

NORTH BROS. MFG. COMPANY, Philadelphia, Pa., John H. Graham & Co., 113 Chambers street, New York, agents, issue an 1895 catalogue devoted to Ice Cream Freezers, Ice Chippers, Freezer Clamps, Ice Shaves, Meat Cutters, Scales, Beaters, Cake Pans, Cake and Batter Mixer, Candlesticks, Fluting Machines, Hand Fluters, Wringers, Tobacco Cutters, Tobacco Shaves, Faucets, Christmas Tree Holder, &c. The company call attention to the advance in the list prices of original Knox Fluters to the same list as Crown Fluters, and to the revision of the list prices of repairs for Ice Cream Freezer and Fluting Machine repairs.

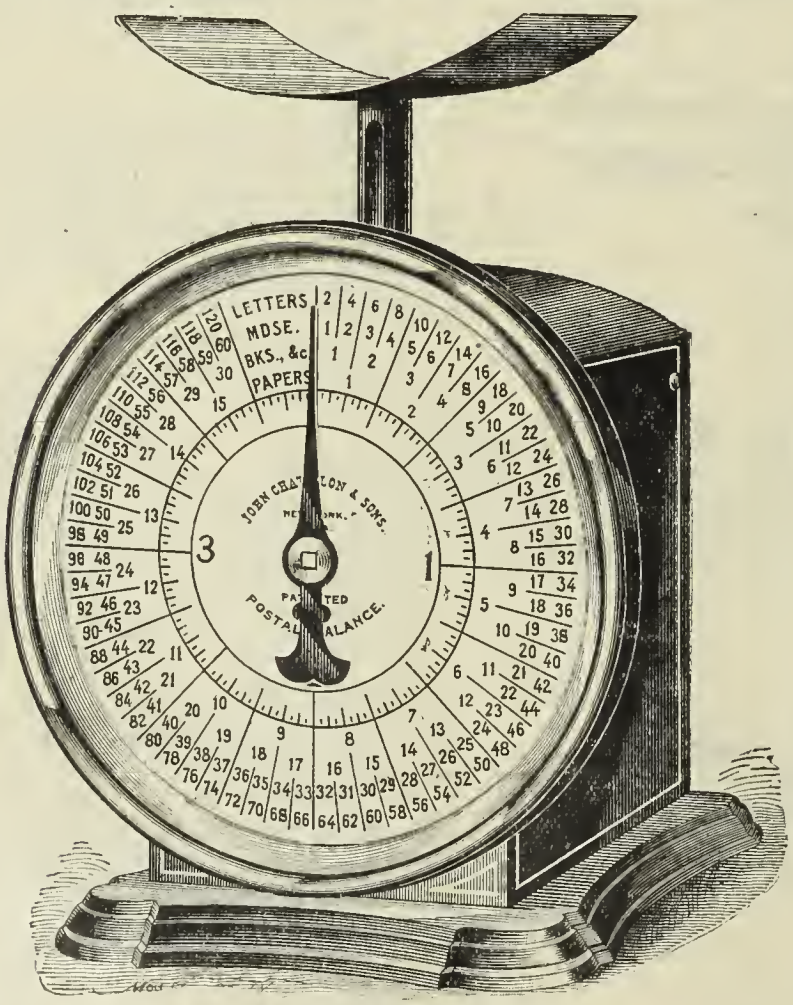
THE STAR MFG. COMPANY, established two years ago at Canton, Ohio, manufacturers of the Crystal Valve Oil Can, have concluded arrangements by which they become successors to the F. B. Smith Novelty Company, and will in the future manufacture the Smith Novelty Force Pump, brass and aluminum kitchen ware and advertising novelties. They will occupy the premises formerly used by the F. B. Smith Novelty Company, at East Fourth street, which are furnished with facilities for manufacturing a full line of hardware specialties. At the annual election, held January 25, the following officers and Executive Board were chosen: President, J. A.

Brobst; vice-president, F. H. Wagner; secretary and treasurer, Frank Schwerter; superintendent, J. Kawer. C. C. Bow is also a member of the Executive Board.

The Bowen Mfg. Company, Fond du Lac, Wis., have made a change in the exterior ornamentation of their refrigerators. They have introduced more elaborate carving on the door panels, inserted the name of the refrigerator on the ice chamber panel, with appropriate scroll work, and added bolder designs on frieze and skirting, with the result of greatly improving the appearance of these goods.

New Favorite Postal Balance.

John Chatillon & Sons, 85 93 Cliff street, New York, have brought out the New Favorite postal balance as here illustrated. The body is made of sheet steel, japanned and decorated in gold and other colors. A white dial with distlnct large black figures is protected by a glass front in a brass nickeled frame. It will be noticed the figures, which are ⅛ inch long, are not inverted in the lower section, to conform to the circle, but so placed as to be correctly read at a glance. The outer circle of figures indicate the postage in cents for first class or sealed matter, as letters, &c., in multiples and fractions of weights. The same principle applies to the remaining circles of numerals on merchandise, books, &c., and papers, all showing the postage for the different classes or sub-divisions to any part of the United States, Canada or Mexico. The inner circle is graduated to the capacity of the scale by



New Favorite Postal Balance.

⅛ ounces to 4 pounds avoirdupois. The pan at the top is nickeled brass. The adjustment of the pointer is made by a thumb screw on the top of the scale. The material used in the construction of the scale is at once strong, light and attractive. The outside dimensions are: Hight, 10 inches; depth, 7½ inches, and dial, 7 inches. It is numbered 026 L, and each scale is packed separately in a dovetailed wood box with slide cover.

New Can Openers.

The Brown & Dowd Mfg. Company, Meriden, Conn., have just brought out a new can opener, which will be put on the market under the name Queen, and a new comblnation can opener and corkscrew, which will be known as the King. They are represented in the illustratlons given herewith. These tools are described as struck from a single piece of steel, to which a blade of cast steel, tempered, is securely riveted, and in the combination tool the corkscrew is tempered steel wire and is made wlth special reference to lightness and convenience. These tools, it is claimed, will work in any direction, and are put out as examples of neatness and lightness combined with necessary strength and low cost. The corkscrew, as will be noticed, when not in use may be shut into the handle, and when in that position does not in the least interfere with the use of the can opener. The King is finished in nickel plate and the Queen japanned.

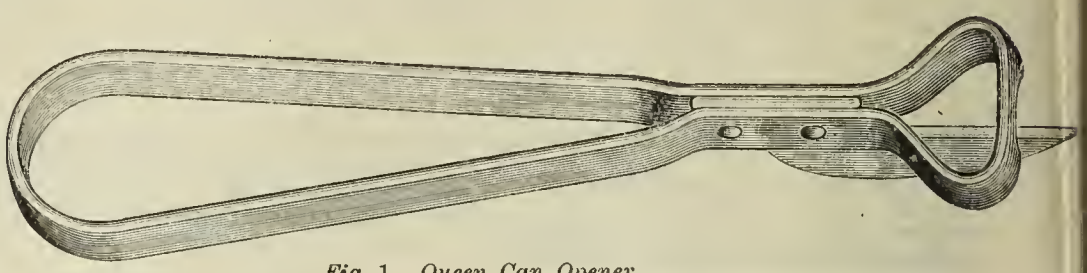


Fig. 1.—Queen Can Opener.

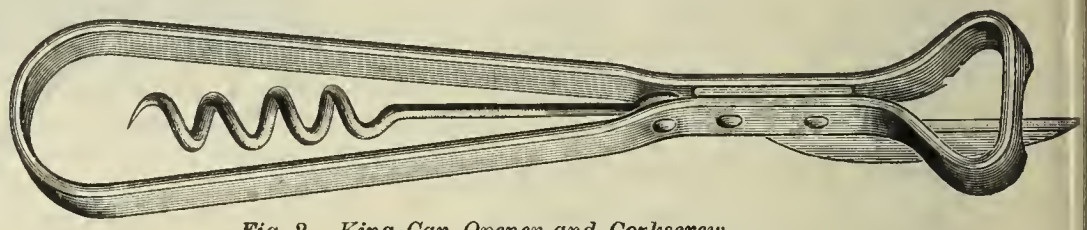


Fig. 2.—King Can Opener and Corkscrew.

Representatlve Childs of Illinois introduced into the House last week a bill to incorporate the Natlonal Central Railway Company, a corporation to be empowered to lay out and equip a rallway from a point on the Hudson River, or from some point in New York City to some point in San Francisco. The project is an immense one, involvlng an outlay of some $400,000,000. A preamble to the bill says that it is declared to be one of the fundamental duties of the Government to provide for common defense and promote the general welfare of its people, and that such defense and welfare can be subserved by connecting the two great centers of population upon the Atlantic and Pacific coasts by the shortest available line for the transportatlon of Government troops, the United States mails, the people and their commerce. The present route can be reduced in distance by 600 or 700 miles.

The ninth annual report of the New York State Factory Inspector, submitted to the Legislature on Monday, recommends, among other things, that eight hours be made the limit of a day's work for women and for children under 16 years of age in factories and mercantile establishments. Legislation is urged regulating the erection of fire escapes on hotels and also for the means of egress and sanitary arrangements in halls, theaters, &c. The report also recommends that inspectors of steam boilers and examiners of stationary engines be appointed with suitable powers.

During the year recently closed, 64 West Australian enterprises, with an aggregate capitalization of $27,600,000, were placed on the London and Scottish markets, the majority during the past three months of the year. Mining and land companies are the main industries for which the support of British capitalists is desired.

HEATING & PLUMBING.

NEW WORK AND CONTRACTS.

THE EXETER MACHINE WORKS, Boston, Mass., have recently shipped five Exeter sectional steam boilers to Chicago for heating five apartment houses owned by Burley & Co.

THE SCHOOL COMMITTEE of Amherst, Mass., will receive bids for heating and ventilating the High School Building. These bids must be based upon the mechanical and gravity systems and must be in the hands of the chairman by Saturday, February 23.

SHAPLEY & WELLS, Binghamton, N. Y., have secured the contract to ventilate the court room, at $1585.

J. G. MAHONEY, Spring Valley, N. Y., has the contract for the tinning and plumbing on the house being erected for Edward Earl.

FRANK E. GODDARD is building a residence at Hartford, Conn., that will have a plumbing system and a hot water heating plant.

DISLEY & WEYAND, Waterbury, Conn., have the contract for the plumbing in three stores and tenements to be erected by H. Zehnder.

WALLER & CAREY are finishing up their contract on E. C. Stoughton's new house in Thomaston, having put in a Winchester heater. The firm have recently moved to 172 East Main street, Waterbury, Conn.

E. A. LETTNEY, Crown street, New Haven, Conn., has taken the plumbing of a house for W. H. Lettney; also a house on Howard avenue, one on Wallace street, West Haven, and the tinning of W. H. Brown's house.

J. VREELAND of Congress avenue, New Haven, Conn., is doing the plumbing in Thos. R. Trowbridge's new double house on Portsea street, besides one on Hurlburt street and one in Allingtown.

THE HEATING APPARATUS in the Hospital for Contagious Diseases, at Detroit, Mich., is to be replaced by a new one.

THE BUILDING COMMITTEE of the Board of Control, Scranton, Pa., awarded the contract for heating and ventilating the new High School to Hunt & Connell for $29,478. The lowest bid was that of Gaylor & Eitapence of Binghamton for $28,937. The disposition to spend the citizens' money at home for the benefit of local workmen influenced the award. The heating system was designed by Fred. P. Smith, the New York heating and ventilating engineer.

M. J. REDMOND & Co., Wallingford, Conn., have been awarded the contract for fitting up the Masonic Home with heating apparatus.

E. W. NOYES of Brockton, Mass., has the plumbing contract for Joseph Pratt's house at Onset.

TWO SCHOOL BUILDING are to be erected at DuBois, Pa., for which the heating contracts have been given to the Peck-Williamson Company, Cincinnati, Ohio.

GEO. J. EGGE, La Crosse, Wis., has received the contract for doing the plumbing in Andrew Hanson's new building.

THE CORTLAND CITY HOSPITAL ASSOCIATION took possession of their property, 86 North Main street, Cortland, N. Y., and will move in as soon as some necessary repairs can be made. Plans will soon be perfected to heat the building by steam.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until February 19, for the plumbing of the United States Court House and Post Office Building at New York City. Drawings and specifications may be obtained from the Supervising Architect at Washington, or at the office of the superintendent at New York.

THE FULLER & WARREN COMPANY, 147–149 Lake street, Chicago, are to place two warm air furnaces in the flat building of C. J. Colburn, Lawndale, Ill.

M. L. MANDABLE, 258 Clark street, Chicago, has the contract for the plumbing, gas fitting and sewerage in the residence of Judge Stein, Grand boulevard and Forty-fourth street.

THE JOHN DAVIS COMPANY, 69–79 Michigan street, Chicago, are to install a steam heating plant in the school building at Fulton street and California avenue.

THE CHARLES H. SIMMONS COMPANY, 72 Market street, Chicago, are to install hot water heating plants in the residences of Dr. Jared Bassett and Prof. Robert D. Sheppard, Evanston, Ill.

COOK & CHICK, 253-255 Kinzie street, Chicago, have the contract for steam heating in the two four-story apartment buildings of T. E. O'Brien, Prairie avenue and Forty-seventh street.

THE FULLER & WARREN COMPANY, 147–149 Lake street, Chicago, have contracts for warm air heating in the residences of J. L. Cochran, Edgewater, and John E. Cowles, Hyde Park.

JACOB G. WEBER, 244 North Clark street, Chicago, has the contract for the plumbing, gas fitting and sewerage in the three-story flat buildings of H. Schmedtgen, Elm and Sedgwick streets.

FRANK J. RUH, 1204 Diversey street, Chicago, has contracts for the plumbing, gas fitting and sewerage in the following residences: Dr. Groynee, Halsted street and Evanston avenue; A. Guiner, Jefferson and Huntingdon avenues; T. Meyer, Edgewater.

SEALED PROPOSALS will be received until January 22 for heating and ventilating the Court House at Racine, Wis. Blue prints of the building will be furnished on application. Proposals are to be sent to John Dixon, County Clerk, Racine, Wis.

JOSEPH B. BREEN, 368 West Van Buren street, Chicago, has just finished a bathroom costing $750 in the residence of M. W. Ryan, Throop and Adams streets. He is also doing the plumbing, gas fitting and sewerage in the flat building of A. J. Cronin, Prairie avenue and Forty-fourth street.

M. L. MANDABLE, 258 Clark street, Chicago, is doing the plumbing, gas fitting and sewerage in the ten flat building of Mrs. Vincent, Grand boulevard and Forty-third street.

J. P. ADAMSON, St. Paul, Minn., was awarded the contract for the plumbing in the Dale Street Infirmary.

BAKER, SMITH & Co., New York, have placed an order with the American Radiator Company for 625 radiators of the National pattern, which will be used in the Presbyterian Building at Fifth avenue and Twentieth street, New York, for which they have the heating contract.

THE PEOPLE of Millville, N. J., have inspected the heating plant in their new school and are much pleased with the results of testing it. It was designed by L. W. Gould of Vineland and installed by Alfred Brandriff, using large size Magee Combination heaters.

THE HAMSLEY METAL ROOFING COMPANY, 18 Cliff street, New York, are doing the sheet iron work and setting three large Sturtevant blowers for the exhaust ventilation of a factory in Brooklyn.

HUGH WATT, 339 Dearborn street, Chicago, is remodeling the plumbing in the residence of William Kent, 3616 Grand boulevard.

C. & R. SCHWEITZER, 187 Centre street, Chicago, are remodeling the plumbing in the flat building at 3608 Vernon avenue.

D. D. DEWAR & Co., 335 Sixty-third street, Chicago, have the contract for plumbing, gas fitting and sewerage in the two residences of Joseph Cormack, 680–682 Vernon avenue.

KROESCHELL BROS. COMPANY, 41-59 Erie street, Chicago, have contracts for steam heating in the flat building of J. J. Kane, 195 North Clark street, and residence of F. P. Kenkel, Wilmette, Ill.

METZ BROS., 107 Twenty-second street, Chicago, have the contract for steam heating in the residence of C. H. Platt, 3300 Wabash avenue.

JAMES J. WALSH, 78 Thirty-first street, Chicago, is finishing the plumbing in the eight-flat building of Judge Pendergast, Pearson and Cass streets.

J. HALL, 3723 Cottage Grove avenue, Chicago, is to do the plumbing, gas fitting and sewerage in the two store buildings at 3757–3759 same street.

BARR & CREEDON, Starkey, N. Y., have completed their contract for heating Starkey Seminary by steam, and the work is accepted by the trustees.

LOCK BROS., Williamstown, Mass., have the contract for the plumbing of the new Danforth Block.

THOMAS OAKES, Hartford, Conn., has just closed a contract for 16 Page hot water boilers and 3500 feet of radiators. He is doing the plumbing and gas fitting in a house of six tenements for Robert Allyn and is doing the plumbing, using the goods of the J. L. Mott Iron Works, in the residence of C. C. Beach.

THE BOARD OF EDUCATION for the State of Connecticut will receive proposals for a heating and ventilating apparatus for a Normal Training School Building now being erected in New Haven. These proposals will be according to plans and specifications, to be seen at the office of the Board in Hartford, also at the office of Hartwell and Richardson, architects, 62 Devonshire street, Boston. Proposals must be delivered at the office of the Board in Hartford not later than February 18, 1895.

A report submitted by the Senate Committee on Pacific railroads favors a long time extension of the Union Pacific's debt to the Government, arguing that absolute foreclosure and sale would involve a clear loss of $50,000,000. Federal operation of the road is not regarded as desirable.

STOVE TRADE NOTES.

Cupola Tuyeres.*—IV.

BY DR. EDWARD KIRK.

Bottom Tuyere.

In Fig. 17 is seen the bottom or center blast tuyere. This tuyere, as will be observed, passes up through the bottom of the cupola instead of through the sides, and admits the blast to the center of the cupola at the same level as the side tuyeres. It is not designed to change the nature of the iron by forcing the blast through the molten iron in the bottom of the cupola, and, in fact, the blast has no more effect upon the quality of iron when admitted in this way than when admitted through side tuyeres. A tuyere when placed in the bottom of a cupola, unlike a side tuyere, is brought in direct contact with heated fuel and molten iron, and it must be made of a refractory material or protected by a refractory material if made

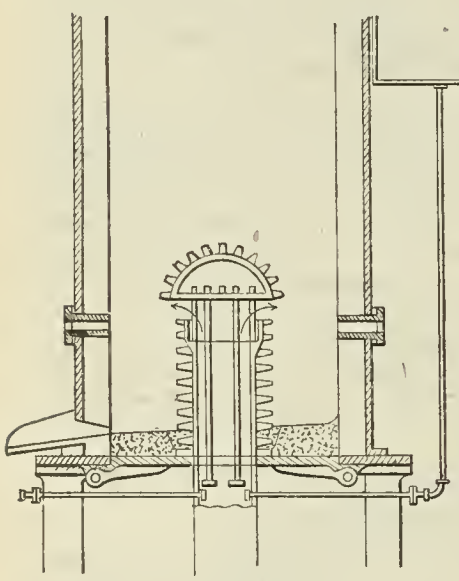


Fig. 17.—Bottom Tuyere.

of metal. The tuyere shown in the cut is made of cast iron and is provided with a water space between the out and in side, through which a stream of water constantly flows when the tuyere is in use from a small pipe connected with a tank placed alongside the cupola or on the scaffold. But it has not been found necessary to keep the tuyere cool with water in short heats, for the heat in a cupola under the tuyeres is not sufficiently intense to melt cast iron, and the tuyere may be sufficiently protected against molten iron dropping upon it or coming in contact with it by a thick daubing of refractory material held in place by the prickers cast on the tuyere. The mouth of a bottom tuyere must be covered to prevent molten iron, slag and fuel dropping into it in its descent to the bottom of the cupola. This is done with a rounded cap placed on top of the tuyere to throw off the molten iron and slag and the blast is admitted to the cupola through an opening around the tuyere under the cap, as indicated by the arrows. The tuyere must be carefully daubed and dried before it is put in place. It cannot be attached to the bottom doors and must be put in place through a hole in the doors after they are put up and withdrawn in the same way and removed before the cupola is dumped to prevent it being broken or injured in falling or by the heat in the dump. It must have an adjustable and removable support and the sand bottom must be made up very carefully around it to prevent leakage of molten iron. The tuyere often gets fast in the bottom and the men are frequently burned in removing it, and it sometimes gets filled with iron or slag and spoils a heat.

The bottom tuyere has been tried a great many times by foundrymen at different periods, and is nothing new. In conversing with several old foundrymen in Massachusetts about 17 years ago I learned that the bottom tuyere had been used in that State away back in the '40's, and at one time was quite popular with foundrymen there; and I have met a number of other old foundrymen in different sections of the country who had tried the tuyere years ago and given it up. A bottom tuyere was patented by B. H. Hibler in this country August 13, 1867. Ireland & Voisin used a bottom tuyere in their cupolas many years ago, and had these practical men found any advantages in it over the side tuyere it would, no doubt, have been brought into general use in cupolas before this.

The bottom tuyere was brought prominently before the foundrymen of this country by an ably written article by Thomas D. West, read before the Western Foundrymen's Association at Chicago, Ill., October 18, 1893, in which he describes his experiments with the tuyere and claims for it a great saving in fuel and cupola lining. Since the publication of Mr. West's article a number of foundrymen have published their experience with the tuyere and all claim it effects a great saving in lining and fuel. But if these foundrymen have not discovered some new feature in the tuyere that was overlooked by experimenters with it years ago, it will never come into general use.

Size of Tuyeres.

Foundrymen make a great mistake in placing small tuyeres in their cupolas, with a view of putting the blast into the cupola with greater force and driving it to the center of the cupola with the blower. Air may be driven from a small opening by a blower with greater velocity than the same volume of air from a large opening, but the air from a small opening loses its velocity when it strikes a solid body, just the same as the air from a large opening. When the blast from a small tuyere strikes the solid fuel in front of a tuyere its velocity is gone and it will not penetrate any further into the stock than the same volume of blast from a large tuyere. It is not the velocity at which the blast passes into a cupola that drives it to the center, but the force behind the blast. Neither is it the velocity of the blast that does the melting. It is the volume of blast. It therefore follows that nothing is gained in melting by forcing the blast through a small tuyere into a cupola with great velocity, and much is lost by increasing the power required to run the blower to force the blast through a small tuyere.

The small tuyere was one of the greatest mistakes made in the old-fashioned stave cupola. In these cupolas, many of which I have seen, only two tuyeres of 3 or 4 inches diameter were placed in a 30-inch cupola and the improvement made in melting in the modern cupola is largely due to the enlargement of the tuyeres and the free admission of blast to the cupola.

The combined tuyere area of a cupola should be equal to three times the area of the outlet of the blower when the blower is of a proper size for the cupola. These dimensions may seem large at first sight, but it must be remembered that the size or area of a tuyere when a cupola is not in blast does not represent the area of the tuyere when the cupola is in blast or the volume of blast that may be admitted to the cupola by the tuyere. When a cupola is in blast the space in front of the tuyere is filled with fuel weighted down by tons of iron. This fuel closes the mouth of the tuyere and the outlet is represented by the number of crevices between the pieces of fuel through which the blast may escape. Should a large piece of fuel fall in front of a tuyere the blast cannot remove it and the tuyere may be closed and rendered useless. Small tuyeres are more liable to be closed in this way than large ones, and for this reason small tuyeres should never be placed in a cupola. Small tuyeres, furthermore, are not only more liable to be stopped off by the fuel but also tend to promote bridging by admitting an insufficient amount of blast at certain points.

* Copyrighted, 1894, by Edward Kirk.

The A. J. Lindemann & Hoverson Company

of Milwaukee, Wis., have extended their line of gasoline stoves for the coming season. They manufacture Anchor juniors of one, two and three burners; Anchor high juniors, with two and three burners; Anchor step juniors, with two and three burners on top and a double burner in the step; Star juniors, with one, two and three burners; Star high juniors, with two and three burners; Star step juniors, with two and three burners in top and a double burner in the step; Anchor individual burner stoves, with two and three burners in top and one double burner in the step; Anchor single generator stoves, with two and three burners in top and one double burner in the step. They also manufacture the L. & H. process line, which consists of the L. & H. process cabinet with two top cooking holes, two top holes and step, or three top holes and step; also open frame two and three burner stoves without the step. The cabinet stove is a very pretty construction, with a large high shelf, full sized oven and a burner constructed on a wholly new plan. The individual burner and generator stoves are supplied throughout with the

L. & H. removable safety tank and with double valve burners in all but the cheapest grades. The generator is started without smoke or odor or a flashing fire, all of which is avoided by the use of a small quantity of alcohol to heat the burner, an alcohol receptacle being arranged in a convenient place. In addition to gasoline stoves the company manufacture the L. & H. gas ranges in four styles, small gas stoves and lamp stoves. On all lever valves the words "open" and "closed" are placed, to positively catch the eye of the operator. Further additions to their line of stoves are contemplated by this enterprising company.

The Clark Stove Company.

According to Kansas City papers the recently incorporated Clark Stove Company will be operating a considerable plant for the manufacture of steel ranges by April 1. A plot 150 x 300 feet in dimensions alongside the plant of the Armourdale Foundry Company, southeast corner Kansas avenue and Adams street, Armourdale, will be occupied by the buildings of the new factory. Ground will be broken at once for three brick structures—a foundry 55 x 128 feet, a two-story mounting room 55 x 60 feet and a two-story storage and office building also 55 x 60 feet. The capacity of the plant will be 40 steel ranges per day.

The new enterprise is incorporated by R. M. Clark, A. M. Clark, O. A. Clark, R. A. Clark and H. N. B. Umbach, with $100,000 capital, of which $50,000 is paid in. R. M. Clark is president and H. N. B. Umbach is secretary and treasurer. The Kansas City office and store is at 704 Main street. Fifty thousand dollars in 7 per cent. interest bearing preferred stock will be sold. The buildings will cost $20,000. The new and original machinery will represent at least a like sum.

R. M. Clark, the originator of the enterprise, is from Madison, Wis., and latterly from McPherson, Kan., where he conducted a large stove business. He is a well-known mechanic and is the inventor of the three-wheel plow which is now universally used. After several years of inventive labor he has perfected the Clark steel range, which, it is stated, may be used with coal or gasoline. It has been made by contract in Kansas City for some little time, and the success of its sale has interested Robert Gillham and Gus P. Marty, proprietors of the Armourdale Foundry, in its manufacture and promotion on a large scale. They are so sure of the worth of the invention, and have such faith in Kansas City as a good point for manufacture and distribution, that they have contracted to erect the necessary buildings upon their ground and accept a rental from the stove company. The facilities of the plant will be modern in every respect. The machinery includes labor saving devices which will greatly cheapen the production.

HOWARD M. CARY, Boston agent for Sam S. Utter, died January 28, aged 58 years. Mr. Cary was well known throughout the New England trade as a man of sterling business integrity and enjoyed the respect of a wide circle of friends. We understand that the Boston agency will for the present be discontinued and that it is the wish of Mr. Utter that dealers forward their orders direct to 113 Beekman street, New York City.

ODD PLATES.

THE CLEVELAND FOUNDRY COMPANY of Cleveland, Ohio, and with branches in Boston, New York, Chicago and San Francisco, have just issued an attractive catalogue of 68 pages, relating to their leading specialties. Within the paper covers of the publication are found illustrations of many new goods not contained in last year's edition. The company announce that they are preparing still other lines of goods, both for oil and for gas, circulars relating to which will be distributed from time to time as the productions are ready for the market. In their announcement to the trade they refer to the fire on October 10 of last year which destroyed the greater portion of their works, and while this was a serious loss, the reconstruction has given the company the opportunity to enlarge and rearrange the buildings in such a way as to greatly increase their facilities and enable them to handle orders more promptly than ever before. The catalogue before us is taken up with illustrations of the Puritan oil and gas heating and cooking stoves, which are offered in great variety, and which embody in their construction features which have established for them a gratifying reputation. Attention is given to ovens, broilers, registers, ventilators, sad irons, floor borders, &c, as well as gas radiators, drums, &c. The catalogue is neatly printed and is bound in attractive paper covers.

WHITE, WARNER & Co., Taunton, Mass., manufacturers of the well-known Household lines of ranges and stoves, are sending to their customers a very handsome piece of cardboard standing 15 inches high and representing a lyre, the frame of which is decorated with 12 variously colored roses of different varieties. Behind each of these is a calendar, there being one for each month in the year. The calendar is arranged to either hang or stand.

THE BUSSEY & MCLEOD STOVE COMPANY of Troy, N. Y., resumed operations at their plant January 24. They now employ a force consisting of 150 men. It is their intention to increase the number in the near future.

THE STOVE MOLDERS of Albany, N. Y., have been uneasy for some time past and have held several meetings to discuss the situation. They are complaining of the long shut down of stove foundries in that city, and that with no work they are still obliged to pay their dues to their national organization. Committees were appointed to wait upon the management of one or two of the stove foundries and present the grievances concerning the extended idleness. As the foundries are resuming as rapidly as the condition of business affairs warrants, no trouble is anticipated, and everything will probably be amicably arranged by the employment of the old forces of molders.

C. B. SMYTHE AND W. F. HABICHT, representing F. M. Borden & Bro., Philadelphia, are visiting the trade in the interests of gasoline and gas stoves and refrigerators, and are sending in with their orders for immediate shipment long lists of stove repairs, of which the house make a specialty. They are also showing photographs of the Novelty and Leaf lines of stoves and ranges.

AT THEIR ANNUAL MEETING, recently held in St. Louis, the Buck's Stove & Range Company elected the following officers: F. F. Palms, president; G. H. Barbour, vice-president; J. W. Van Cleave, treasurer and general manager; H. C. Thompson, secretary; F. F. Palms, G. H. Barbour, J. W. Van Cleave, Jeremiah Dwyer and F. W. Gardner, directors.

THE RINGEN STOVE COMPANY, 414 North Broadway, St. Louis, Mo., favor us with a copy of their 1895 catalogue relating to Quick Meal gasoline stoves. It is made up of 30 pages, printed in blue-black ink on a good quality of paper and bound in the same style of paper covers which has characterized the annual publications of this company for several years past. The opening pages are devoted to a new line of Quick Meal ranges of the evaporating style and embodying the latest improvements. Numerous varieties are shown running from the two-burner construction designed for the use of a small family up to the three-burner and step range having oven, warming closet and steel base, adapted for hotel and restaurant use. One of the varieties of this stove is shown in the catalogue in connection with a canopy. Other pages are given up to Quick Meal ovens, saucepans, plumbers' furnaces, paint burners, torches, waffle irons, cans, burners, &c. One of the leading features is a page showing the Quick Meal tank for 1895, and the construction of the Quick Meal balance door.

THE TOLEDO STOVE WORKS, located at Auburndale, Ohio, were recently damaged to a slight extent by a fire which originated in the molding room. The loss was fully covered by insurance.

THE GREAT WESTERN STOVE & MFG. COMPANY of Leavenworth, Kan., expected at the date of latest advices to resume operations on Friday, February 1, with a full force.

THE STANDARD LIGHTING COMPANY of Cleveland, Ohio, have found it necessary to enlarge their manufacturing facilities in order to handle their rapidly increasing business. They have just awarded contracts for an addition to their present plant which will give a frontage of 400 feet and a depth of 150 feet, the building being three stories high. This new space will be largely devoted to the manufacture of gas stoves and when the improvements are completed the company state they will have the largest gasoline and gas stove factory in the world.

THE BELLEVILLE STOVE COMPANY of Belleville, Ill., have recently elected the following Board of Directors: Charles Becker, Joseph Fuess, George A. Rebham, Frederick Sattler and J. J. Weingaertner.

THE MOLDING DEPARTMENT of the Weir Stove Company, Taunton, Mass., resumed operations on Wednesday, January 23, and the other departments resumed on the day following.

AT A RECENT MEETING of the stockholders of the Western Stove Mfg. Company of St. Louis, Mo., the following directors were elected: Joseph T. Dugdale, Lucas Edel, J. H. Woltering, B. H. Sanders, H. F. Lucey, Antone Werbich, George Reiners, Wm. T. Dugdale and John M. Schurman. At a subsequent meeting of the Board of Directors Joseph T. Dugdale was elected president and Lucas Edel secretary and treasurer.

F. M. BORDEN & BRO., Philadelphia, Pa., are sending out three new gasoline stove catalogues. One is in a mottled

blue cover, with the title embossed in gilt, and is devoted to the New Process vapor stoves. The text is in two colors on fine paper, with half tone engravings of the various styles of the New Process stoves in cabinet, semi cabinet and steel frame finish. The Reflex oven is shown as a specialty, one view representing it "knocked down" for shipping, when it occupies but little space. Sectional views are given of the valve and of the burner drum. The remaining pages are devoted to cooking utensils and instructions, with cuts for ordering repairs. Another catalogue is in a buff cover, devoted to the Splendid Novelty generating vapor stove, the text being grinted in a dark green ink. Cuts show the stove in several forms, and several pages are occupied with sad iron heaters, toasters, broilers, ovens and cooking utensils. The Globe Junior gasoline stoves are shown in a catalogue printed in blue, and nothing is omitted in the text or pictures to bring the attractions of this line before the trade. Prospective purchasers will find these catalogues an aid in selecting their line of gasoline goods. Attention is also called to the company's line of coal cooks, gas stoves and refrigerators.

GEORGE M. CLARK & Co., with office and factory at 149–161 Superior street, Chicago, Ill., issue an attractive catalogue of Jewel gasoline stoves for the season of 1895. In general shape and size the publication corresponds with those issued in previous years by this enterprising concern, and dealers will find within its attractive paper covers much to interest them. In their greeting to the trade the company refer to the thousands of dealers who have handled Jewel gasoline stoves, and state that 13 years of stove manufacture means with them the ability to furnish repairs for stoves made 13 years ago. Among the new features and improvements incorporated in the process stoves for 1895 are: A new shield that is removable; a clean out slide at the base of the central draft tubes; a lug at each valve outlet in the tank; a wide base bar for all burners; a removable strainer wire, with handle, at the fuel funnel; the tank finished in antique bronze, while the stoves themselves are finished in copper plate decorations instead of nickel plate. The single generator stoves have new high shelves above the top, and there has been added a new 26-inch high stove of the same capacity as the two-burner step stove. In connection with individual burner stoves it is stated that the Jewel-Acmes are fitted with a burner that may be turned low without the complication of two needles, and that the Jewel Junior Safety, 24 and 14 inches high, with Jewel burner and cut off, are supplied at the same price as the Jewel-Acme stoves of last year. In the way of stove furniture the company have added new oven racks that run sidewise, instead of up and down, and are properly adjusted to hold two layers of bread. The catalogue is profusely illustrated and shows in detail the important parts of the Jewel process stove. In connection with the letterpress there are given the various sizes in which the different stoves are made, together with their prices. Remarks about repairs, an index which gives weights, crate charges, prices and telegraphic code words of Jewel gasoline stoves are some of the other features of the publication.

THE CULTER & PROCTOR STOVE COMPANY of Peoria, Ill., are distributing an illustrated circular showing the new pattern of their Peoria Lexington six-hole range intended for using coal or wood as a fuel. The design of this stove is exceedingly attractive, and the finish is of a high order of merit. It embodies the latest features of convenience and utility, and is referred to by the manufacturers as a rapid seller. The company are offering the trade 59 styles and sizes of Peoria-Lexington cook stoves and ranges.

"THE EVANS PURE AIR FURNACE" is the title of a 30 page pamphlet of convenient size, which reaches us from Charles A. Evans, proprietor of the Evans Furnace Works, Thirteenth street, above Buttonwood, Philadelphia, Pa. The heater named is described at considerable length, while illustrations show the general appearance of the apparatus as well as the internal arrangement of parts. The little pamphlet tells what the furnace does and how it does it in a way to interest the trade. Nearly one half of the pages are taken up with testimonial letters from some of those who have used the Evans heaters.

THE TROY NICKEL WORKS, Troy, N. Y., ask us to inform the trade that their crop of dimeand pins has run out for 1895 and that those who have been so unfortunate as not to get one will be remembered in their next.

THE ELLWOOD GAS STOVE & STAMPING COMPANY of Ellwood City, Pa., favor us with copies of two attractive pamphlets which they have issued relating to their specialties for the season of 1895. The larger of the two publications consists of 16 pages neatly printed, profusely illustrated and bound in attractive paper covers. Special attention is directed to the company's line of single generators which are furnished with the Ellwood safety tank, as well as the low-down tank. The Ellwood junior gasoline stoves are constructed with tops, legs and bands of stamped steel while the bodies are japanned and neatly ornamented. They are fitted with the company's No. 2 individual burners which are operated with nickel wheel blunt valve, so that the flames can be turned low without being extinguished. The needle valve is the special feature of the burner, and is easily operated with one-quarter turn. The second pamphlet relates to the Ellwood gas heaters and radiators which are shown in extensive variety. Brief, descriptive particulars are presented in connection with each illustration and the general arrangement is such as to interest the trade.

THE MANY FRIENDS of D. M. Thomas, secretary of the National Association of Stove Manufacturers, will regret to learn of his continued serious illness. The improvement noted in his condition in our issue for December 29 was of short duration, and he was unable to carry out the recommendations of his physicians regarding a trip to Bermuda.

A NEW TRIAL was granted by the Michigan Supreme Court on January 22 of the condemnation suit of the Fort Strect Union Depot Company against the Peninsular Stove Company of Detroit. The trial of this case occupied about two months' time of the Wayne Circuit Court and resulted in a verdict in favor of the stove company for $49,500. This amount represented the damages which the stove company would receive by the construction of the viaduct along River street, adjacent to the stove factory. It was contended that the passing of the locomotives and cars by the side of the stove works would jar the molds and cause great and irreparable damage to the company.

THE ABRAM COX STOVE COMPANY and the Model Heating Company have removed to 52 Dearborn street, Chicago, where they occupy a fine suite of rooms on the second floor. The building has just been rebuilt and modernized throughout, having all conveniences of a first-class office building, including elevator service. The rooms occupied comprise, first, a large sample room and general business office; second, a furnace room, in which furnace parts are shown so as to thoroughly explain the warm air apparatus; next, a special office for the manager, in which steam and hot water boilers are shown in sections, so that their construction can be explained; and last, a private room for drafting, or special work. Thus the new quarters provide much more room and far greater facilities for the dispatch of business than prevlously possessed. A further advantage is gained in the closer proximity to the center of the steam, hot water and furnace district. The warehouse will from necessity be separated from the offices, but will not be far away. The local management of these companies continues in the hands of Edward P. Mott, under whose able supervision their Western trade has steadily expanded. They do no contract work whatever, but furnish office room to John J. Shear and John M. Hansen, engineers and contractors for hot water and steam heating, and to Harcourt Mott, who installs warm air furnaces.

THE PENINSULAR STOVE COMPANY of Detroit and Chicago are showing remarkable enterprise for the times. In the first place, they are bringing out a new full line of steel ranges. They have done so well in this branch of trade that their success has stimulated them to greater exertions. Theirsteel range plant has been so thoroughly equipped that the claim is now made that it is among the foremost in the country. The company are also bringing out a four-hole medium priced wood range, to be named Bronze Peninsular; a six hole medium priced wood range, to be named Silver Peninsular; a complete line of six-hole first-class coal ranges, to be named Domestic Peninsular; a line of four-hole medium priced coal ranges, to be named Onyx Peninsular and a line of six-hole medium priced coal ranges, to be named Granite Peninsular. Some addition is also to be made to the line of Welcome Peninsular wood cooks. Manager Edward C. Hanrahan of the Chicago branch, at 79 Wabash avenue, expresses much confidence that the company's enterprise will be appreciated by the trade.

THE J. L. MOTT IRON WORKS, Beekman and Cliff streets, New York, are putting on the market a new range in one size, 7-inch, which is called the Claremont. It is made with right or left oven 11 x 16 x 17 inches in size and is furnished with low closet and water back. The top is of the French style and the range presents several interesting constructive features.

ALBERT N. PARLIN, treasurer of the Magee Furnace Company, visited John M. Sweeny at the New York house at 242 Water street last Tuesday previous to sailing on the "Fuerst Bismarck" for a visit to the Mediterranean and the Orient. He will stop at some of the large European cities on his return, reaching home in April.

THE THATCHER FURNACE COMPANY, 240 Water street, New York, are run-

ning their foundry on full time on the Thatcher furnaces and ranges and Champion steam and hot water heaters. They have recently completed a new cupola of double the capacity of the one formerly used. The cupola is located in a new brick building that is provided with a steam elevator for lifting the coal and iron. The company state that their goods have given general satisfaction and their trade is increasing.

AN UNINTENTIONAL ERROR was made last week in stating that the Cole Mfg. Company had incorporated at Omaha, Neb. This is not the case, The Cole Mfg. Company are incorporated, with a capital stock of $100,000, in the city of Council Bluffs, Iowa, under the laws of the State of Iowa and not Nebraska, and they are doing business in the city of Council Bluffs, Iowa, manufacturing Cole's air tight wood heater and tank heater, and jobbing bicycles and stoves.

THE PERRY STOVE COMPANY, 242 Water street, New York, are showing a line of Argand high junior gasoline stoves. One of the features is a step burner that may be folded against the frame when not in use.

The Western Stove & Mfg. Company,

60 to 70 Third street, Milwaukee, Wis., report an excellent start in trade for a new company, having sold a large number of stoves for delivery the coming season. They have a well equipped factory, in which they have placed the most approved machinery under the direction of experts in this line. Special care is taken in the construction of stove parts. The needle valves are made with great exactness, and all burners are bored from the solid instead of being cored castings, thus avoiding the possibility of sand holes. All parts of the frames, including tops and bottoms, are made in this factory. The frames are made exceptionally strong, while the tops are considerably wider than usual, so as to provide plenty of room to hold cooking utensils. The mounting and finishing shop occupies a separate story of the building. Here all stoves are tested for an hour before being sent out or stored. The same method is pursued even with the cheapest grades. The company make a special cap for their burner which intensifies the flame, as shown by tests made with this and ordinary burners. The output of the works is gradually increasing, and in a short time the company hope to be turning out 200 stoves daily. They have recently appointed Reeves & Smiley, 44 North Fourth street, Philadelphia, their sales agents for Western Pennsylvania, Western and Southern New Jersey, Delaware and Maryland.

The British *Naval and Military Record* reports that as a result of a series of experiments recently carried out by the Ordnance Committee at Portsmouth, the Admiralty have decided to introduce into the British navy a new type of shell for use with all breech loading guns, from the 16½-inch 110-ton down to the 6-inch 5-ton gun, and also for the 6-inch quick firing gun. The new projectile will be made of cast steel and will have a pointed head. Hitherto the bursting charge of the common shell used for all the larger types of breech loading and quick firing guns has received its detonation by means of a fuse fitted into the head of the projectile. This arrangement seriously interfered with the penetrative power of the shell, and it is principally for the purpose of giving greater facilities for penetration that the pointed heads are to be adopted. The base of the projectile, which has hitherto been used exclusively for filling with the bursting charge, will now also be arranged for the reception of a fuse. The projectile for the 16.25-inch gun will, when empty, weigh over 1600 pounds, and will be made to receive a bursting charge of about 200 pounds of gunpowder.

Trade Notes.

THE STOWE MFG. COMPANY, Binghamton, N. Y., issue their No. 5 Catalogue of the Stowe Flexible Shaft, of which they are the inventors and manufacturers. The first page of the catalogue proper presents a portrait of N. Stowe, the president of the company. The shaft is illustrated in all its various forms and a description of its advantages is presented. It has a very extensive application, as shown by the illustrations in the catalogue. All the attachments and appliances connected with the shaft are likewise noted.

MCCLURE & Co., 62 Second avenue, Pittsburgh, Pa., in an announcement refer to their guaranteed brands of roofing tin which include McClure's Redipped, McClure's Hand Coated and O B T Extra Coated.

THE KIECKHEFER BROTHERS COMPANY of Milwaukee, Wis., deny the report that they are about to engage in the manufacture of Enameled Ware. It had been stated that they proposed to equip a large factory for this special purpose.

THE JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J., continue their practice of sending out serviceable monthly blotters to the trade. The one for February is appropriately decorated with a medallion of President Washington.

HAMILTON'S BEST REDIPPED AMERICAN ROOFING TIN is the subject of an advertisement elsewhere of John Hamilton, 62–64 Third avenue, Pittsburgh, Pa. The merits of the plate are referred to in the announcement.

Crop figures for last year, published by the Government, indicate that, as compared with 1893, there was an increase of 64,000,000 bushels of wheat and 23,000,000 bushels of oats, but a decrease of 400,000,000 bushels of corn. The latter crop was the lowest recorded for many years. The farm value of the nine most important crops, exclusive of cotton, is broadly estimated at $1,621,000,000, the figures, as compared with earlier years, being given as follows:

Crops.	1894.	1890.	1880.
Corn	$554,700,000	$754,400,000	$699,700,000
Hay	458,500,000	408,400,000	371,800,000
Wheat	225,900,000	334,700,000	474,200,000
Oats	214,860,000	222,000,000	150,200,000
Potatoes	91,500,000	81,400,000	81,000,000
Tobacco	27,700,000	43,600,000	43,300,000
Barley	27,100,000	37,600,000	30,000,000
Rye	13,300,000	16,700,000	18,500,000
Buckwheat	7,000,000	7,600,000	8,600,000

President Ingalls of the Chesapeake & Ohio Railroad announces that after April 1 next that road will relinquish the coal agency business which it has maintained for many years. This decision has given much satisfaction to the Virginia coal operators.

CONTENTS.

	PAGE.
Editorials:	
Building Trades Exhibition	33
Overcrowded New York	33
Health and Morals	33
Bids on Heating	33
The Letter Box—	
Squaring the Circle	34
A Cold Air Duct. Illustrated.	34
Heating from Stove Coil	34
Purifying Cistern Water	35
How to Make Gold Plentiful	35
Pressure and Circulation. Illustrated.	35
Insurance Rates on Gasoline Stoves	35
Question of Gas Pressure	35
Furnace Pipe Rule	35
Steam and Hot Water—	
The Tabasco Water Heater. Illus.	36
Heating and Drying by the Use of Exhaust Steam and Live Steam Reduced to Low Pressure, Either Separately or in Combination	36
The Onderdonk Combination Steam Trap. Illustrated	37
The Literature of Heating and Ventilating	37
Heating and Ventilation of School Buildings	39
The Mason Receiver. Illustrated.	40
After the Convention	41
Heating Notes	41
Electric Fans for Heating Purposes	41
Iowa Steam Fitters	41
Good Advice	41
Roofing and Cornice—	
Conductor Heads.—II. Illustrated.	42
Flashings	43
The Baird Tilting Tumbling Barrel. Ill.	43
Plumbing and Gas Fitting—	
Pennsylvania Plumbing Law	44
House Drainage Inspector	44
A Handy Pipe Holder. Illustrated	44
Traps and Vents	44
Standing Committees of New York Plumbers	46
New Publications	46
Canners' and Tinners' Furnace. Illus.	46
News and Notes	46
Tin Plates—	
A Tin Plate Suggestion	47
A Correction	47
Scrap	47
Labor and Public Carriers	48
Building Operations in 1894	48
The Retail Store—	
Combined Scoop and Scale. Illus.	49
Tubular Steel Wheelbarrows. Illus.	49
Memoranda	
New Favorite Postal Balance. Illus.	50
New Can Openers. Illustrated	50
Heating and Plumbing—New Work and Contracts	51
Stove Trade Notes—	
Cupola Tuyeres.—IV. Illustrated	52
The A. J. Lindemann & Hoverson Company	52
The Clark Stove Company	53
Odd Plates	53
The Western Stove & Mfg. Company	55
Trade Notes	55
Trade Report—	
The Iron Market	56
Metal Market	56
Chicago Report	57
Condition of the Hardware Trade	57
Notes on Prices	57
Wallace & Sons' 1895 Catalogue	58
Metal and Miscellaneous Prices	59
Labor Exchange—	
Help Wanted	61
Situations Wanted	61

TRADE REPORT.

The Iron Market.

Pig Iron.—There has been no important improvement during the week in the New York market. Special Bessemer is offering at low figures from the West, $14 @ $14.50 being named, according to place of delivery. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

Philadelphia advices indicate that the condition of the market in that district is little changed. At the reduced prices the market is steady, and, while the demand is not large, furnaces appear to keep pretty clear from accumulations. Consumers are stolidly indifferent, however, and take nothing but what they just happen to want, no matter how low the price may be. Sellers understand the situation, and are, therefore, not forcing the market, seeing that it would not increase the volume of business, although it might affect prices, which as a matter of fact are as low as they can be made without going under actual cost. The following quotations fairly represent the market for Philadelphia deliveries, Harrisburg, York and Baltimore being 20¢ to 30¢ less, according to proximity of furnace:

Standard No. 1 Foundry X	$12.00 to $12.50
Standard No. 2 Foundry X	11.00 to 11.50
No. 2 Plain	10.75 to 11.00
No. 1 Soft	11.50 to 11.75
No. 2 Soft	10.75 to 11.00

The most important feature of the Chicago Pig Iron market has been the steady increase in shipments of local Iron. Foundries are resuming work very generally and are ordering their Iron to be more promptly shipped on contracts closed some time since. The movement is heavy and fully up to that of 18 months back. New business, however, is disappointingly slow; buyers make inquiries and then postpone purchases. A tendency is developing to stiffen prices of Southern Iron on account of the restricted number of concerns now producing. Lake Superior Charcoal is still quiet. Quotations are as follows, for cash:

Lake Superior Charcoal	$13.00 to $14.00
Local Coke Foundry, No. 1	10.25 to 10.50
Local Coke Foundry, No. 2	9.75 to 10.00
Local Coke Foundry, No. 3	9.50 to 9.75
Local Scotch	10.50 to 11.00
Ohio Strong Softeners, No. 1	12.50 to 13.00
Southern Silvery, No. 1	11.50 to 11.75
Southern Silvery, No. 2	11.25 to 11.50
Southern Coke, No. 2	10.00 to 10.50
Southern Coke, No. 3	9.75 to 10.25
Southern, No. 1, Soft	10.25 to 10.50
Southern, No. 2, Soft	9.75 to 10.25
Alabama Car Wheel	17.50 to 18.00
Jackson County Silvery	15.50 to 16.00
Other Ohio Silvery	14.25 to 14.50

Foundry Iron in the Pittsburgh district has not shown any improvement during the week, either in demand or prices, and No. 2 Foundry has sold at the lowest prices ever known. Quotations are given as follows, for cash:

No. 1 Foundry	$10.50 to $10.65
No. 2 Foundry	9.75 to 10.00

Our Cincinnati representative reports that in that market there have been several large sales of 2000 and 3000 ton lots, as well as several sales of 500 to 1000 tons, and, too, there have been a number of small orders aggregating quite a considerable amount. Deliveries extend from one to four months, but one particularly noticeable feature is that the demand is mainly for prompt or early delivery. From a review of the situation it is evident that buyers are purchasing only for current wants. There is no disposition to speculate even to the extent of anticipating probable needs. On the whole melters of Iron seem to be carrying very light stock. Stove foundries, Pipe works, rolling mills and general foundries have figured in the ranks of buyers. The number of small orders received seem to indicate more general animation, although there are other features to discourage this belief. At the moment buyers seem to be having the best of the market, but the market is so sensitive that any concerted or prolonged buying movement would cause quick response and a stronger feeling, if not higher prices. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.00 to 9.25
Southern Coke, No. 3	8.50 to 8.75
Ohio Soft Stone Coal, No. 1	14.50 to 15.00
Ohio Soft Stone Coal, No. 2	14.00 to 14.50
Lake Superior Coke, No. 1	11.75 to 12.25
Lake Superior Coke, No. 2	10.75 to 11.50
Hanging Rock Charcoal, No. 1	16.00 to 16.50
Hanging Rock Charcoal, No. 2	15.50 to 16.00
Tennessee Charcoal, No. 1	13.00 to 13.50
Tennessee Charcoal, No. 2	12.00 to 12.50
Bessemer	11.65 to 12.00
Standard Southern Car Wheel	15.75 to 16.75
Lake Superior Car Wheel and Malleable	14.25 to 14.75

The Pig Iron market in St. Louis is characterized by extreme dullness. Occasionally an order is secured but in most cases the amounts do not average much over 100 to 200 ton lots, for immediate shipment. Prices are firm and are being maintained, as the past month has demonstrated very effectually that sales cannot be increased by shading prices. Nearly all the heavy local consumers of Pig Iron are now running full time and it is expected that they will shortly be in the market, as none of them are carrying very large stocks. No. 2 Foundry continues to be firmly held on the basis of $7, f.o.b. cars Birmingham. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.25 to $10.50
Southern Coke, No. 2 Foundry	9.75 to 10.00
Southern Coke, No. 3 Foundry	9.25 to 9.50
Southern Car Wheel	16.25 to 16.75

H. O. Canfield, Bridgeport, Conn., issues a catalogue relating to Mechanical Rubber Goods. A specialty is made of Plumbers' Rubber Supplies, and illustrations are given in the catalogue of Basin and Bathtub Plugs, Bibb Washers, Bumpers or Fender Tips, Floor Plate Flange Rings, Glass Gauge and Plunger Rings, Basin and Tub Waste Washers, Solid Valve Disks, Beer Pump Rubber Supplies, Car and Carriage Springs. Pump and Ball Cock Valves, Rubber Pipe Unions, &c. The manufacturer refers to the catalogue as much more complete than any he has heretofore issued.

Metal Market.

Pig Tin.—The lively skirmishing to secure Tin for January delivery, which marked the close of last week and forced the wholesale price up up 15¢, came to an end at the beginning of the present week. With the closing out of the January deal the market gradually assumed more normal shape, as far at least as the relative prices are concerned. The sharp fluctuations that have taken place during the past 30 days, chiefly through purely speculative contest, leave sentiment feverish in the extreme. Operations are, therefore, conducted with caution, since it remains to be seen which of the contending factions will come out best in the long run. The movement of wholesale prices this week has again been downward, and the market closes in an unsettled condition. Jobbing business has been moderate and prices during the week irregular. Quotations for small lots at the close, however, ruling at about the same figures as were given last week, namely, 15¢ ℔ lb.

Copper.—The market is wholly unchanged. Merely routine business has been done, the volume of which does not appear to have been more than fair, and neither export nor home trade demand has exceeded commonplace proportions. Still no considerable amount of copper comes out from any quarter, and prices for all descriptions are kept remarkably steady. It is claimed that deliveries the past month have been on a level with the output of the mines, and that the market has substantial basis of strength on the statistical position alone. So far as the retail trade is concerned, consumers are still inclined to adhere to a conservative policy in buying. Small lots of Lake Ingot from store are quoted at 10½¢ ℔ lb.

Sheet Copper.—The demand is only moderate and inquiry hardly up to the average of last week. Small jobbing quantities are sold on a basis of 15¢ ℔ lb, net, with a reduction in the case of larger lots, or where special inducements prevail.

Pig Lead.—Compared with that of a week ago the present condition of the market shows hardly any change. Sellers are not offering with greater freedom nor yielding anything on prices. Buyers adhere to a very conservative policy, purchasing only as well defined wants may dictate. The market generally is quiet, but steady, small lots of American Pig ruling at 3½¢ @ 3⅝¢ ℔ lb.

Lead Pipe and Sheet.—Dealers report a narrow demand, governed almost exclusively by actual present needs. There seems hardly the least disposition to anticipate wants, and these are very moderate at the present time, owing to the prevailing slackness in the building trades. Prices are moderately firm, according to list, in this section.

Spelter.—There has been no improvement in business or in the demand, but offerings have become more urgent, causing prices to soften. Good brands

of Western may be secured in small lots at 4¢ @ 4¼¢ ℔ lb.

Antimony.—The market is steady, with a moderate demand. Prices unchanged from last week's quotations.

Nickel.—Quotations remain at about 36¢ @ 42¢, according to quantity of metal involved.

Tin Plates.—In Coke Plates for forward shipment quite a good business has been done during the earlier part of the week, but the buying interest has moderated and the market has relapsed into a condition of extreme dullness, notwithstanding the fact that prices have been marked down to the lowest known. Spot business haa been irregular, and in the aggregate smaller than that of last week. Nothing indicates any immediate improvement in this respect, consumers appearing determined to maintain their hand to-mouth policy in buying, uninfluenced to any appreciable extent by the inducements offered by low prices, Some sales are reported as having been made during the week at exceptionally low prices. A quantity of stock that has been warehoused since before the imposition of the McKinley tariff has recently been auctioned in New York and Philadelphia, fetching phenomenally low prices —in some instances from 50 to 60 % below the market value of the Plates at the time they were imported, although they are said to be in excellent condition. The closing down of a number of Welsh works has been followed by the starting up of several large domestic plants under the new compromise wage scale, so that no scarcity of Plates is apprehended.

The following London cable dispatch of January 30 to *The Iron Age* describes the British Tin Plate Market:

The Tin Plate market has been slow and prices are still easier. Business limited mostly to very small lots, some of which were at below previous bottom rates. Quotations f.o.b. Wales are given as follows:

Bessemer Cokes, IC 14 x 20	....	@	9/3
Siemens Cokes, IC 14 x 20	....	@	9/6
Ternes, 20 x 28	18/	@	23/
Charcoals, IC 14 x 20	10/6	@	13/

Sheet Iron.—Manufacturers' agents report a very fair business, sufficient to keep the mills supplying this section actively employed. An increasing disposition is noted among consumers to anticipate their requirements, and some good sized orders are being placed for future deliveries. The demand for Black Plates for tinning purposes is referred to as excellent, due to the starting up again of a number of Tin Plate worka who buy their plates. Galvanized Sheets are rather quieter. Jobbers' quotations for small lots of No. 27 Common Iron from store are about 2.65¢; and Galvanized rules at 75 and 5 % @ 75 and 10 % off.

THE ELECTRIC HEAT ALARM COMPANY, 145 High street, Boston, Mass., issue what they entitle their descriptive Catalogue No. 4 of Automatic Fire Alarms, Automatic Journal Bearing Alarms, Hotel Call and Fire Alarm System, Automatic Alarms for Grain Elevators, Coal Bunkers, Warehouses, &c. The catalogue is a neat pamphlet of some 50 pages, bound in red cloth, and gives a full description with illustrations of the various alarms alluded to. With the increasing use of electricity for the purposes indicated alarms of all sorts are becoming generally introduced, and the instruction and diagrams given in this pamphlet will be appreciated by all who have to do such work. At the end of the catalogue are a number of testimonial letters from those who are using the alarms and are willing to speak of their merits.

Chicago Report.

Scrap.—Cheap scrap is moving quite freely, but high grade scrap is very dull. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per ℔
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	...	2¼¢
Rubber	..	4 ¢

Anthracite.— The very cold weather has not increased the demand. The market is also affected by the extremely low price of Soft Coal, which is selling at $2 per ton retail, owing to a railroad fight. Carload lots of 12 net tons or over are quoted as follows:

	Egg, Grate.	Sto. and Ch.
Chicago, Ill	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8.10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE LATEST CIRCULAR sent out by Frank I. Maule, 328 Chestnut street, Philadelphia, Pa., is one of those curious publications that cannot fail to receive attention. It is a mixture of various colors and various sentiments put together in various ways, and altogether is a striking example of clever advertising. Mr. Maule makes a specialty of preparing commercial literature, as he terms it, which includes advertisements, catalogues, &c., *ad infinitum*.

DANIEL W. RICHARDS and Morton B. Smith, composing the firm of Daniel W. Richards & Co., dealers in Scrap Iron, have dissolved partnership by mutual consent. Mr. Smith has purchased the stock of the late firm and will continue the business at the same offices in the Manhattan Life Building, 64-68 Broadway, New York.

CONDITION OF THE

Hardware Trade.

THERE is a perceptible increase in the volume of business, but the demand is not as yet as regular and steady as might be desirable, a very good mail one day being followed by comparatively light orders the next. It is, however, an encouraging feature that the salesmen who are on the road generally send in hopeful reports. There is also an evident improvement in some lines, as, for example, Wire Nails, which are unquestionably in a better condition than for some time, with a vigorous demand, which tends to give tone to the market. Manufacturers are maintaining prices pretty well, considering the constant effort which is being made to induce lower quotations. There are, of course, many lines in which concessions are still being made, but on the whole manufacturers are indisposed to yield to the pressure, especially as prices are in some instances so demoralized as to approach closely to the cost line. Under the present circumstances it is to be hoped that manufacturers will refrain from unnecessarily slaughtering prices and do what they can to give steadiness and tone to the market.

Advices from Chicago. — January closes with the Shelf Hardware trade less active than when business opened in the early part of the month, yet its condition is regarded as fair, and the volume is certainly greater than that of the corresponding period of 1894. Considerable business is being done in spring goods, such as Wire Screens, Screen Doors, Poultry Netting, Refrigerators and kindred articles, but Builders' Hardware is moving slowly and Shelf goods are only being called for to sort up. Tinware, however, is in excellent demand and orders for this class of merchandise are as large as they have been at any time in the past. Prices continue low on Tinware, and as yet there is little indication of the advance which has for some time been expected. Staple goods are moving in only moderate volume, the extremely low prices now quoted having resulted in stimulating trade very slightly, if at all. Heavy Hardware is in satisfactory shape, the volume of business in January having been considerably larger than that of January last year. The volume is stated by some jobbers to be even larger in dollars and cents, which shows a decided improvement in trade, as prices now are at least 25 per cent. below those of January, 1894. The continued cold weather and abundance of snow have been of much benefit to jobbers by greatly increasing the demand for sleds, supplies and other articles going with them. The season in this respect has been the best for several years.

Notes on Prices.

Wire Nails.—Since our last report there has been a marked improvement in the tone of the Wire Nail market and prices are quotably higher. The improved tone was perceptible first in the West, manufacturers withdrawing the extreme prices which had been current and insisting on somewhat higher figures. Concurrently with this disposition on their part orders began to come in from the trade, a fact which had the effect naturally of giving the market a still better

tone and leading to the naming of slightly higher prices. The market in the East has already sympathized with the condition referred to and all the manufacturers are now naming higher prices than a week ago. The volume of business has been very large and most of the mills are full of orders for some time to come.

Advices from Chicago. — Manufacturers are making very heavy shipments. Authentic information from all the largest concerns selling in this market discloses the fact that the movement now is one of the greatest in the history of the trade. Running far beyond the current output and rapidly depleting stocks, they have been able without concert of action to advance their price until now the bottom price to the largest buyers is $1, Chicago or Joliet. The advance made by the manufacturers has so far had no effect on the jobbers, who continue to sell at the same low rates which have prevailed here for the past two weeks. They quote carload lots at 95 cents to $1, f.o.b. cars Joliet, or $1 to $1.10 for shipments from stock in Chicago.

Cut Nails.—The Cut Nail market has not in any marked degree shown sympathy with the improved condition in Wire Nails, quotations being substantially as last week. The volume of business has been moderate, though some improvement is reported, and there is perhaps a slightly better tone to the market.

Advices from Chicago.—Manufacturers report a fair trade in Cut Nails, but the local mill has not yet resumed operations. Quotations are unchanged. Jobbers quote small lots from stock at $1.

Barb Wire.—There are some indications of a slightly better feeling in Barb Wire, though quotations remain substantially as for the past few weeks. Small lots from store in New York are held at $2.15 to $2.20.

Advices from Chicago.—A very large trade is in progress; shipments from factory are heavy, manufacturers find that they made an error in not accumulating larger stocks during the dull season, as the trade would easily have absorbed much more Wire than is now available. Jobbers' quotations are still as low as those of manufacturers, being only $1.55 to $1.60, f.o.b. cars Joliet, for carloads of painted, and $1.90 to $1.95 for galvanized, or $1.70 and $2.05, respectively, for small lots to be shipped from stock in Chicago.

Eclipse Lawn Sprinklers.—In *The Metal Worker*, January 26, we described the Eclipse Lawn Sprinkler, put on the market by the Crescent Brass & Iron Works, Detroit, Mich. These goods are sold to the trade at the following net prices.

	Per dozen.
Eclipse Lawn Sprinkler	1.50

Binder Twine.—The Binder Twine market shows a somewhat firmer tone, with a moderate amount of business. Prices remain about the same as last reported. The Western Twine Company are making an effort to dispose of the large amount of Binder Twine which has been held by the bankers as collateral, and this Twine proves a somewhat disturbing element in the market. Some buyers consider this held over Twine inferior for use to new made Twine, yet the price at which it is offered affects the price of new Twine. The condition in which the wheat crop is found to be when the snow goes off will naturally affect the prospective demand for and prices of Binder Twine. The market is represented by the following quotations in 50-ton lots, the same prices in some instances being made for Twine in carload lots:

	Per pound.
Sisal	$0.05
Standard	.05
Manila	.06
Pure Manila	.07¼

Wrought Iron Pipe —In view of the irregular and somewhat demoralized condition which has characterized the Wrought Iron Pipe market for some time, the action of the manufacturers at their meeting held in Pittsburgh January 30, is of more than usual interest and importance. Information in regard to the action taken is given in another column.

Expanded Metal Lath. — J. K. Combs, 107 Chambers street, New York, manager of the Central Expanded Metal Company (Chess, Cook & Co.), Pittsburgh, Pa., announces the following new prices on expanded metal lath. Style A lath, 23 cents per square yard: Style B lath, 19 cents per square yard; Style C lath, 23 cents per square yard; For small lots a charge for cartage will be made in New York City. In lots of 1000 yards no charge for cartage this side of Fifty-sixth street, N. Y. Above Fifty-sixth street a small charge is made for men's time.

Glass.—The present outlook for the Glass trade is not particularly encouraging. Both manufacturers and jobbers decry the low prices at which Glass is being sold, but with the limited demand at the present time there seems to be no reason for any immediate advance. It is understood that jobbers will have abundant stocks of Glass on hand when the spring opens, which have been bought at low figures, and it appears that they will control prices. Manufacturers have probably made the Glass to fill the orders placed by jobbers, and what is now made will be piled up at factory. Although Glass manufacturers have had conferences looking to some united action for improving the condition of the market, no solution of the question has yet been reached The New York market is represented by the following quotations: For small lots of Double or Single Strength Glass in store, 85 and 10 per cent. discount; in car lots from factory, 88 per cent. discount for Single and 90 and 5 per cent. discount for Double Strength Glass.

Old Rags, Paper, &c.—Demand is fair and dealers' purchasing prices substantially the same as those quoted last week, namely:

No. 1 White Rags	℔	lb	3 @	3¼¢
No. 2 White Rags	℔	lb	2¼ @	2½¢
Mixed Rags	℔	lb	¾ @	1 ¢
Blues and 3ds	℔	lb	1⅛ @	1⅜¢
Hard Sized White Shavings	℔	lb	2⅛ @	2¼¢
No. 1 White Book Shavings	℔	lb	1¾ @	2⅛¢
No. 2 White Book Shavings	℔	lb	1 @	1⅛¢
Light Book Shavings	℔	lb		⅝¢
No. 1 Mixed Shavings	℔	lb	⅞ @	1 ¢
No. 2 Mixed Shavings	℔	lb	⅝ @	¾¢
No. 1 Printed Books	℔	lb	1 @	1¼¢
Ordinary Mixed Books	℔	lb	½ @	¾¢
Newspapers	℔	lb		2-5¢
No. 1 Manila Paper	℔	lb	¾ @	1 ¢
No 2 Manila Paper	℔	lb	⅝ @	¾¢
Bogus Paper	℔	lb		½¢
Common Paper	℔	lb	¼ @	3-5¢
Straw Chips	℔	lb		⅜¢
Binders' Clippings	℔	lb		⅛¢
Jute Butts	℔	lb	1½ @	1¾¢
No. 1 Jute Bagging	℔	lb	1 @	1¼¢
Mixed Bagging	℔	lb	¾ @	1 ¢
No. 2 Bagging	℔	lb	½ @	¾¢
Hemp Twine	℔	lb	2 @	2¼¢
Manila Rope	℔	lb	2 @	2⅛¢
Jute Rope	℔	lb	1½ @	1¾¢
Mixed Rope	℔	lb	¾ @	⅞¢

Old Metals.—Business is somewhat dull, the demand having fallen off perceptibly. Prices show no quotable change. The following quotations represent the current rates paid by dealers in this city:

Heavy Copper	℔	lb	7 ¢
Light and Tinned Copper	℔	lb	6½¢
Heavy Brass	℔	lb	4¾¢
Light Brass	℔	lb	3¾¢
Lead	℔	lb	2¼¢
Tea Lead	℔	lb	2½¢
Zinc	℔	lb	2⅛¢
No. 1 Pewter	℔	lb	10 ¢
No. 2 Pewter	℔	lb	5½¢
Wrought Scrap Iron, ℔ gross ton			$7.50 @ $8.00
Heavy Cast Scrap ℔ gross ton			7.50 @ 8.50
Stove Plate Scrap	℔	gross ton	5.00
Burnt Iron	℔	gross ton	3.00

Old Rubber.—The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots	℔	lb.	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory	℔	lb.	@ .05¼
Rubber Shoes, less than carloads	℔	lb.	@ .04¾
White Wringer Rolls	℔	lb.	@ .03⅞
White Syringes	℔	lb.	@ .03⅞

Wallace & Sons' 1895 Catalogue.

We are advised that the old established house of Wallace & Sons, Brass and Copper Rolling Mills, with sample rooms and warehouses at 29 Chambers street, New York, and mills at Ansonia, Conn., are about to issue a new illustrated catalogue. There is little doubt that it will illustrate the progressive position this house have for nearly half a century maintained in the Brass and Copper trade. From a cursory examination of the proof sheets kindly shown our representative, we judge the book will be a very acceptable addition to the catalogue libraries of metal workers, hardware merchants, &c., and will, on account of its complete price-lists of different articles, as well as its tables of measurements, weights, &c., become a standard book of reference for dealers in their line.

We notice that special attention has been given to details, particularly in revising various price lists hitherto more or less confusing, and these changes, together with the profuse illustrations of the various articles they manufacture, make everything quite clear, even to those who may not be thoroughly familiar with the business. The book is also illustrated with cuts showing the improved manner of packing various articles for the convenience and utility of the Shelf Hardware trade, such as Star Brand Copper Rivets and Burrs, Copper Tacks and Nails, Spelter, Solder, &c.

Care has also been taken in specifying the stock sizes of the different goods they carry to enable customers who are in urgent need to be able to see at a glance what they can order, with the assurance of receiving prompt shipment.

Several pages in the back of the catalogue are devoted to tables of weights, measurements, &c., of different Metals, such as Sheet Copper, Seamless Brass and Copper Tubing, Brass and Copper Rod, &c., so as to enable the trade to estimate on goods of this description comprehensively.

THE YARNELL TIN & HARDWARE COMPANY, Somerset, Ohio, have been formed with a capital of $15,000.

Metal and Miscellaneous Prices.

CHICAGO, JANUARY 31, 1895

Tin—

Straits pigs.....16¼¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX, 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 25.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade.	IC, 10 x 14	@ 5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—	IC. 10x14.14x20.	$4.75 @ 5.00
	IC, 14x20. 90 ℔	4.25 @ 4.50
	IC, 14x20. 100 ℔	4.50 @ 4.75
	10 x 20	@ 7.25
	20 x 28	@10.00
	IX, 10x14, 14 x20	@ 6.25
B.V. Grade.	IC,10x14, 14x20	@ ....

Charcoal Plates.—Terne.

Guaranteed Plates command specia prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@$5.00
20 x 28	$9.50@10.00
IX. 20 x 28	12.00@12.50
Worcester Brand and equal.—	
IC. 14 x 20	@ 5.25
IC, 20 x 28	10.00 @10.50
IX, 14 x 20	6.25 @ 6.50
20 x 28	12.50 @13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
	Per box of 56 sheets	
X, 14 x 56		$12.50
XX, 14 x 56	$29.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.37½
IX, 10 x 14, 12 x 12, 14 x 20. 6.62½

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.62½
IX, 10 x 14, 12 x 12, 14 x 20. 7.12½

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.12½
IX, 10 x 14, 12 x 12. 14 x 20.. 7.62½

Usual extras or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20 $5.75
IX, full weight, 14 x 20 7.50

Irondale A A:

IC, full weight, 14 x 20 5.25
IX, full weight, 14 x 20 6.75

Irondale A:

IC, full weight, 14 x 20 5.00

Irondale B:

IC, 100 lbs., 14 x 20 4.75
IC, full weight, 14 x 20 4.85

Irondale C, IC, 14 x 20, 100 lbs. 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates.—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $5.00
Old Hundred, IC, 14 x 20, 100 lbs. 4.75
R. W. & B., IC, 20 x 28, 216 lbs. 10 00
Old Hundred, IC, 20 x 28, 200 lbs. 9.50

Roofing Plates.

Palm, IC, 20 x 28 @$10.00
Palm, IX, 20 x 28 @ 12.00
Empire, IC, 20 x 28 @ 10.75
Empire, IX, 20 x 28 @ ....
Hickory, IC, 20 x 28 @ 11.50
" IX, 20 x 28 @ 14.00
Alaska (heavily coated), IC, 20x28 @ 13.50
Alaska IX, 20 x 28 @ 16.50
Special, IC, 20 x 28 @ 13.50
" IX, 20 x 28 @ 16.50
Niagara, IC, 20 x 28 9.50
Iroquois, IC, 20 x 28 9.00

Westmoreland:

IC, 14 x 20 5.25
IC, 20 x 28 10.50

Kenwood:

IC, 20 x 28 10.00

Furmston:

IC, 14 x 20 4.75
IC, 20 x 28 9.50

Irondale AA, IC, 14 x 20 ....
Irondale A, IC, 20 x 28 10.50
Irondale B, IC, 20 x 28 10.10
Each extra cross $1.50.

Challenge, IC, 20 x 28 10.50

Juno:

IC, 14 x 20 ....
IC, 20 x 28 ....

Illinois, Old Method:

IC, 20 x 28 13.50
IX, 20 x 28 16.50

E. L.:

IC, 20 x 28 10.75
IX, 20 x 28 13.25

Jessie:

IC, 20 x 28 10.25

Old Process:

IC, 14 x 20 3.00
IX, 14 x 20 9.50
IC, 20 x 28 16.00
IX, 20 x 28 19.00

H. B. L., Old Style:

IC, 14 x 20 7.00
IX, 14 x 20 8.25
IC, 20 x 28 14.00
IX, 20 x 28 16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.65

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ ℔ 2 1-10¢	2 8-10¢
17 to 20	₩ ℔ 2 2-10¢	2 9-10¢
21 to 24	₩ ℔ 2 3-10¢	3 ¢
25 and 26	₩ ℔ 2 4-10¢	3 1-10¢
27	₩ ℔ 2 5-10¢	3 2-10¢

Russia, Planished, &c.

	100 lbs.
Patent Planished, ₩ ℔, A	$10.20 less 10%
Patent Planished, ₩ ℔, B	9.20 less dis
Craig's Polished Sheet Steel	8¼¢

Galvanized.

Juniata, or first quality.....dis. 75&10%

Copper—

Ingot.

Lake.....11 ¢ @ 11¼¢
Casting Brands.....10 ¢ @ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)

(To No. 19 inclusive.)

Disconnt, 40%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .48
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 ℔ casks.....$4.75
300 ℔ casks.....4.95
Loose sheets.....5.05

Solder—

½&½.....9¼@10¢
Extra Wiping.....8½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9½¢

Lead—

Soft Pig Lead.....3½¢
Bar.....4¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe—

1¼ and under, Plain.....57½&10&10%
1¼ and under, Galv.....50&10&10%
1½ and over, Plain.....67½&10&10%
1½ and over, Galv.....57½%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd.....65%
Ritchie's Spiral Lock Seam, Galv'd...60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....65%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....₩ ℔, 2 ¢
" " Brown.....₩ ℔, 1½¢
" " Purple.....₩ ℔, 2½¢
" Ground in oil, B. Red ₩ ℔, 6½¢
" Ground in oil, Red.. ₩ ℔, 6½¢
" Ground in oil, Brown ₩ ℔, 5½¢
" Gronnd in oil, Purple ₩ ℔, 6 ¢
Linseed Oil, Boiled, in bbls.....60¢
Linseed Oil, Raw, in bbls.....58¢
Mineral Paints.....2@4¢
Orange Mineral.....8¢
Pure White Lead in Oil.....5¼@5½¢
Dry White Lead in bbls.....4½@5¼¢
Red Lead, American.....5¼@5½¢
Red Venetian, English, dry.....1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢
kegs.....7½¢
Sipe's Japan Oil, in bbls. ₩ gal.....34¢
Spirits Turpentine, in bbls.. ₩ gal. 35½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 ℔.....$1.50
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.15
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.50
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, FEBRUARY 1, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots.....₩ ℔, 63¢
100-℔ lots.....₩ ℔, 60¢
Ton lots.....₩ ℔, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ ℔, 60¢
100-℔ lots.....₩ ℔, 55¢
Ton lots.....₩ ℔, 53¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ ℔, 55¢
100-℔ lots.....₩ ℔, 53¢
Ton lots.....₩ ℔, 50¢

Antimony—

Cookson.....₩ ℔, 9¼@9½¢
Hallett's.....₩ ℔, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.	
¼-in. np to 2-in	$0.35	25 @ 30%
5-16-in. up to ¾-in	.86	
⅜-in. up to ¾-in	.88	
⅜-in. up to ½-in	.41	
5-16-in. up to ⅜ in	.48	
¼-in. up to 5-16-in	.65	
3-16-in. up to ¼-in	1.00	
⅛-in. up to 3-16-in	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 19, inclusive,	.38	

Copper and Bronze Tubing—

3¢ ₩ ℔ more than brass.

Conductors—

Corrugated. *Round or Square.*

Galvanized.....60&10%
Galvanized, Locked Joints.....60&10%
Tin.....60&10%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₩ ℔, net

Ingot.

Lake.....10½¢
Ansonia Grade Arisona.....10½¢
Ansonia Grade Casting.....9½¢
Planished.....net
Sheet and Bolt.....15¢ ₩ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:
Lap or Slip Joint, Galvanized.....70&5%
Lap or Slip Joint, Terne.....60&5%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.	
No. 1..	$0.70	.77	.82	.87	1.05	per doz.
No. 2..	.61	.66	.71	.74	....	"

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔ 2.25	2.60¢
Nos. 17 to 21	₩ ℔. 2.35	2.70¢
Nos. 22 to 24	₩ ℔. 2.45	2.80¢
Nos. 25 and 26	₩ ℔. 2.55	2.90¢
No. 27	₩ ℔. 2 65	3.00¢
No. 28	₩ ℔, 2.75	3.10¢
American B. B	₩ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ ℔, 11@11½¢
Patent Planished....₩ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ ℔ 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75&5@75& 10% off.
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3½@3¾¢
Bar.....4@4½¢
Pipe.....5½¢ 20%
Tin Lined Pipe.....12½¢ 20%
Block Tin Pipe.....30¢ 20%
Sheet.....6¼¢, 20%
Old Lead in exchange, 2¾¢ ₩ ℔.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100 @ 500 ℔		5¾
Lead, Amn. White, in oil		@ 5½
Lead, Red, bbls. and ½ bbls		@ 5¾
Lead, Red, kegs		@ 5¾
Ocher, American		@ 1½
Red Venetian, American		@ 1½
Linseed Oil:		
Raw, ₩ gal		@ .56
Boiled		@ .59
Spirits Turpentine:		
In bbls		@ .80
Putty:		
In barrels and ½ bbls	.01½	@ .01¾
In tubs	.01¾	@ .01¾
In tin cans	.01½	@ .02½
In bladders	.01½	@ .02½
Roofing Material, &c.:		
Asphaltum, Trinidad Refined, ₩ ton	$30.00	@$35.00
Asphaltum, Rock, ₩ ton		$14.00
Coal Tar Felt, 1 Ply, ₩ ℔		2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.		$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.		$1.85
Roofing Pitch ₩ bbl		$2.25

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron-Soil—

"Standard" Pipe, 2 to 6 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe, " " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—
Galvanized.....60%
Tin.....60%

Rock and Slag Wool—
	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—
Common and Good—Strained
Rosin, O. & D.....₩ bbl. $1.45@$1.46
Rosin, E. & F.....₩ bbl. $1.50@$1.55
Rosin, G. & H.....₩ bbl. $1.65@$2.00
Rosin, I. & K.....₩ bbl $2.25@$2.45
Rosin, M. & N.....₩ bbl $2.65@$2.85

Seamless Brass Tubes..net
List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—
According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Fen Argyle, ₩ sqr.....3.70@ 4.00
Peach Bottom, ₩ sqr.....4.75@ 5.60
No. 1 Chapman, ₩ sqr.....3.90@ 4.25
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.50@ 2.75
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—
Solder—
½&½, guaranteed.....11¢
No. 1.....9@9½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—
Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....3½¢ } 5 % dis.
½ bbls., about 300 ℔, ₩ ℔.....4¢ } 5 % dis.
Kegs, about 110 ℔, ₩ ℔.....4¢ } 5 % dis.
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢ } 5 % dis.

Yager's Soldering Salts.
½-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—
Western Spelter.....4¢@4¼¢
Bertha (pure).....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—
Galvanized.....60%

Tin, Pigs and Bars—
Banca, pigs, ₩ ℔.....16¢
Straits, pigs, ₩ ℔.....15¢
Straits in bars, ₩ ℔.....16¢

Tin Plates—
American Terne Plates—
Alaska (re-squared) IC, 14 x 20....$6.50
Alderly, extra quality, IC, 14 x 20..5.37½
Allegheny, IC, 14 x 20.....4.50
" IX, 14 x 20.....5 75
Anchor 1C, 14 x 20.....4.12½
Apollo Roofing, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Black Diamond (Extra Coated), IC, 14 x 20.....7.50
Bonus (Extra Coated), IC, 20 x 28..11.50
" " IX, 20 x 28..14.50
Boston, IC, 14 x 20.....6.25
Brooklyn, IC, 14 x 20.....4.50
Capitol, IC, 14 x 20.....4.25
Central, IC, 14 x 20.....4.75
Climax, IC, 14 x 20.....4.37½
Columbia, IC, 14 x 20.....6 25
Columbus, IC, 14 x 20.....4.75
Dunlap's Double Dipped, IC, 14 x 20 7.50
" " " IX, 14 x 20 8.75
" Domestic, IC, 20 x 28.....10.00
Empire, IC, 14 x 20.....5.12½
Eureka, IC, 20 x 28.....9.50
" IX, 20 x 28.....12.00
Eureka, 200 lbs., IC, 20 x 28.....9.20
Excelsior, IC, 14 x 20.....4.75
Filbert, IC, 14 x 20.....7.25
Flag, IC, 14 x 20.....4.00
Florida, IC, 14 x 20.....4.75
Flushing, IC, 14 x 20.....6 25
Freeport (Hand dipped and Resquared). IC, 14 x 20.....6.50
IX, 14 x 20.....7.75
F. R. P., Extra, IC, 20 x 28.....15.00
Globe, IC, 14 x 20.....4.50
Golden Star Old Style, IC, 20 x 28...15.00
" " " IX, 20 x 28...18.00
Grace, IC, 14 x 20.....4.25
Hamilton's Best Redipped, IC, 14x20 7.75
" " " IX, 14x20 9.25
Hickory (Resquared), IC, 14 x 20...5.50
J. L. O., IC, 20 x 28.....9.25
Juniati, IC, 20 x 28.....11.50
Juno, IC, 14 x 20.....5 50
Kensington, IC, 14 x 20.....6.75
" IX, 14 x 20.....8.00
Knoxall, IC, 14 x 20.....4.75
Laufman's Apollo (Resquared), IC, 14 x 20.....6.75
Laufman's Apollo (Resquared), IX, 14 x 20.....8.25
Leominster, Extra Coated, IC, 14x20...5.75
Lion (Stamped), IC, 14 x 20.....5.75
Lulu, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.50
Maple, IC, 14 x 20.....5.75
Merchant's Roofing (Resqnared). IC, 14 x 20.....7.50
Meurer's Old Method, 1C, 14 x 20....7.50
Meurer Roofing, IC, 14 x 20.....7.00
National, IC, 14 x 20.....5.50
Nava, IC, 20 x 28.....10.00
" IX, 20 x 28.....12.50
New Castle Old Method, IC, 20x28, 18.00
New Castle Palm, IC, 20x28.....14.50
Old Colony, IC, 14 x 20.....7.50
Osborn's Old Process, IC, 20 x 28....14.00
" " IX, 20 x 28....17.00
Osceola, Old Style, IC, 14 x 20.....7.25
" " IX, 14 x 20.....8.75
Pennsyl Old Method (Treble Coated), IC, 14 x 20.....7.00
Phillips' Roofing, IC, 14 x 20.....7.00
Phœnix, IC, 14 x 20.....4.62½
Pullman, IC, 14 x 20.....5.75
Republic, IC, 14 x 20.....4.75
Scott's Extra Coated (Resquared), IC, 14 x 20.....8.00
Scott's Extra Coated (Resquared), IX, 14 x 20.....9.50
Standard, IC, 14 x 20.....4.15
Star, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.00
Superior, IC, 14 x 20.....4.50
Taylor's Old Method, IC, 14 x 50....6.50
Taylor Old Style (Resquared), IC, 14 x 20.....7.50
Taylor Roofing, IC, 14 x 20.....6.75
The Osborn Roofing, IC, 20 x 28.....11.50
" " " IX, 20 x 28.....14.00
Thomson's Puritan, IC, 14 x 20.....5.50
Tip Top, IC (Resquared), 14 x 20.....4.88
" IX " 14 x 20.....6.13
Triumph, Old Style, IC, 14 x 20.....7.50
" " IX, 14 x 20.....9.00
U. S. Monongahela, IC, 14 x 20.....6.10
U. S. Redipped, IC, 14 x 20.....8.25
Venus, IC, 14 x 20.....4.12½
Waldo, IC, 14 x 20.....5.75
Westmoreland, IC, 14 x 20.....6.25
Willow, IC, 14 x 20.....5.25
Zero, IC, 14 x 20.....4.50

American Bright Plates—
Almond, 1C, 14 x 20.....$5.25
Brilliant (Tissue Packed), IC, 14x20. 8.00
Brooklyn, IC, 14 x 20.....5.50
Century, IC, 14 x 20.....5.00
Climax, IC, 14 x 20.....4.75
Excelsior, IC, 14 x 20.....6.50
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....5.50
Florida, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Gladys, IC, 14 x 20.....4.50
Hazel, IC, 14x20.....6.80
Ivy, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Linden, IC, 14x20.....5 50
Mars, IC, 14 x 20.....4.50
" IX, 14 x 20.....5.50
Merchant's Dipped, 1C, 14x20.....10.00
Merlon, IC, 14x20.....6.00
Mint, IC, 14x20.....5.00
New Castle Best Palm Charcoal, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
New Castle Palm Charcoal, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.00
New Castle, Charcoal, IC, 14 x 20...6 25
" " IX, 14 x 20...7.50
New Castle, S. Charcoal, IC, 14 x 20. 6.00
" " IX, 14 x 20. 7.25
New Castle Palm Coke, IC, 14 x 20..5.75
" " IX, 14 x 20..6.85
New Castle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Oak, IC, 14 x 20.....4.75
Palma, IC, 14x20.....6.00
Pansy, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.00
Phœnix, IC, 14x20.....5.25
" IX, 14x20.....6.50
Royal, IC, 14x20.....6.25
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Walnut, IC, 14 x 20.....4.65
Youghiogheny, IC, 14 x 20.....6.00

Imported Terne Plates—
Charcoal.
MF Grade, IC, 14 x 20.....$6.2
20 x 28.....12.5
Pontymister Old Style Grade, IC, 14 x 20.....5.50
20 x 28.....11.00
IX, 14 x 20.....6.50
20 x 28.....13.00
Worcester Grade, 1C, 14 x 20.....4.50
20 x 28.....9.00
IX, 14 x 20.....5 75
20 x 28.....11.50
Dean Grade.—IC, 14 x 20.....4.25
20 x 28.....8.50
IX, 14 x 20.....5.50
20 x 28.....11.00
Abercarne Grade.—IC, 14 x 20.....4.00
20 x 28.....8.00
IX, 14 x 20.....5.50
20 x 28.....11.00
Mansel Grade, 1C, 20 x 28.....8.00

Imported Bright Plates—
Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Calland Grade. IC, 10 x 14.....$5.25
" " IC, 12 x 12.....5.50
" " IC, 14 x 20.....5.25
" " IC, 20 x 28.....10.50
" " IX, 10 x 14.....6.50
" " IX, 12 x 12.....7.00
" " IX, 14 x 20.....6.50
" " IX, 20 x 28.....13.00
" " DC, 12½ x 17.....5.00
" " DX, 12½ x 17.....6.50
Allaway Grade. IC, 10 x 14.....4.75
" " IC, 12 x 12.....5 00
" " IC, 14 x 20.....4 75
" " IC, 20 x 28.....9.50
" " IX, 10 x 14.....5.50
" " IX, 12 x 12.....15.75
" " IX, 14 x 20.....5.50
" " IX, 20 x 28.....1.00
" " DC, 12½ x 17.....4.25
" " DX, 12½ x 17.....5.00

Coke.
Steel Coke.—1C, 10x14, 14x20.....4.25
10x20.....6.50
20x28.....8.50
IX, 10x14, 14x20.....5.25
B. V. Grade.—IC, 10x14, 14x20.....4.25

Imported Boiler Plates.—
IXX, 14x28..(112 sheets).....$11.50
IXX, 14x28..(112 sheets).....11.90
IXX, 14x31..(112 sheets).....13.25

Tinning—
Brass and Copper.....
Tubing—
Tin.....55%
Galvanized.....55%

Brass and Copper.—
Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—
Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz....18.00

Wrought Iron Pipe—
1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....50&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Zinc—
600 ℔ casks.....₩ ℔ 4½¢
Per ℔.....5½¢

It Is Reported—

Alabama.

That Stephenson & Raiford, TUSCUMBIA, have sold out their Hardware stock to Conklin & Halsey.

Arkansas.

That Parke & Woodworth, Hardware merchants, GENTRY, have dissolved. The business will be carried on hereafter by J. E. Woodworth.

That K. G. McRae has disposed of his interest in the Wilson-McRae Hardware Company, HOPE, to J. P. Duffie, the remaining partner.

California.

That Johnson & Lord are about to remove their Hardware stock from TULARE to HANFORD.

Connecticut.

That F. T. Blish is about to open a new store in SOUTH MANCHESTER with a complete line of Builders' Hardware, Mechanics' Tools, Cutlery, Sporting Goods, Bicycles, Implements, Seeds, &c.

That the Sandy Hook Hardware Company, HARTFORD, have increased their capital stock from $10,000 to $20,000.

Georgia.

That J. L. Galbraith, formerly of NASHVILLE, Tenn., has opened a Hardware store at OPELIKA.

Iowa.

That C. W. Brelsford has just opened a new Hardware store at VILLISCA. He will handle Hardware, Stoves, Tinware, Buggies, Cutlery, &c.

That W. H. Stepanek, CEDAR RAPIDS, formerly with Swab & Co., has entered the Hardware business for himself. His store is fitted with the Warren Shelving.

That W. J. Kendall, MARION, has moved into his new brick building. The store has been fitted up with the Warren Shelving.

That Stearns Bros. & Co., a new Hardware firm, are preparing to open a store at GARDEN GROVE.

That D. E. Shauger has bought out the Hardware stock of J. G. Gates, EXIRA, and will continue the business, considerably enlarging the stock.

That H. N. Crooks, Hardware merchant, NASHUA, have sold out to Mr. Potter.

That C. L. Hunt and J. B. Booth of Albany, Ill., have recently purchased a Hardware stock at ELDON.

That R. R. Plane & Co., Hardwaremen, INDEPENDENCE, have been succeeded by I. C. Plane.

That Rust & Young, Hardware, WEBSTER CITY, have been succeeded by D. F. D. Young. E. A. Young will be manager of the store.

That R. J. Bennett has entered the Mardware business at DAVENPORT. Hr. Bennett is from MOLINE.

That J. W. Connelly of WEST POINT has purchased a half interest in the Link Hardware Company, and the style will hereafter be the Link-Connelly Hardware Company.

That Edward Walthers has purchased an interest in the Hardware firm of Wilson, Beamer & Co., WASHINGTON.

That Audas Bros., Hardware dealers, GRAY, have sold out their business to Greenwaldt & Groteluschen. Mr. Greenwaldt is from Cherokee County, and his partner from the neighboring State of Nebraska.

Kansas.

That W. F. Lucas is successor to Millard & Lucas in the Hardware business at ARGENTINE.

Maine.

That Ridley & Jones, Hardware and Stoves, BRUNSWICK, were succeeded January 1 by Ridley & Eaton.

That the Hardware firm of W. B. Arnold & Co., WATERVILLE, recently received a very large shipment of Window Glass. It consisted of 440 boxes, weighing 33,000 pounds.

Massachusetts.

That W. R. Cunningham & Son, Hardware merchants, MILLBURY, are now occupying their new quarters.

That Burlingame & Darby's Hardware store, at NORTH ADAMS, was robbed on the 23d inst.

That Howard & Morrow, Hardware merchants, PITTSFIELD, were burned out on the 17th inst.

That J. Walter Davis, WEST GARDNER, will add Paints, Oils, Colors, Glass, Putty, &c., to his Hardware line after February 1.

Michigan.

That a new Hardware firm will be established at MULLIKEN in the spring.

That Dickinson & Raymond's Hardware store, at FENNVILLE, was burned out on the 25th inst.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A thoroughly competent galvanized iron cornice worker who understands drawings and is not afraid to work, as ASSISTANT FOREMAN in shop; a young man with ambition and modern ideas preferred; must be sober. "X.," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. Feb. 2

A good all round man who understands plumbing, tin work and general job work, pipe work, &c.; must be strictly temperate and reliable; steady job for right man; state age, experience, married or single and wages expected. Wilkinson & Watson, Oberlin, Ohio. Feb. 2

A practical TINNER capable of doing country tinning and plumbing; in country town with water system; give age and experience, married or single and wages wanted. Box 32, Newport, Perry County, Pa. Feb. 2

A first-class SALESMAN for the Eastern portion of the State of Pennsylvania; one who has traveled in that territory, and has an extensive acquaintance with the trade, and understands stamped, pieced and japanned ware, metal goods, tinmen's supplies and house furnishing hardware. "S. S. & Co.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

A FOREMAN for boiler shop; must be a first-class and experienced mechanic; able to calculate costs, make accurate estimates and build work cheaply; do not apply unless strictly sober, industrious and in good health. "Boiler Maker," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

A good boy, between the age of 16 and 18 years, to learn the tinsmith and plumbing trade; one who uses profane language need not apply; a good home for a good boy; terms, $30 per year with board and washing; must serve three years. A. M. Kreider, Lititz, Pa. Feb. 2

At Cleveland, Ohio, FOREMAN for small machine shop working on repair work; applicant must have practical experience, with a fair education. Address in own handwriting, stating age, experience, education and wages expected, "Foreman," care of E. S. Adams, 312 The Cuyahoga, Cleveland, Ohio. Feb. 2

By manufacturer, A1 TRAVELING SALESMEN visiting the stove and house furnishing trade to sell our gasoline stove specialty on commission; big seller; state territory traveled. "Gasoline Stoves," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 2

SITUATIONS WANTED.

By first-class plumber, as FOREMAN of some shop; country preferred; can estimate on all kinds of work and can handle men to good advantage; expert on all kinds of pump work, also steam and gas fitting; would like to correspond with some good firm wanting such a man. "R. P. F.," 706 Fourth street, Marietta, Ohio. Feb. 2

By a PLUMBER, in city or country. W. Chandler, 277 West 127th street, New York City. Feb. 2

Steady job, by a PLUMBER and GAS FITTER; willing to do anything; sober and reliable; wages moderate. H. W. Bauer, P. O. Box 55, Wakefield, N. Y. Feb. 2

By a practical man of 12 years' experience as FOUNDRY FOREMAN on stove plate, bench or heater work; thoroughly posted on iron and iron mixtures; strictly temperate; can furnish first-class references. "S. P.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

By a first-class TIN, BRASS, COPPER and SHEET IRON WORKER; 20 years' experience; references; steady job desired, city or country. B. Maurer, 63 Lewis street, New York City. Feb. 2

A TIN PLATE SALESMAN who has had 15 years' experience, having been in the employ of two prominent tin plate firms, both as salesman on the road and five years as manager of a Chicago branch, desires to make arrangements with a Pittsburgh or Western tin plate mill to represent them in Chicago and large adjacent cities, he having sold this trade in the past. "Tin Plate," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 2

As FOREMAN or STEEL MAKER; age 40 years; have had 25 years' experience as foreman and molder in steel and iron foundry; can make all grades of crucible steel castings, warranted perfectly sound, soft and smooth, need no annealing; or will sell mixtures, facings and plan of furnaces, so that any brass or iron foundry at a small outlay can make their own steel castings; castings made one day can be used the next; for A1 reference and samples of steel, address "Steel," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 2

A young man who has been connected with the STOVE, HEATER and RANGE business for the past 20 years, and thoroughly acquainted with the management of all its varied interests, will accept a position of responsibility and trust. "Push," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Feb. 2

By a practical PLUMBER and GENERAL JOBBER, in city or country; steady, honest and sober; willing to work cheap. J. D. Abrams, Box 75, Hempstead, N. Y. Feb. 2

A thorough business man, who has had years of experience in all that pertains to the management of a manufacturing and mercantile business, desires a position as representative of a large manufacturing establishment as SALES AGENT or MANAGER of branch house. "W. J. A.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia. Feb. 2

By an all around TINSMITH, who has a knowledge of iron pipe and furnace work; 11 years' experience; first-class reference. P. O Box 237, Marlboro, N. Y. Feb. 2

By a young man 28 years of age, as FOREMAN of sheet iron work for shipbuilding company; 12 years' experience at house and ship ventilating; thoroughly understands the three systems of pattern development; had charge of work for marine department of Maryland Steel Company, Sparrow's Point, Md., F. B. King, superintendent; can come well recommended. "Ready," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

As FOREMAN in iron foundry, by a man of experience in the stove and heater trade; reference, A. C. Mott of the Abram Cox Stove Company, Philadelphia. E. N. Humphreys, 917 West Somerset street, Philadelphia, Pa. Feb. 2

By a TINSMITH of over 25 years' experience at furnace, iron pipe and general job work; understands tin assortment work; competent to take work and figure from specifications; references furnished. P. O. Box 489, Brockport, N. Y. Feb. 2

Steady job desired by a TINSMITH; good at furnaces, piping and general jobbing; 15 years' experience; country preferred. J. W. Wilson, Middle Granville, N. Y. Feb. 2

By an all round man at slate and metal roofing, iron piping and furnace work; fair knowledge of plumbing; a steady job wanted; sober, married, reliable and temperate. P. R. Baker, Pleasant Valley, N. Y. Feb. 2

By a first-class TIN and SHEET IRON WORKER, with a knowledge of plumbing; can wipe good joints; 20 years' experience; would like to hear of a place in N. H., or near by; can give the best of reference, "J. M. C.," 10 Wendell street, South Boston, Mass. Feb. 2

As SUPERINTENDENT or FOREMAN in cornice and roofing shop; thoroughly understands estimating on all kinds of cornice and roofing; also a first-class cutter and draftsman; can give the best of references. "F. N.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

FOREMANSHIP.—I have had 20 years' experience as foreman of a stove works employing from 75 to 100 men, and have a good recommendation; also, I have a sand facing which excels in making smooth castings, which I could use to a great advantage to employer; parties will do well to confer with me as I will work very reasonable. Jno. Ziegler, 139 Brown street, Dayton, Ohio. Feb. 2

A position on the road as SALESMAN or in some good shop as HEATING ENGINEER in steam, hot water or hot air; have ten years' experience in the tinning, plumbing and heating business; guarantee satisfaction; best reference if required; would prefer Western States. "H.," Box 163, Algona, Iowa. Feb. 2

As CORNICE SHOP FOREMAN; fully competent; best references; 20 years' experience; South preferred. "Max," 1131 Humboldt avenue, Chicago, Ill. Feb. 2

PLUMBER wishes a steady position; first-class jobber; wages $2 a day. Wm. Loewenthal, 161½ Hamilton street, New York City. Feb. 2

By a TIN and SHEET IRON WORKER; used to pump work and country jobbing; 40 years of age; an American; temperate; position desired in the South. Box 301, Maynard, Mass. Feb. 2

By a first-class STEAM and HOT WATER FITTER; familiar with combination work; 16 years' experience; want steady employment; can lay out, construct or superintend work; best of references; married. "Steam Fitter," 306 Reformatory street, Elmira, N. Y. Feb. 2

As SALESMAN, by a young man, 28 years of age, who at present has established trade in the tin, sheet and galvanized iron trade; first-class references given. "J. P.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

By a PLUMBER, five years' experience; understands sanitary work and natural gas fitting; fair knowledge of steam fitting; a first-class jobber; willing to work city or country. "R. W. H.," 522 W. Hudson street, Elmira, N. Y. Feb. 2

By a good all around TINNER and SLATER; steady, strictly temperate and willing to work in any part of the country; can give good references. T. F. Maher, 812 Bowman avenue, East St. Louis, Ill. Feb. 2

An expert in plumbing and steam heating, with complete plant of tools and certificate of competency from N. Y. Board of Examiners, desires to join a tinner in country or city. "E. L. V.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

By a young mechanic, 24 years of age; TINSMITH and FURNACE WORKER; inside and outside work; city or country. "Tinsmith," Bedford Heating Company, 2 McDonough street, Brooklyn, N. Y. Feb. 2

By a TINSMITH of 17 years' experience in all branches of the trade; not afraid to take hold of any kind of work; understands hot water and hot air heating, roofing and jobbing; references if wanted as to ability and character; married; German. W. Hammerssen, Benedict Lane, Danbury, Conn. Feb. 2

By a married man, 38 years of age, as STOVE MOUNTER or FOREMAN of mounting department; six years' experience as foreman of shop making large line of stoves and ranges and hot air furnaces. "J. J. F.," care Sager, 361 West Fifty-eighth street, New York City. Feb. 2

By two TIN AND SHEET IRON WORKERS, who can do all kinds of tin and slate roofing, gutters and furnace work and in fact all kinds of inside and outside work; will do anything but black stoves; strictly sober, and can give best of references. "F. & A.," Box 67, Winston, N. C. Feb. 2

By a young man of experience, as clerk in a hardware store; five and a half years' experience at the tin trade; references; Rochester, N. Y., preferred. "W. J. M.," Box 176, Butler, Ohio. Feb. 2

By a young man, as PLUMBER, GAS and STEAM FITTER, at hot water and hot air work; good roofer and spouter; seven years' experience; strictly sober; 23 years of age; has no tools; good references; States of Pennsylvania or New York preferred. Geo. A. Snyder, 73 Hamilton street, Allegheny City, Pa. Feb. 2

By an ENGINEER, to run small engine and boiler, and do other light work; factory preferred. "W.," P. O. Box 200, Rockville Centre, L. I., N. Y. Feb. 2

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,

Solicitors of Patents.

OFFICES:

PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row.
WASHINGTON,
Atlantic Building, 928 F. St.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.

PATENT PRACTICE EXCLUSIVELY.

References Furnished on Application.

E. B. STOCKING, Attorney at Law, 611 F ST., N. W., WASHINGTON, D. C.

Special Notices.

WANTED.

One second-hand 8 ft. Robinson Cornice Brake, also one 3-foot brake, both with foot attachment and gauge. Must be cheap and in good condition. Also full set of second-hand Tinners' Tools. Address, with list and separate prices, "W.," P. O. Box 285, Springfield, Mass.

FOR SALE.
Retail Hardware Store.

Located in one of best towns in Southern Pennsylvania. Stock invoiced January 1, '95, goods taken at lowest market prices. $12,000. Stock is clean and well assorted. Owner desires to retire from business and will sell whole or to a party familiar with Stove and Tin business will sell half interest. Address "P.," No. 22, office of *The Metal Worker*, 96 102 Reade St., New York.

I W A N T

a few good agencies for Construction, Machinery, Contractors' Supples, Building Material and Steam Goods, or would buy outright the right article at the right price. What have you? Address

"416,"
New York Life Building, Chicago.

AN OLD ESTABLISHED Stove, Tin and House Furnishing business with good jobbing trade Plumbing, Roofing and Furnace Work. Located on one of the best avenues in New York City, with full set of Plumbers' and Tinners' Tools and Machines, also horse and wagon, with privilege of doing business under owner's name. Good reason for selling. Business established 30 years. Address

"ESTABLISHED,"
office of *The Metal Worker*, 96-102 Reade St., New York.

Plumbing, Furnace and Range Business For Sale.

Established 19 years. Inquire at
Estate of JAMES DALY,
907 Sixth Avenue.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

New Screw Cutting Lathe and Double Seaming Machine and second-hand Squaring Shears, Rotary Shears, Beading, Grooving and Setting Down Machine, also a number of other machines and stakes of different kinds and two large Heating Stoves, suitable for store or hall; cheap. Inquire

SAM'L A. TEETS,
507 Eighth Ave., New York City.

$2000

will buy a full stock of Stoves and House Furnishing Goods with complete sets of Plumbers' and Tinners' Tools, also good stock of Iron Pipe, Fittings, &c. Location the best. Town good. Stock can be reduced some if desired. Purchaser has control of entire Plumbing trade. Best reasons for selling. Business was established in 1865. Address "RETIRED," office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE or TO LEASE.

An established Plumbing and House Furnishing business at Narragansett Pier, R. I. Inquire of W. H. GRIFFITH & CO., on premises, or address D. D. CLARK, Westerley, R. I.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

Special Notices.

RECEIVER'S SALE.

Notice is hereby given that by virtue of an order of the Howard Circuit Court in the case of John S. Connor, trustee, versus the William G. Fischer Manufacturing Company, the undersigned offers for private sale on and after the twelfth day of January, 1895, all of the real estate owned by the said plant and situated in Kokomo, Howard County, in the State of Indiana. He will also offer for sale at the same time all of the machinery, boilers, engines, tools, appliances, patterns and patents belonging to and used in the manufacture of ranges and safes. In making said sale, he will offer to sell the real estate separately and also the machinery, tools, etc., above specified, or he will sell them as an entirety and will receive bids accordingly.

Terms, one-third cash, balance in nine and eighteen months with interest at 6%, with approved security.

G. W. LANDON, Receiver.

FACTORY FOR SALE AT WHITESTONE, L. I. (30 minutes from New York). With boilers, 15 H. P. engine, machinery, tools, etc. Price, $5000: terms, $2000 cash, balance on mortgage. L. I. Railroad and Sound boats afford cheap freights. Very advantageous for light manufacturing, such as metal work, novelties, hardware, etc. Lot 50x100, facing on two thoroughfares, three-story brick building, 30x90, in excellent condition, with boiler and engine annex building. Address "FACTORY," P. O. Box 2718, New York City.

FOR SALE.

An old established Hardware, Plumbing and Tin business in one of the best towns in California. Will invoice about $5000. Population 5000 and thickly settled surrounding country. Owner has made a small fortune in a few years and doing a good business at present. No shopworn stock. Best of reasons for selling will be given to inquirers. Address "PACIFIC," care *The Metal Worker*, P. O. Box 521, New York City.

FOR SALE.

A paying Hardware, Stove and Tinware business finely located in New England. Stock comprises a full line of Hardware, Paints, Oils, Tinware and Woodenware Have good trade in Steam Fitting, Plumbing, Tin and Sheet Iron work. Exceptional inducements will be offered to right man. Address

"EXCEPTIONAL"
office of *The Metal Worker*, 96-102 Reade St., New York.

WANTED

for 1895, Side Lines, to handle on commission. Must give territory.

HANSELL & BELSON,
144 North 2d St., Philadelphia.

FOR SALE.

A No. 8 Sturtevant Blower, Countershaft and Pulley complete. This blower has been melting from 10 to 12 tons of iron per hour. Address

SCANLAN & CO.,
Louisville, Ky.

FOR SALE.
STOVE PLATE GRINDER,

Complete with countershaft, Tilting Table, Automatic Spindle. Made by the Tanite Co. Has never been used. Will sell very cheap.

S. GREEN & SONS,
Des Moines, Ia.

Special Notices.

WANTED.

A practical corniceman can make favorable lease of established shop. Some capital and good references required. Address "H. H.," office of *The Metal Worker*, 59 Dearborn St., Chicago.

HELP WANTED.

A salesman acquainted with the best furnace trade of New England can obtain position with company manufacturing a complete line of warm air, water and steam heaters. Desire especial attention given to Warm Air Furnace Sales. Line well introduced. An excellent opportunity to right man, with the ability to handle trade. Salary and expenses. Address, with references, "TRIUMPH HEATERS," office of *The Metal Worker*, 96-102 Reade St., New York City

FOR SALE.

The leading stove store in a growing manufacturing city of 20,000, near New York. This is an old, and the best business stand in the city. Large store and moderate rent. We do Steam and Hot Water and Hot Air Heating, Plumbing and Tinning. This is a good investment, but present owner has too much other business to see to. Can inventory down to $3000. Address "A. A.," No. 119. office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE.

130 tons of Sheet Steel from a wrecked stand pipe, a large portion in good condition. Address

P. O. BOX 155,
Maryville, Mo.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address

"STOVE FOUNDRY,"

Office of *The Metal Worker*, 96–102 Reade Street, New York.

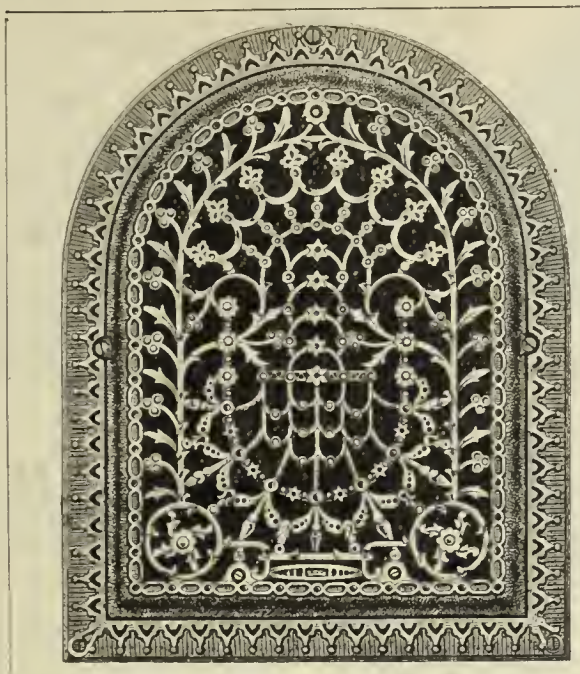
Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

TUTTLE & BAILEY MFG. CO.,

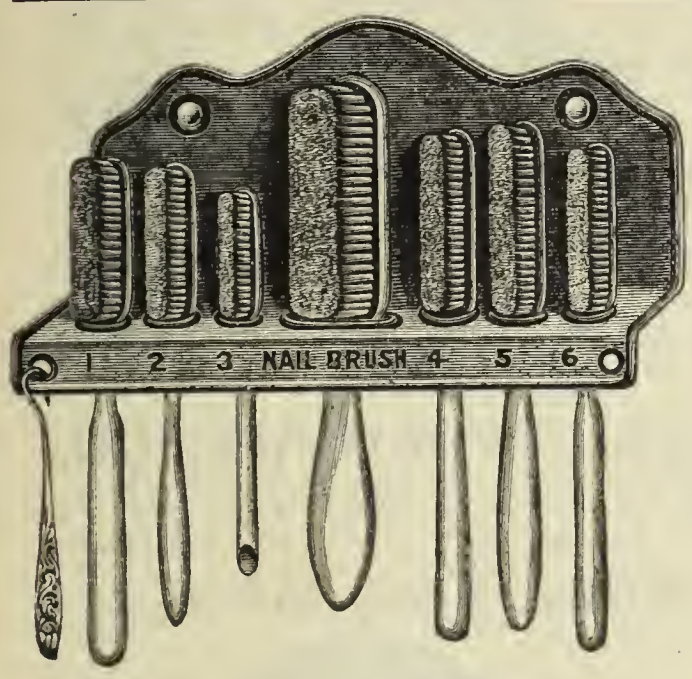
REGISTERS, VENTILATORS, &c.



CROWN DESIGN AND WALL FRAME.

REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.



The "Jewel"

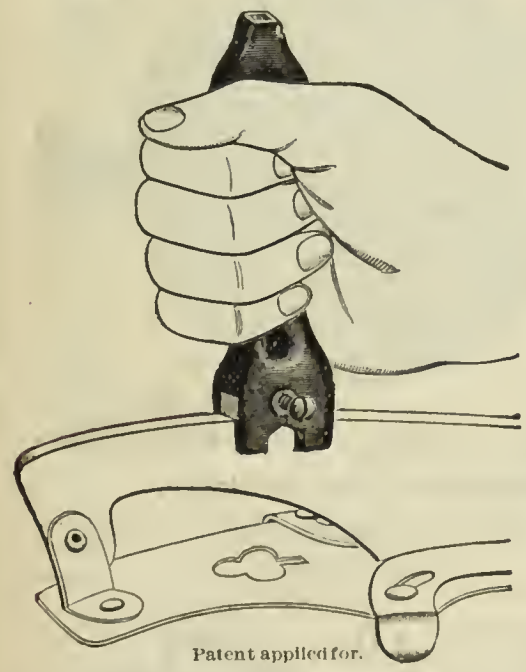
Tooth and Nail Brush Holder.

(Patented Feb. 6, 1894.)

THIS new and novel article fills a long-felt want for an attractive, durable and useful Tooth and Nail Brush Holder. It will hold any size brush, and, as each openin is num bered, the brushes are kept separate and there is no possibility of getting the wrong one. The ornamentation is lithographed on the surface, and it will not peel or wear off.

For sale by all first-class jobbers in House Furnishing Goods, Hardware, Druggist Sundries and Department Stores. Sample mailed on receipt of 15 cents.

KEEN & HAGERTY,
32 S. Calvert Street,
BALTO., MD.



Patent applied for.

The Lightning Skate Sharpener.

With Key and Wrench Combined.

Is the Greatest Little Seller of the Age.

Every skater will buy one when shown. It is only necessary to get two or three out in the boys' hands to set the whole town wild for them.

They can be had of any of the following wholesale houses:

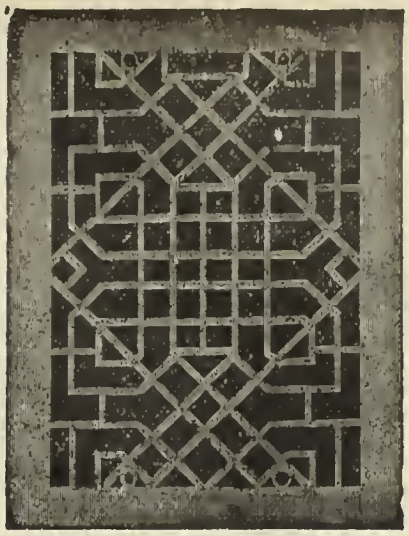
T. M. Roberts Supply House, Minneapolis.
Lewis Bros. & Co., Montreal, Quebec, Can.
Kerr & Robertson, St. John, N. B.
Roberts Stove & Hardware Co., Denver.
The Henry Sears Company, Chicago.
Wells & Nellegar Company, Chicago.
Hatch Cutlery Company, Buchanan, Mich., and 97 Chambers St. N. Y.
Hammacher & Delius, Exporters, N. Y. City.
Puritan Cycle Works, Portland, Me.
A. F. Shapleigh Hdw. Co., St. Louis, Mo.
The Strichter Hdw. Co., Reading, Pa.
G. J. Morton, Yarmouth, N. S.
Barrett Hdw. Co., Joliet, Ill.
Ruth & Stone, 57-60 Wilshire Bldg., Cleveland, Ohio.
Butte Hdw. Co., Butte, Mont.
Wyeth Hdw. & Mfg. Co., St. Joseph, Mo.

Manufactured by

SANDWICH NOVELTY CO., Sandwich, Ill

BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96–102 Reade Street New York.



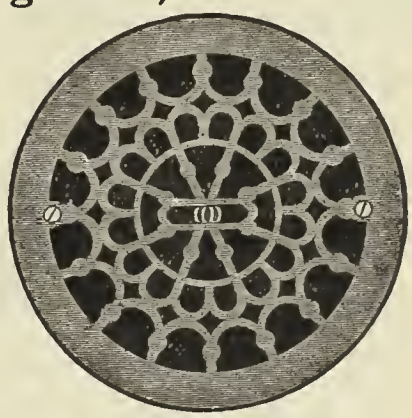
Warm-Air Registers, Ventilators, Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
480 and 436 Niagara Street, - Buffalo, N. Y.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers, Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.

KEUFFEL & ESSER CO.,

127 Fulton and 42 Ann Streets, NEW YORK.

Branches: 111 Madison Street, Chicago.
708 Locust Street, St. Louis.

Drawing Materials AND Surveying Instruments.

Write for

Keuffel & Esser Co.'s Catalogue of 1895.

26th Edition.

Enlarged by over 100 pages. The most complete and reliable catalogue, representing the largest and most complete stock in this line.

— VICTIMIZED. — "If I live long enough," he said moodily, "I hope I'll get over being a natural mark for any bunco-steerer that happens to be loose."

"What's the matter?"

"I concluded I'd have to economize, so I sent 50 cents to a man who said that was all he'd charge to tell me how to make a little money go a long way."

"And what did he tell you?"

"He simply wrote: 'Send five cents by express to San Francisco.'"—*Washington Star.*

— "WHICH song would you rather hear Miss Warble sing?"

"'Mariner Bold.'"

"But she doesn't sing that at all."

"I know. That's why I prefer it."—*Judge.*

— A MAN who asks for credit at all times very seldom asks the price of an article. It don't interest him, inasmuch as he don't intend to pay for it.—*Exchange.*

SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

43 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published

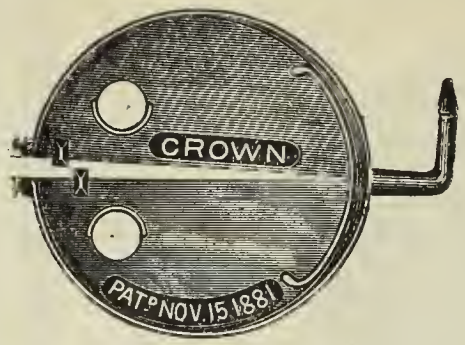
Sent, post-paid, on receipt of price, 25c.

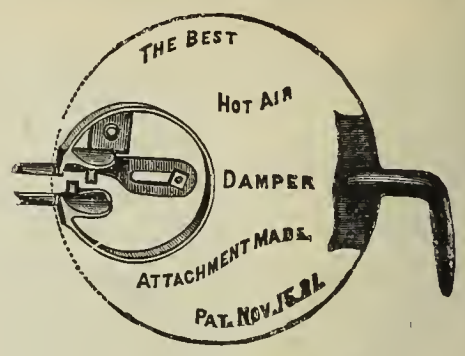
DAVID WILLIAMS,

PUBLISHER,

93-102 Reade St., New York.

Crown Damper and Crown Damper Attachment.





NICKEL PLATED HANDLE. PUT UP 1 DOZ. IN A BOX.

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

AMERICAN Dampers and Clips.

WAFFLE IRONS.

THE BEST



For Gas or Gasoline Stoves.

Easy to Clean, Long Wood Handles.

BUY *NO OTHER.*



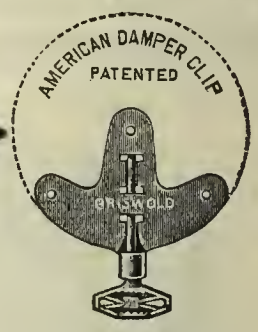
Wood or Nickel Handle.

BEST SELLER.

ASK FOR THE

AMERICAN.

Buy no Other.



JUST OUT.

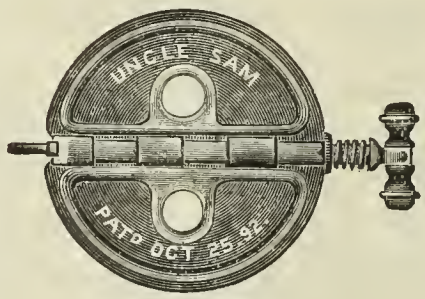
BEST CLIP MADE.

Send for Samples.

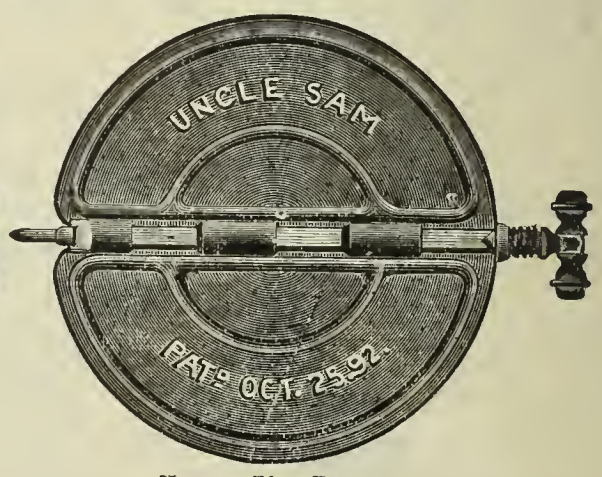
GRISWOLD MFG. CO.,

ERIE, PA.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers



W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.

Manufacturers of

Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.

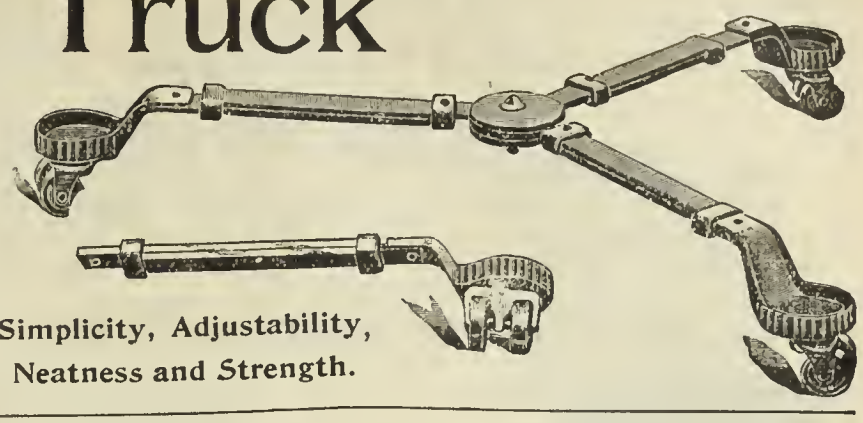


Gem Stove Truck

Not only accommodates itself to a stove with four legs, but, as shown in illustration, is equally as complete with a stove of three legs, a feature no other truck possesses. The adjustment is so perfect that one man can mount any ordinary stove with ease. Price, $30.00 per dozen. 1-3 doz. in neat case.

DISCOUNT TO THE TRADE.

Address **CHAS. F. FOX, - DAYTON, O.**



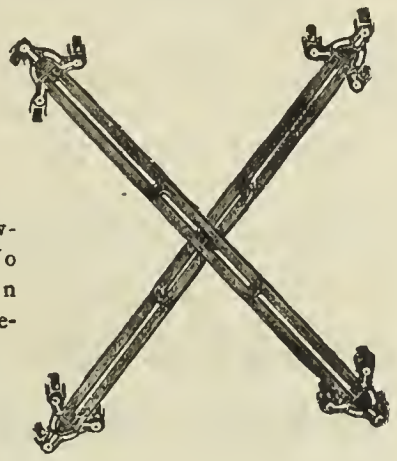
Simplicity, Adjustability, Neatness and Strength.



THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

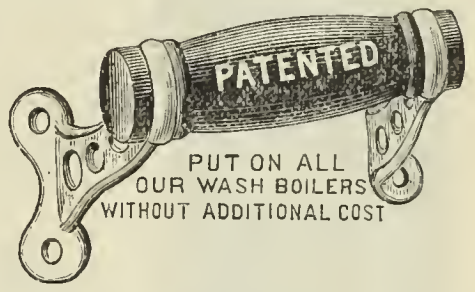
MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.



ROYAL

WASH BOILER HANDLE.



PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,
116 N. 2d St., PHILADELPHIA, PA.

We Carry Stock and can Supply all Kinds of

ALUMINUM

Sheets, Ingots, Wire, Rods, Etc.

WE ARE MANUFACTURERS OF

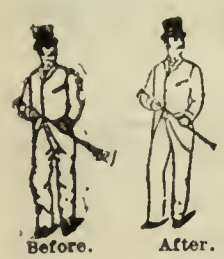
ALUMINUM KITCHEN UTENSILS,

Which are Fast Displacing Enameled Ware.

Aluminum Ware does not rust or flake off and is very durable. Foods cooked in it do not scorch Light and beautiful. A line which will interest every customer and please every purchaser.

SIDNEY SHEPARD & CO., BUFFALO and CHICAGO.

C. W. WELLS, New England Sales Agent, 19 Pearl St., Boston.



Before. After.

Covert Pants Stretcher.

THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

MANUFACTURED ONLY BY

COVERT MFG CO., West Troy, N. Y.



— AN EMBRYO JUDGE OF INSURANCE CASES.—Among our real estate assessors a year or two ago was one named Dennis McElhinney. On his rounds he came to the habitation of his friend Michael Mulcahy.

"Good mornin', Michael," said he.

"Good mornin', Dinnis," returned Mulcahy.

"It's assissin' this mornin' I am, Mike," said the official.

"Thin be aisy wid me, Dinnis. What wid rale estate assissments and shtrate assissments, it's hard work to save enough to pay me Tammany assissment."

"I'll be aisy, Mike. I'll put yez down for tin dollars a fut. Thot will be tirty times tin is tree hundhred for the lot and twinty for the goat."

"Phwat!" cried Mulcahy.

"Tree hundhred for the lot and twinty for the goat."

"The goat's not rale eshtate!"

"It is so, undher the new law."

"Go 'way wid yez!"

"I can prove it to yez," said the assessor, drawing out his instructions. "Rade that, will yez: 'Assiss at its proper valuation per front fut all property boundin' an' abuttin' on both sides of the shtrate.' Manny's the toime I've seen your goat a-boundin' an' a-buttin' on both sides of the shtrate. Twinty dollars for the goat, Mike."—*New York Herald.*

— THE CRAFTY SMALL BOY.—A small tin bank was kept on the Hinman's dining table, and every time any of the four little Hinmans got a spot on the snowy cloth, he or she forfeited a penny, which was dropped into the bank and used for charity.

One day Rupert, a boy of seven, was discovered rubbing with a spoon a part of the cloth hanging below the table in front of his chair.

"What are you doing?" asked mamma.

"Well, I'm trying to rub two spots into one; that's what!"—*Harper's Bazar.*

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

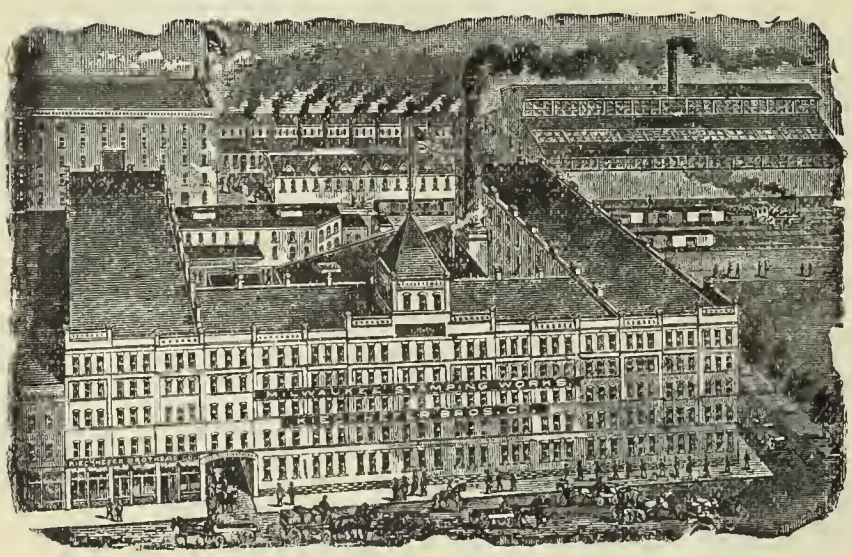


Agents for SPLENDID OIL COOKING STOVES and MAJESTIC OIL HEATING STOVES,

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED, JAPANNED AND ENAMELED PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., **MILWAUKEE, WIS.**

SEND FOR CATALOGUE AND PRICES.

The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O,



ALUMINUM

Ingots, Sheets, Rods, Tubes, Wire and Castings,
Cooking Utensils and Tableware,
Tea and Coffee Pots, Chafing Dishes, Rice Boilers, &c.
Write for New Catalogue.

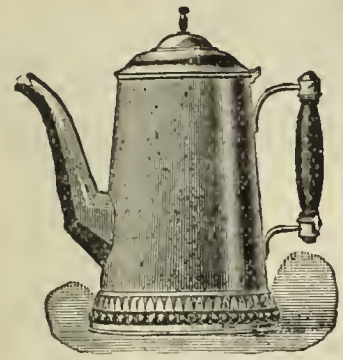
THE WOHLER ALUMINUM COMPANY,
55 Jackson Street, - - - - Chicago, Ill.

MAPLE SYRUP CAN and SAP BUCKET STOCK.

We are now prepared to quote and ship promptly. Get our prices before buying.

J. M. & L. A. OSBORN, - - - CLEVELAND, O.

ROCHESTER STAMPING WORKS. ROCHESTER, NEW YORK,



"ROCHESTER" TEA POT.
Patented.

WANT **50,000** NAMES

To which they may address their

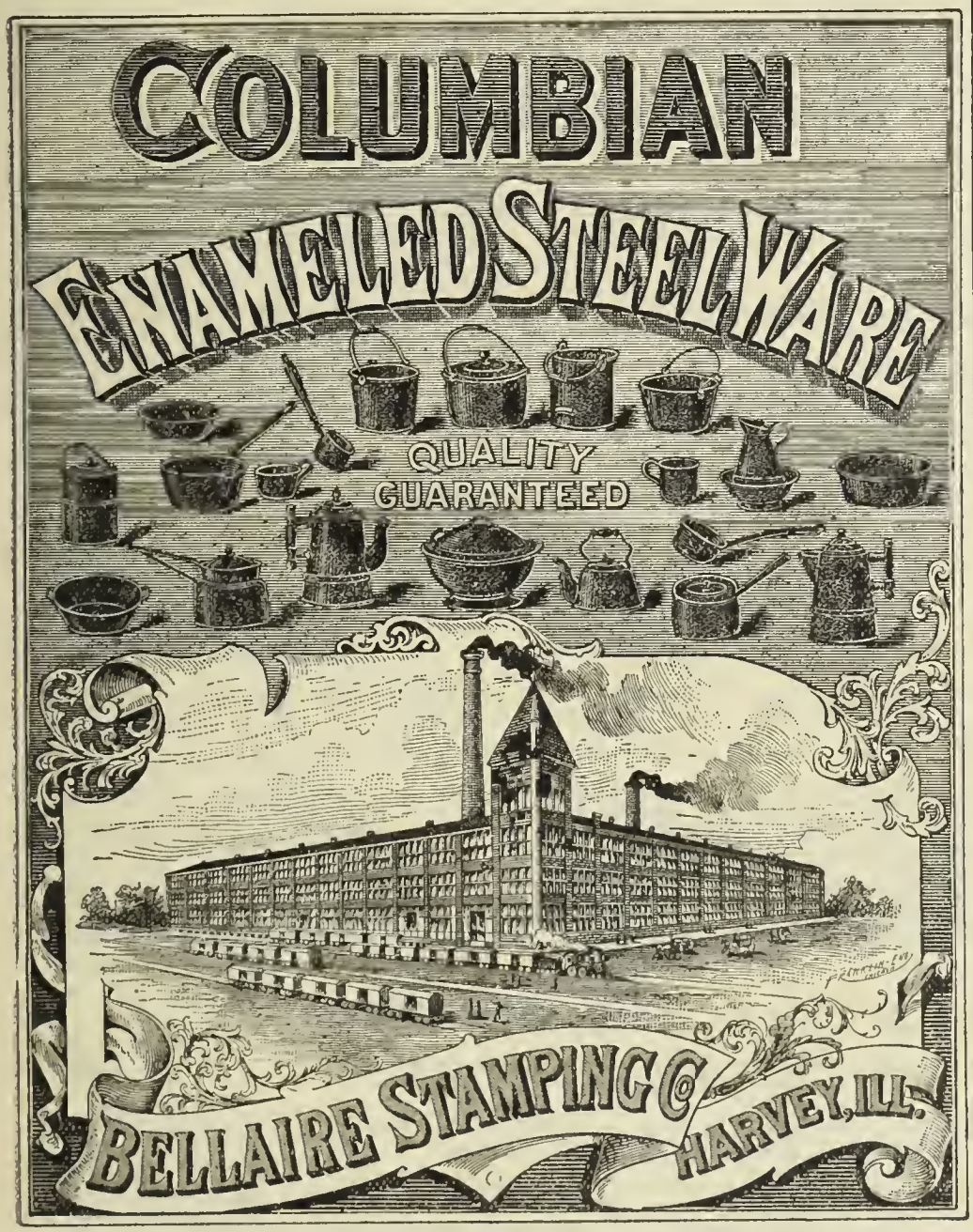
NEW CATALOGUE

For 1895.

No Goods Genuine without our Name.



"ROCHESTER" CUSPIDOR.
Patent Pending.



N. Y. NICKEL PLATING & MFG. CO.

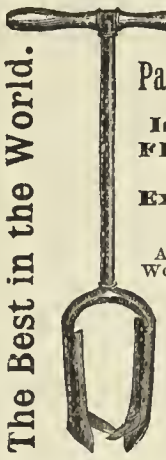
227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods.

The Best in the World.



IWAN'S

Pat. Improved Post Hole Auger

Is CONVENIENT and EFFECTIVE IN OPERATION.

Excellence of Material and Construction.

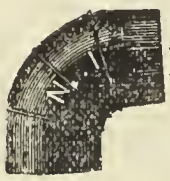
Awarded Medal and Diploma at the World's Columbian Exposition, 1893.

For sale by all leading jobbers in the U. S. and Canada.

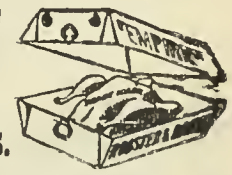
IWAN BROS.,
SOLE MANUFACTURERS,
STREATOR, - ILL.

NEW YORK ELBOW CO.,

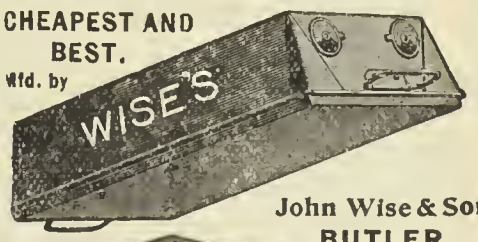
18 Cliff St., N. Y. City.



Makers of
Elbows
AND
Roasters.



CHEAPEST AND BEST.
Mfd. by



John Wise & Son,
BUTLER,
O.



THE TRIUMPH COOKER,

WITH LOCK COVER.

STEAMLESS, ODORLESS AND NON BOIL-OVER.

THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.



A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.

THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN

— STATISTICS.—"My good man," said the severe lady, "have you ever stopped to think how much money is wasted each year for tobacco and rum?"

"No, mum, I hain't," answered the object. "It's atakin' up all my time jist now to figger out how many pore families cou'd be supported on the price of the extra cloth women puts in their sleeves.—*Indianapolis Journal.*

We are Advertised by our Loving Friends."



Pat. Jan. 19th, 1895.

Look Here,

Hardware and Housefurnishing Dealers. An article you **must** keep is the wonderfully popular

Crusty Bread Pan.

The most perfect bread baker ever made. Every lady trying it acknowledges that **tests make customers** for this pan, and **that is a fact.** The Clark-Sawyer Co., a big Department Store of Worcester, Mass., say: "They are a good thing, and will make their own way, if people can be made to give them a trial." Your jobber must be in the list below. Write them for prices. They all carry this popular pan in stock.

MADE ONLY BY

The Niles Mfg. Co.,

NILES, OHIO.

HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ill.
HORTON, GILMORE, McWILLIAMS & CO., Chicago, Ill.
WM. FRANKFURTH HARDWARE CO., Milwaukee, Wis
JOHN PRITZLAFF HARDWARE CO., St. Paul, Minn.
FARWELL, OZMUN, KIRK & CO., Winona, Minn.
R. D. CONE CO, St. Louis, Mo.
A. F. SHAPLEIGH HARDWARE CO., Kansas City, Mo.
RICHARDS & CONOVER HARDWARE CO, St. Joseph, Mo.
WYETH HARDWARE & MANUFACTURING CO., Denver, Colo.
THE GEORGE FRITCH HARDWARE CO., Council Bluffs, Iowa.
EMPKIE-SHUGART CO., Davenport, Iowa.
SICKELS, PRESTON & NUTTING CO., New Orleans, La.
A. BALDWIN & CO., Limited, Atlanta, Ga.
FITTEN-THOMPSON HARDWARE CO., Nashville, Tenn.
PHILLIPS & BUTTORFF MANUFACTURING CO., Louisville, Ky.
STRATTON & TERSTEGGE, Cincinnati, Ohio.
THE F. H. LAWSON CO., Indianapolis, Ind.
VAN CAMP HARDWADE & IRON CO., Detroit, Mich.
STANDART BROTHERS, Cleveland, Ohio.
THE GEO. WORTHINGTON CO., Pittsburgh, Pa.
THE McINTOSH-HUNTINGTON CO, Buffalo, N. Y.
L. H. SMITH WOODEN WARE CO., Limited, Utica, N. Y.
WALBRIDGE & CO., Elmira, N. Y.
CHARLES MILLAR & SON, Philadelphia, Pa.
BARKER, ROSE & GRAY, New Haven, Conn.
SHIELDS & BROTHER,
C. S. MERSICK & CO.,

For

1895

We respectfully solicit your orders for

Pieced Tin Ware,
Stamped Tin Ware,
Japanned Tin Ware,
Black Sheet Iron Ware,
Galvanized Sheet Iron Ware,
Enameled Ware,

and guarantee satisfaction, both as to quality and prices.

Respectfully,

The Geuder & Paeschke Mfg. Co.

Manufacturers,

St. Paul Ave. and 15th St., Milwaukee, Wis.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

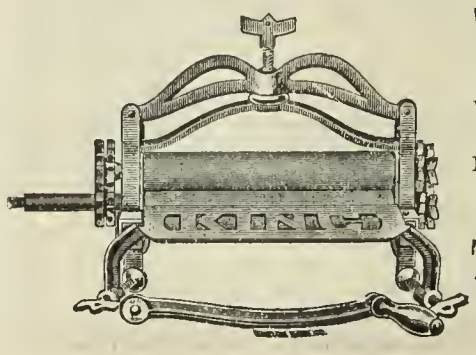
A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces.
Length, 10 inches.
Can be sold in all seasons.

Write to Manufacturers for Prices.



WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.
Boston Office, H. F. Livermore & Co., 34 Oliver St.

"NEVER-BREAK" STEEL HOLLOW WARE



WON'T WARP.



WON'T WARP.

STEEL SPIDERS, GRIDDLES, KETTLES, MASLINS, ETC.

Send for Catalogues of all our lines and Discounts.

THE STANDARD FOR WEIGHT, FINISH AND PRICE.

IMMEDIATE SHIPMENTS GUARANTEED.

The Bronson Supply Co., New York and Cleveland.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

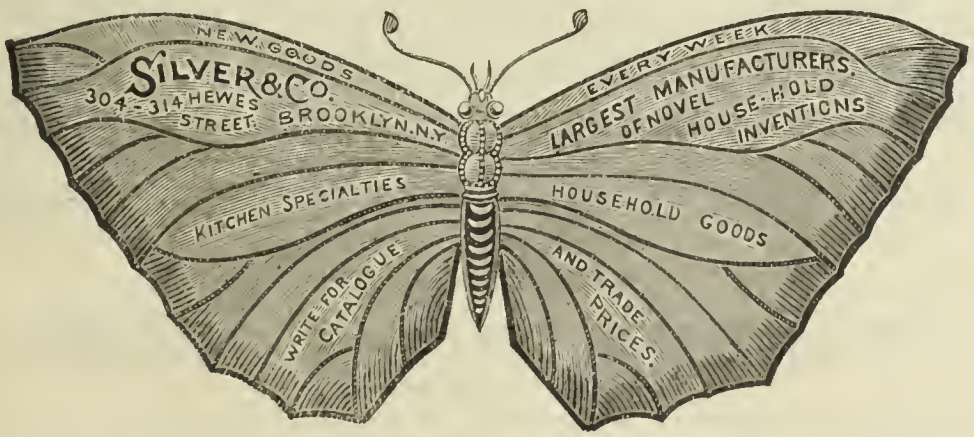
Write us for Catalogue and Prices.



ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.



EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES.

"MARION HARLAND" Tea and Coffee Pots and Urns.
Royal and Crown Roasters and Bakers.
Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.
Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses,
Steam Cookers, Milk Sterilizers, Bread and Cake Pans,
Display Stands and Household Novelties.



NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

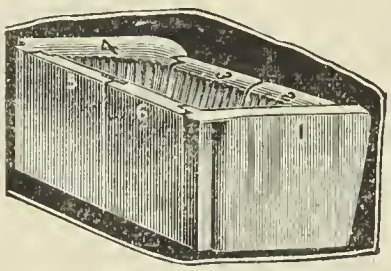
Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

McLEOD & HENRY Co. TROY N.Y.



Stove Linings

A SPECIALTY.



THE DIAMOND THIMBLE IS THE BEST.
Manufactured by
S. CHENEY & SON
MANLIUS, N. Y

— Do all business men advertise? It seems so, for we never hear of any who don't.—*Printers' Ink.*

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,
74 Beekman Street, New York.
Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE CONNECTICUT PLATING CO.,

No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c.

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work.
Estimates cheerfully submitted.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers original patterns

MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH

WHEN HE SAYS THAT THE

RUTLAND LINING

FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

"FIRESTONE"

Has proved I self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



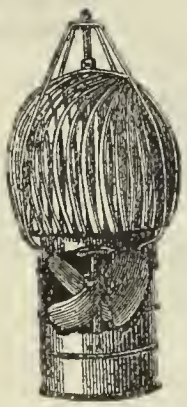
Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

SELF LUBRICATING



Rotary Screw Ventilators

WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

46 Cortlandt St., New York

☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

315 North 2d St., - - - Philadelphia.

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.

Established 1866.

EDWARD L. CALELY,

STOVE PATTERNS

TO ORDER.

345 Ridge Ave., PHILADELPHIA, PA.

Leather and Rubber

WASHERS,

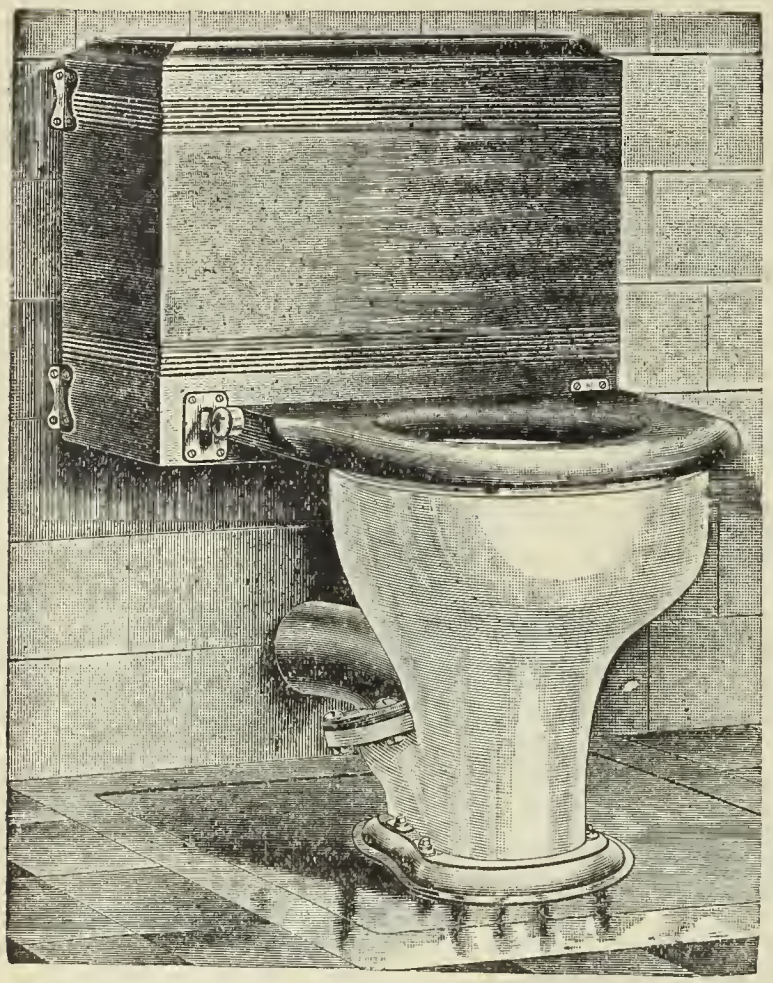
Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.

PURITAN WASH DOWN WATER CLOSET.

Best Closet Yet Produced for Either Public Places or Private Houses.



In presenting this Water Closet Apparatus to Architects and Plumbers and those interested in Sanitary Plumbing, will say that our aim has been to **Improve the Quality, Simplify the Construction and Reduce the Cost of Fitting in Place,** and we feel confident that we have done all this in the present Apparatus, and more too, **as it will discharge more matter, keep cleaner with less water and make less noise in the operation** than any Water Closet Apparatus now on the market.

The Closet is especially well adapted for Fire Proof Structures, as the Soil Pipe may be run above the floor, either behind or on the face of the finish. Another very good feature—stoppage can only take place in the bowl (where it can be reached from the top). Anything that passes this point will not lodge in the Soil Pipe.

These Closets are made of Vitreous Earthen Ware—that is, an absolutely non-absorbing material, warranted not to craze. Each Closet is stamped with a Bull's Head, our trade-mark.

The tank is provided with a cover finished to match. This cover deadens the noise, prevents fouling by dust and also prevents malicious persons from getting at or throwing anything into the tank.

The tank is worked either by hand action or seat action.

The distance from top of tank to finish of floor is 2 feet 6½ inches. From face of wall to front of Closet, 2 feet 1¾ inches. Depth of seal in Closet 2¾ inches.

SEND FOR CATALOGUE.

MANUFACTURED BY

DALTON-INGERSOLL COMPANY

169-175 High St. & 55-61 Purchase St. (Ft. Hill Square),

BOSTON, MASS.

DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.



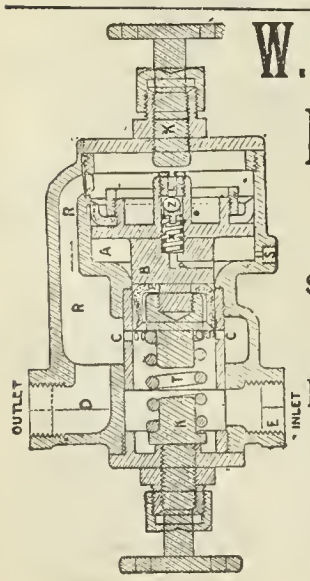
The only Portable Folding Bath tub made; can be stored in space 2⅛ x 2⅛ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discount

MADE BY

THE DAY MFG. CO.

Detroit, Mich., U. S. A.



W. G. Taafel's Pressure Regulator.

Send for Price-List

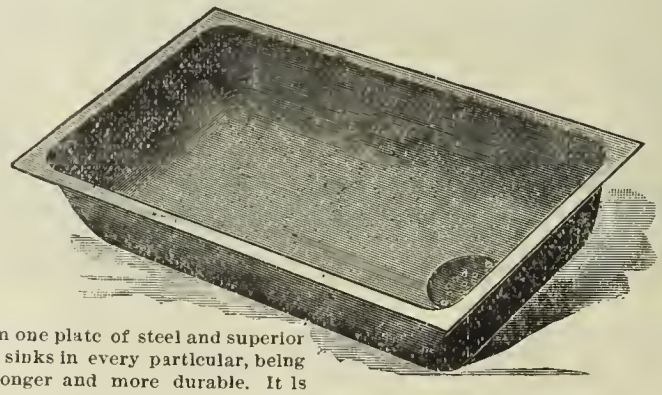
NEWARK REGULATOR COMPANY

Newark, Ohio.

THE

NEW ERA

Wrought Steel Sink



Drawn from one plate of steel and superior to cast iron sinks in every particular, being lighter, stronger and more durable. It is well known that cast sinks break easily in shipping, storing and placing in position for use and from other causes. This sink being made of wrought steel will not break from any cause whatever, and being less porous than cast iron is comparatively odorless.

The bottom is formed tapering to the center and the outlet, giving the sink perfect drainage. The bowl and projecting thimble are stamped in one piece from the same plate, enabling the attachment of strainer and pipe more satisfactorily than is possible with cast sinks.

: : THE : :

Kilbourne & Jacobs Man'fg Co.,

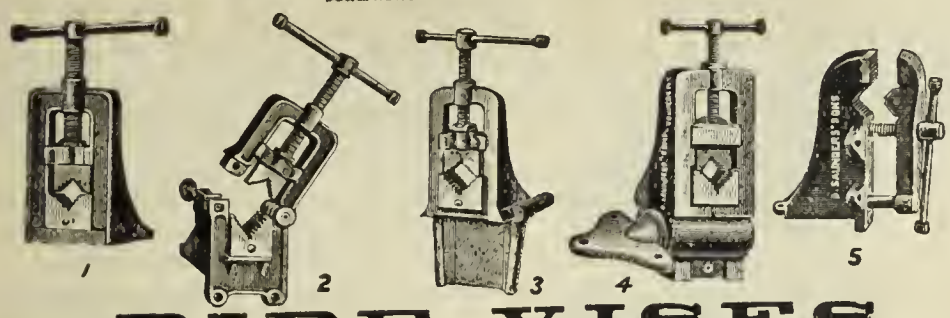
Columbus, Ohio, U. S. A.

Being The Originators

of wrought steel sinks, we are in position to supply them in any style desired, at prices which we shall be pleased to quote upon application.

D. SAUNDERS' SONS,

Manufacturers of Improved



PIPE VISES

of all styles and sizes holding ⅛ in. to 8 in. pipe, made of **MALLEABLE IRON, CAST IRON and STEEL** Also **PIPE THREADING MACHINES** ¼ in. to 16 in., Hand Pipe Cutters, Stocks and Dies, Tapping Machines, etc. Send for catalogue to

27 Atherton Street, Yonkers, N. Y.

ZERO VALVE CO.,

212 Seneca St.,
Buffalo, N. Y.

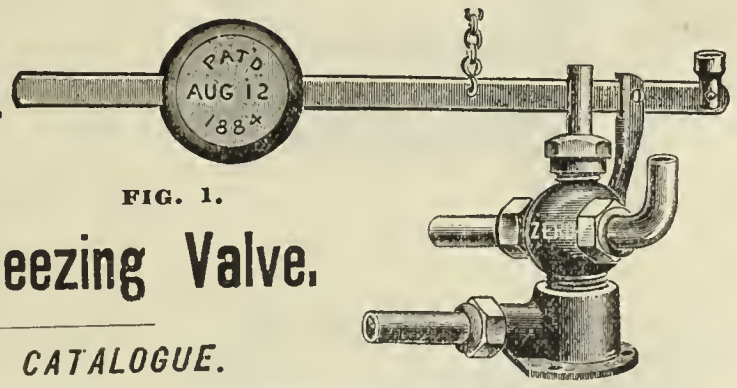


FIG. 1.

Zero Anti-Freezing Valve.

SEND FOR CATALOGUE.

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

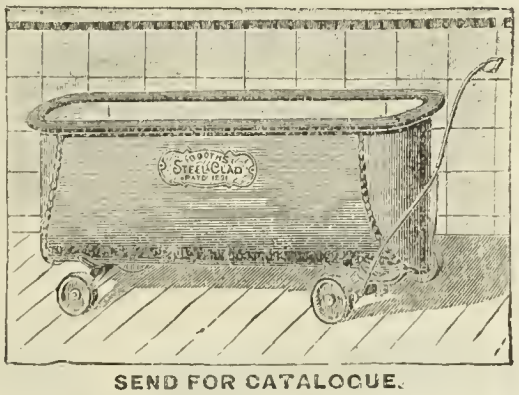
INEXPENSIVE.

It is light, durable, cleanly, low in price, never rusts out, cannot break. Can be decorated to suit individual taste. A boon to country householders, who by its use can enjoy a comfortable bath without expensive piping or the labor of carrying water. There are many styles and sizes of the **Steel Clad Bath**, but only one quality. Don't buy an imitation. Get the **Steel Clad**. All plumbers and jobbers have it, or the

STEEL CLAD BATH CO. OF NEW YORK,
447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,
Detroit, Mich.
GEORGE BOOTH, President.

FOR HOSPITALS AND THE SICK ROOM.



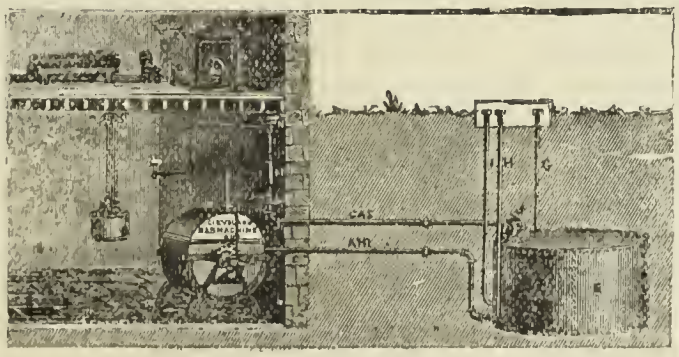
SEND FOR CATALOGUE.

CLEVELAND GAS MACHINE CO.

82 Champlain St., Cleveland, Ohio.

Please send for **Reduced Price** List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engives.



THE

KELLY SHOWER BATH RING.

Patent Applied For.



It Will Produce Better Results Than a $100 Shower Bath.

For particulars write

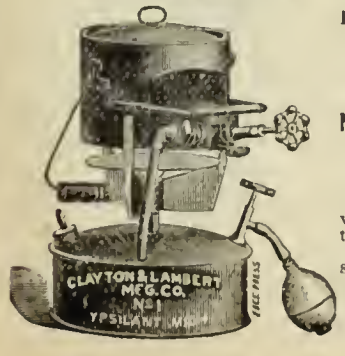
Thos. Kelly & Bros.
Manufacturers of Permanent Plumbing Goods,
124 Franklin St. CHICAGO.



The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating burners.** It is a modern, perfected apparatus, warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adjustable burners. Send for catalogue.

C. M. KEMP MFG., CO.,
BALTIMORE.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.
Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screwdriver being all the tools needed to apply it.



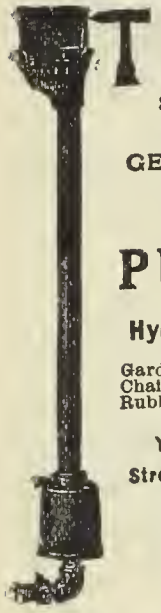
Mender tubes are seamless brass, give full water way, are easily inserted and will not rust. Sold by Jobbers everywhere. Write for circular and *free sample*.

Clayton & Lambert Mfg. Co.

30 Washington St., - Ypsilanti, Mich.



W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

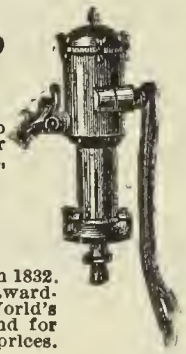
85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON

156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

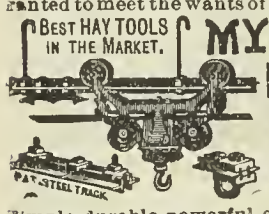
Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS'

REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



FORCE AND LIFT PUMPS

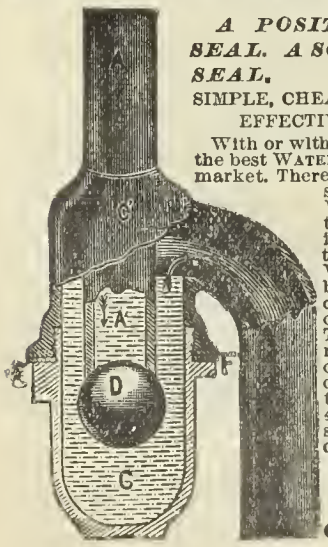


Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

M. E. MYERS & BRO., ASHLAND, O.

THE BOWER

SEWER GAS TRAP.



A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

SIMPLE, CHEAP.

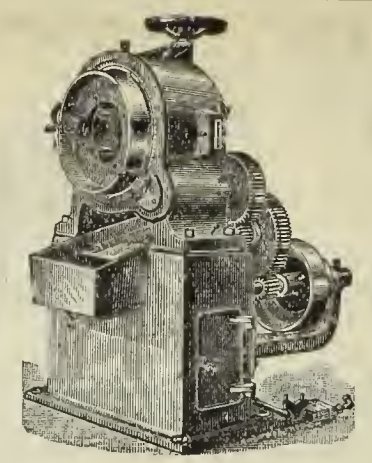
EFFECTIVE and DURABLE.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 48-page pamphlet sent free on application.

B. P. BOWER & CO.

Manufacturers,

Cleveland, Ohio



No. 3½ Power Pipe Threading Machine Range 2½ to 6 in., Right Hand.

When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

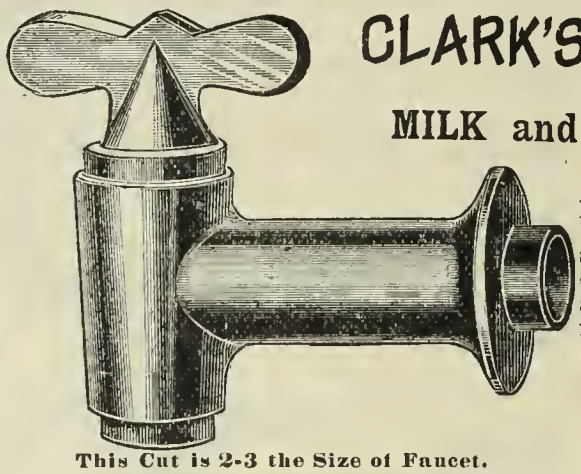
CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.

CLARK'S NEW FAUCET

—— FOR ——

MILK and CREAM CANS, ETC.



This Cut is 2-3 the Size of Faucet.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.



GUM A RUBBER,

Or

RUBBER GUM,

Or

Elastic Cement.

No matter what you call it,

IT'S A DANDY.

Just what you want to make a pipe joint tight. It discounts

WAX, RED LEAD, BLACK LEAD.

Holds the mercury sky high on a test job.

BAILEY-FARRELL MFG. CO.,

PITTSBURGH.

The "Boyd" Basin.



Made in Ivory Body and all styles of Decoration.

THE ACME OF SANITATION.

HAVE YOU SEEN IT?

IF NOT, GET POSTED.

We Will Post You.

PECK BROS. & CO.,

Fine Sanitary Goods,

47 Cliff St., NEW YORK — 127 Chestnut St., NEW HAVEN, CONN. — 259 Wabash Av., CHICAGO. — 65 Oliver St., BOSTON.

Don't Buy

*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

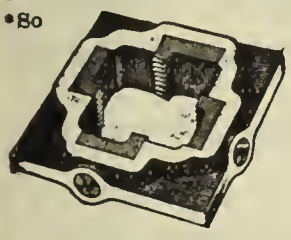
Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;

Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**

Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence** of quality.

If by chance you do not think these points, or the saving of money, objectionable,

*80



Send us a Postal Note for 62 Cents (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, PA., U. S. A.
SEND FOR CATALOGUE OF THE "SKELETON" PIPE DIE

SIMS'S ADJUSTABLE EAVE TROUGH.



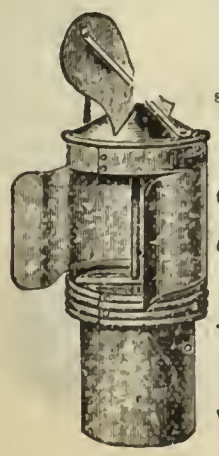
Pat. Jan. 14th, 1890.

Various Designs of Galvanized Sheet Steel Eave Troughs, Mitres, and Ridge Rolls, Roof Gutters, Expanding Conductors, Elbows, etc., etc.

THE SIMS MFG. CO., Sole Manufacturers, **NEWARK, OHIO**



BERGER BROS.,
TINNERS' HARDWARE, ROOFERS' SUPPLIES,
231 AND 237 ARCH STREET, PHILADELPHIA.
GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,
LARGEST STOCK, GREATEST VARIETY, PROMPT SHIPMENTS.
Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Rods, Elbows, Ears, Handles, Valves and Plungers, etc.
GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.



REVOLVING CHIMNEY CAPS,

Galvanized Iron.

These Caps revolve on heavy glass bearings, and are made from No. 26 iron. All sizes; cheapest and best.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

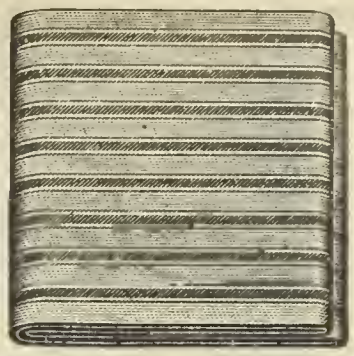
Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted Leader, cheapest and best in the market. Sheet Iron Piping, Stove Pipe and Fittings of every description.

GENERAL GALVANIZING TO ORDER.

THE JERSEY CITY GALVANIZING CO., Manufacturers and Jobbers in
GALVANIZED MATERIAL OF EVERY DESCRIPTION.

Works, Jersey City. Store, 112 John St., New York.
SEND FOR CATALOGUE.



It requires considerable skill to make a good wiped joint—considerable skill, also, to make a proper **Wiping Cloth.** And while one cannot manufacture a wiped joint, we can and do make and sell a perfect **Cloth.**

One that will outwear two of the ordinary kind.

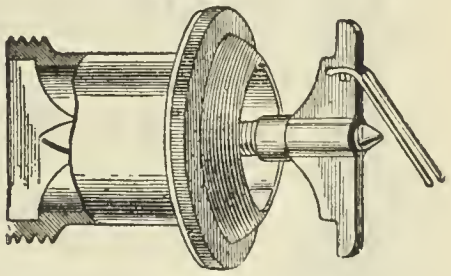
One that you can buy cheaper than you can make.

Send us 12 cents (and 2 cents for postage) for a sample (any size; for any kind of a joint) and see if the "Columbia" Wiping Cloth is not a model of its kind, then send 70 cents (and 12 cents for postage) for six of any size by mail. See that each one is stamped "Columbia."

THE
J. W. Chamberlain Co.,

Plumbing and Steam Fitting Specialties,
BANGOR, - - MAINE.

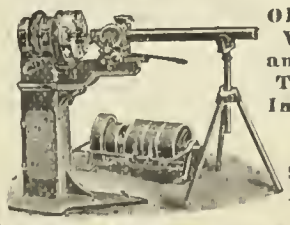
CLOSET REPAIR COUPLING.
(Patent applied for.)



MADE in two styles, to suit iron and lead pipe.
TAKES the place of the old spud and necessitates no change in fixtures.

MANUFACTURED ONLY BY
SAVILL, WALLS & CO.,
Mfrs. of Plumbers' Supplies,
229 Budden Street - - PHILADELPHIA.

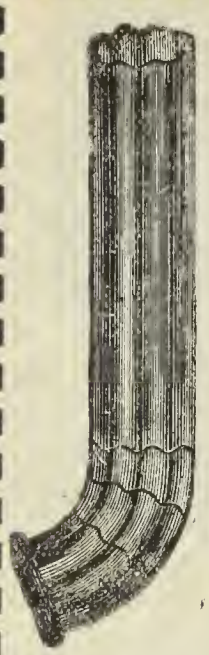
PIPE THREADING AND CUTTING OFF MACHINES, WATER, GAS and STEAM FITTERS' TOOLS, Improved Hinged Vises, Pipe Wrenches, Stocks and Dies.
Acknowledged to be the Best.



ARMSTRONG MFG. CO.,
N. Y. OFFICE: 139 Centre St. Bridgeport, Conn.



CHUCKS The National
All sizes and styles. Patented **Reversible Jaws.** Illus. catalogue. The standard Chuck since 1882.
Address W. WHITLOCK, 39 Cortlandt Street, New York.



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**







W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.



BROUGHTON'S PATENT SELF CLOSING BASIN COCK

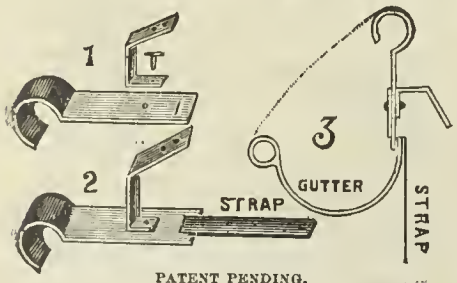
EVERY ONE WARRANTED

Send for Circulars.

Stebbins Manufacturing Co., Brightwood Mass.

SOLE MANUFACTURERS.

STRAP E. T. HANGER.



PATENT PENDING.

TINNER, ATTENTION!

Save the narrow strips of Galvanized Iron and Tin that you have been taking to the Dump, for the **Strap Hanger.** Any wide awake TINNER can see at a glance the saving. Cut No. 1 shows Hanger as they are packed—Gross in a Box. **$2.50 per Gross,** freight allowed.

Discount to the Trade.

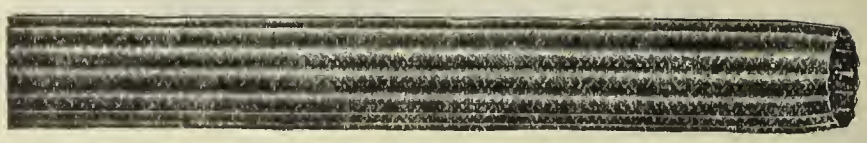
MANUFACTURED BY

JOHN SEVERDING, - Richmond, Ind.

Eave Trough.



Conductor Pipe.

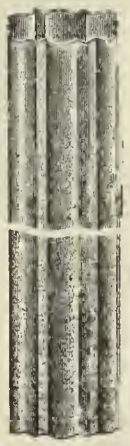


EAVE TROUGH, CONDUCTOR PIPE, &c.

DO YOU WANT the very best? If so address the manufacturers and receive their prices. They can save you money, as well as furnish you with superior goods, made on greatly improved machinery.

THE KANNEBERG ROOFING CO.,

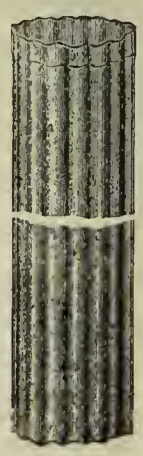
CANTON, OHIO.



Corrugated Expanding Conductor

OF GALVANIZED IRON AND COLD ROLLED COPPER.





JAMES A. MILLER & BRO.,

129 and 131 South Clinton St.,

CHICAGO.



USE "OUR OWN" BASIN PLUGS.

No other lettering on them.

SAMPLE DOZEN ASSORTED $1.

HANDSOMELY NICKELED. BEST QUALITY STOCK

H. O. CANFIELD

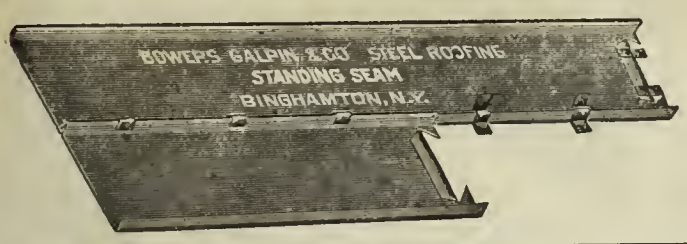
MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.



BOWERS, GALPIN & CO.

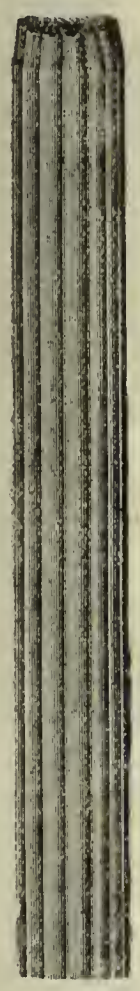


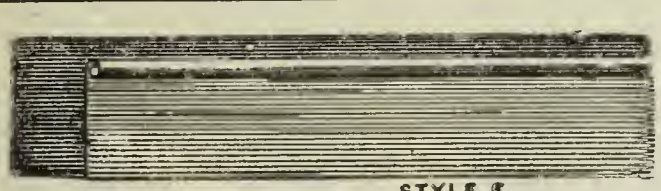
Standing Seam and Roll Roofing.

Painted Steel, Terne and Galvanized.

—MANUFACTURED BY—

BOWERS, GALPIN & CO., Binghamton, N. Y.





STYLE F

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

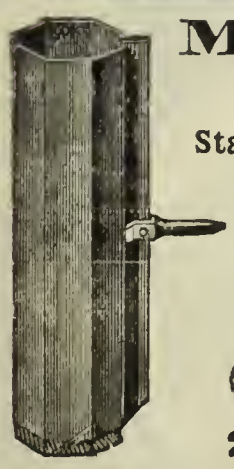
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,

(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.

The "O.H." One Piece

PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

(PATENTED OCT. 25, 1892.)



For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

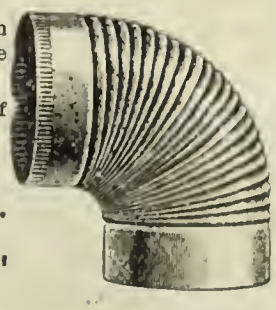
3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.

For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.



THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR.

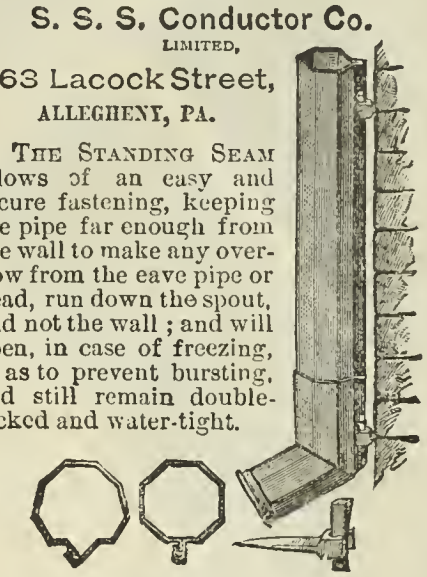
MANUFACTURED BY THE

S. S. S. Conductor Co.

LIMITED,

163 Lacock Street,

ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.

THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,

19 & 21 E. South St.,

INDIANAPOLIS, IND.

4-inch sample, by mail, 40 cts. in stamps.

4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 39th Street, NEW YORK.

LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order.

PATENTED

LONGEST EAVE TROUGH IN THE WORLD 10 FT. WITHOUT A SEAM.

PRESSED STEEL BRICK

COMPLETE GALVANIZED STEEL FRONTS

ROCK FACE BRICK AND STONE

CONDUCTOR

CORRUGATED IRON

NO SIR! YOU CAN'T SELL ME YOUR ROOFING! I AM USEING BERGER'S PATENT, IT IS THE BEST IN THE MARKET, AND YOU KNOW IT."

BERGER'S PATENT ROOFING

CRIMPED IRON

PLAIN ROUND

FIRE PROOF DOORS & SHUTTERS

METALLIC SHINGLES

CONDUCTOR

EXPANDING

PATENT CEILINGS

25 STYLES

CORNICES AND FINIALS

PERFECTION WATER CUT-OFF

PERFECTION WIRE HANGER

IMPERIAL STEEL HANGER

SKYLIGHTS

ALL STYLES

132 PAGE Catalogue ON APPLICATION.

WRITE FOR PRICES IT WILL PAY YOU.

THE BERGER MFG. CO. CANTON, O.

IRON AWNINGS, ROOF PAINTS, WEATHER VANES, VENTILATORS, MALLEABLE IRON CRESTINGS, etc.

WESTERN AGENTS: ILLINOIS ROOFING & SUPPLY CO. CHICAGO, ILL.

SPECIALTIES.

BRIGHT TIN PLATE.
GUMMEY'S ANTI-PINHOLE.
TERNE PLATE.
ALDERLY EXTRA QUALITY.
PENNSYL OLD METHOD, Treble Coated.
GILBERTSON'S OLD METHOD, Treble Coated.
Sheet Copper.—Brazier's Cold Rolled & Polished.
CRAIG SHEET STEEL.
COLD ROLLED SHEET IRON.
" " " SOFT STEEL.
CORRUGATED IRON.
" CONDUCTOR PIPE.
SPIRAL PIPE. REGISTERS.
ROOFING PAPER, No. 9.— 500 Square Feet per Roll.
" " No. 13.— 800 Square Feet per Roll.
ROOFING PAINT.
" TIN IN ROLLS.
100 Square Feet.
20 in. and 28 in. Wide.
Painted One Side.
ASBESTOS FIRE PROOF SHEATHING PAPER.
PECORA ROOFING CEMENT.
PLASTERING WIRE.

GUMMEY, SPERING & CO.,
PHILADELPHIA.

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk.
Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. BRIDGEPORT, OHIO.

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,
535 to 547 West 15th Street, New York.

NEW CASTLE

AMERICAN
BRIGHT TIN AND TERNE PLATES
Made at our Extensive Works
direct from
LAKE SUPERIOR ORES.
Equal to the "Best in the World,"
If you don't believe it send for samples.

New Castle Steel and Tin Plate Co., New Castle, Pa.

THE PHILLIPS TIN PLATE CO., Philadelphia, Pa.
"F. R. P. EXTRA." Treble coated Oil Finish. Guaranteed to carry 45 lb. coating.
"PHILLIPS ROOFING." Extra heavy. Bright finish. " " 35 lb. "
"BOSTON." Heavy Spangled Terne. Guaranteed to carry 20 lb coating.
"NATIONAL." (Worcester grade.) " " 10 lb. "

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

Pontymister Old Style Ternes

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS.** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade:

TIN AND IRON SHOW CARDS.

110 John St., - New York.

ALAN WOOD COMPANY,

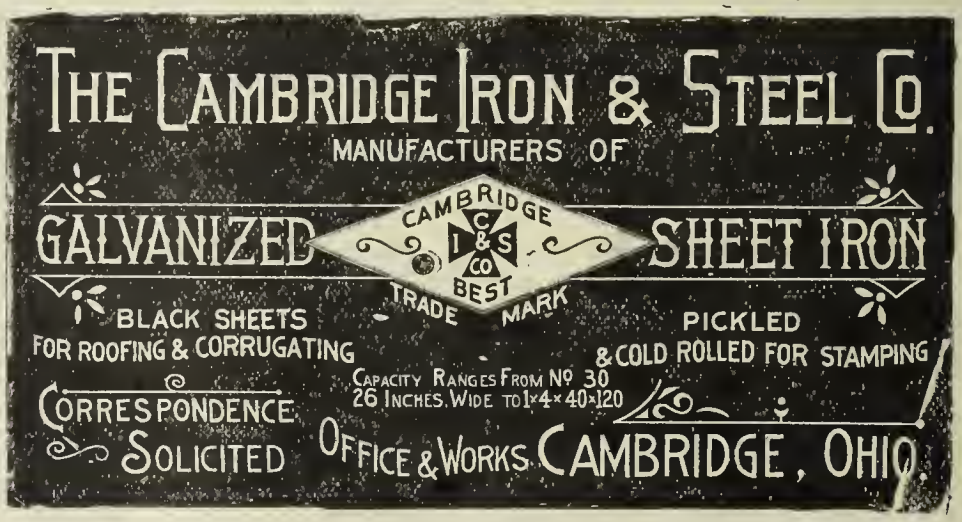
MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.



ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

MONARCH OLD PROCESS

ROOFING PLATES

Have been on the market for ten years and have never varied from their high standard of quality.

P. B. CALVERT & CO.,

Write for Prices. Philadelphia, Pa.

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

TRADE-MARK AMERICAN RG CLEANED.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty*

Buy Plain and Corrugated Conductors and Single and Double Beaded Eave Troughs, all in 10 ft. lengths; also Brick Siding, Corrugated Roofing, Cornices, &c., of

ALLEN'S CORRUGATING WORKS,

422 and 424 W. Randolph St., CHICAGO, ILL.

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

—MANUFACTURERS OF—

SHEET METAL ROOFING, SIDING AND CEILING

—OF ALL DESCRIPTIONS FROM—

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.

Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.

Factory, 113 to 133 Soulard Street, ST. LOUIS, MO.

ROOFING SLATE.

OUR BANGOR UNION, ALBION & MAMMOTH VEIN QUARRIES

PRODUCE THE FINEST SLATE IN PENNSYLVANIA & VERMONT

HAND SHAVED BANGOR SLATE BLACK BOARDS

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS

AULD & CONGER, 100 EUCLID AVE., CLEVELAND, OHIO.

Light

AND

Medium Weight

GRAY IRON CASTINGS.

WE SOLICIT CORRESPONDENCE WITH THOSE WHO USE THE ABOVE.

We claim to have few equals and no superiors in quality.

We have unusual capacity. Two seven-foot cupolas.

The Taylor & Boggis Fdy. Co.

523 Seneca St., Cleveland, O.

— NEW TACTICS.—At the session of the school for non-commissioned officers of one of the companies stationed at Fort Wayne, the following question was asked of Sergeant —— :

"What is strategy? Give me an instance of it."

After studying for a moment or two the sergeant gave the reply:

"When in battle and you are out of ammunition and don't want the enemy to know it, it is good strategy to keep right on firing."—*Exchange.*

— CAUGHT IN THE CURRENT.—"You know the fish hook is the cause of many sinful, awful yarns?"

"Yes; it's a nuisance—something to a-bait."—*Atlanta Journal.*

Standard Books
—ON—
FOUNDRY PRACTICE.

The Encyclopedia of Founding and Dictionary of Foundry Terms,

used in the practice of molding. Together with a description of the tools, mechanical appliances, materials, and methods employed to produce castings in all the useful metals and their alloys, including brass, bronze, steel, bell, iron and type founding, with many original mixtures of recognized value in the mechanic arts. Also aluminum, plating, gilding, silvering, dipping, lacquering, staining, bronzing, tinning, galvanizing, britannia-ware, German silver, nickel, soldering, brazing, ores, smelting, refining, assaying, etc. By SIMPSON BOLLAND, Author of "The Iron Founder," "The Iron Founder" Supplement. 12mo.: cloth.....**$3.00**

The Pattern Maker's Assistant

Embracing lathe work, branch work, core work, sweep work and practical gear constructions, the preparation and use of tools, together with a large collection of useful and valuable tables. Sixth edition. By JOSHUA ROSE, M. E.; illustrated with 250 engravings; 324 pages: cloth.....**$2.50**

Modern Molding and Pattern Making.

A practical treatise upon pattern shop and foundry work. By JOSEPH P. MULLIN, M.E.: 257 pages; cloth; illustrated. **$2.50**

Iron and Steel Founding.

Illustrated with 39 diagrams. By C. WYLIE. Second edition, revised and enlarged; 324 pages; 8vo; cloth... .....**$2**

The Practical Brass and Iron Founder's Guide.

A treatise on brass founding, molding, the metals and their alloys, etc. By JAMES LARKIN, late conductor of the brass foundry department in the Penn Works, Philadelphia. A new revised and greatly enlarged edition. Contents: Among the most important and entirely new sections of this edition of this valuable and popular book are the following: Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitls Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to Other Metals; Casting Iron and Other Metals Upon Lace, Embroideries, Fern Leaves and Other Combustible Materials; Some Modern Bronzes. In one volume; 12mo; 400 pages.....**$2.50**

American Foundry Practice.

Treating of loam, dry sand and green sand molding, and containing a practical treatise upon the management of cupolas and the melting of iron. By THOMAS D. WEST, practical iron molder and foundry foreman. Fully illustrated. Eighth edition, revised. 408 pages; cloth.....**$2 50**

The Iron Founder.

A comprehensive treatise on the art of molding, including chapters on core-making, loam, dry sand and green sand molding, also crystallization, shrinkage and contraction of cast iron and a full explanation of the science of pressures in molds, added to which are formulas for mixtures of iron, tables, rules and miscellaneous information. By SIMPSON BOLLAND. Illustrated with over 300 engravings. 12mo, cloth....**$2.50**

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings, wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. Illustrated with over 200 engravings: 400 pages; 12mo: cloth..... ...**$2.50**

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96-102 Reade St., New York.

Bright Charcoal Tin Plates.

Coke Tin Plates.

A Full Assortment of Sizes.

ALSO

20 x 28 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	LILY—Stamped and Squared.
IC	DYFFRYN,
IC	WORCESTER.
200 lbs.	WORCESTER.
IC	W T R—Stamped.
200 lbs.	W T R.
IC	P T L.
IC	DEAN
200 lbs.	DEAN.
IC	PETREL.
200 lbs.	PETREL.
IC	ALYN.
IC	BAAN.
IC	MANSEL.
IC	ALBAN.
200 lbs.	ALBAN.
190 lbs.	ALBAN.
200 lbs.	CAWDOR.
190 lbs.	CAWDOR.

14 x 20 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F—Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	W T R—Stamped.
100 lbs.	W T R.
IC	P T L.
IC	DEAN.
100 lbs.	DEAN.
IC	PETREL.
100 lbs.	PETREL.
100 lbs.	CAWDOR.
IC	BAAN.

WASTER ROOFING.

ICW	20x28	GWERNEN.
ICW	"	W T R.
200 lbs. W	"	ALBAN.
190 lbs. W	"	ALBAN.
180 lbs. W	"	DYFFRYN.

SOLDER—The reduction in Pig Tin has made prices much lower.

RUSSIA SHEET IRON (Genuine)—The duty has been reduced, and prices are lower than last year. No. 8 to No. 16 inclusive, sheets 28x56 inches.

BRUCE & COOK,

190 Water St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. Brooklyn, N. Y.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.
Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, • • EASTON, PA

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC. QUARRIES, BANGOR, PA. NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE Kitchen Sinks, Laundry Tubs, Washstand Tops, Marbleized Shelves, Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also Mantels.

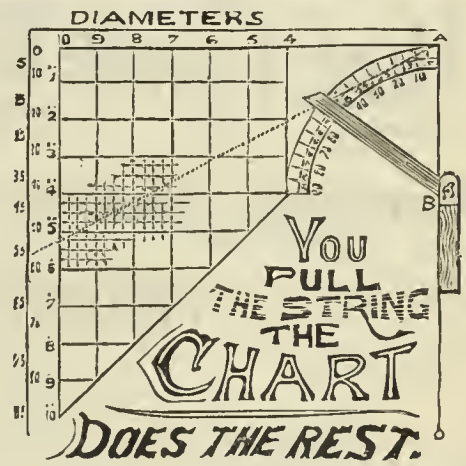
FAIRHAVEN, VERMONT.

SEND FOR CATALOGUE.

At this time of the Year

metal workers are busy fixing furnaces, steam pipes, etc. Dixon's Graphite Pipe Joint Grease will make a better joint than red or white lead and parts can be separated easily even years after. When used on valves it does not harden or cause the valves to stick. Send for circular and sample.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.



ELBOW PATTERN CHARTS.

Quick method. Easy to learn. Good to have. Over 1000 sold. 50c. by mail.

A. L. BURTIS, Lockport, N. Y.

THE ROOT & BARRON ELASTIC ROOF CEMENT.

A root cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer,
PALMYRA, NEW YORK.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds.



PATENTED JANUARY 3, 1894

Merchant's Graduated "Spanish" Tiles

FOR CONICAL TOWERS DOMES ETC.
COPPER TIN OR STEEL

SPECIAL GLAZED TILE
OF ANY COLOR
MADE TO ORDER

Full information Given with prices on application

Ornamental and Durable

The "Star" Ventilator

ABSOLUTELY STORM-PROOF

For Ventilating Theatres, Churches, School-Houses also Mills of all kinds, Stables Etc

WRITE US FOR A COPY OF OUR BOOK ON VENTILATION



PATENTED MARCH 30, 1886

High Grade Roofing Tin

EVERY SHEET STAMPED WITH BRAND AND THICKNESS

"Merchant's Roofing" EXTRA HEAVILY COATED

ABSOLUTELY NO WASTERS

"Alaska" HEAVILY COATED

CHICAGO NEW YORK

MERCHANT & CO
INCORPORATED
SOLE MANUFACTURERS
PHILADELPHIA

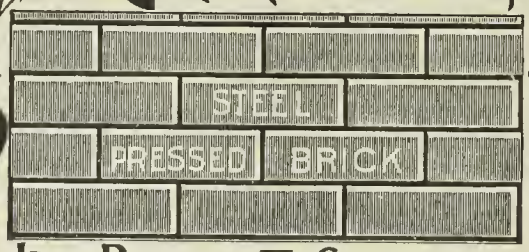
BROOKLYN LONDON

BEWARE! OF INFRINGMENTS.

..Purchase only the..

Genuine Pressed Steel Brick





PATENTED APRIL 5th 1887.

Corrugated Steel CEILINGS

THE PENN IRON ROOFING AND CORRUGATING Co LIMITED.

For Catalogue, Samples and Prices. 23rd & HAMILTON Sts PHIL'A, PA. U.S.A.

METAL CEILINGS

Suitable for Residences, Offices, Stores, Schools, Hospitals & Churches

Can be applied over old Plaster Without removing same

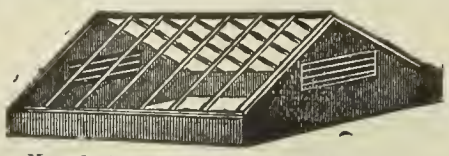
Send for Catalogue & Prices

Give Measurements or estimate

N.Y. METAL CEILING CO. LIMITED

21ST ST. AND 13TH AVE. NEAR 23RD FERRY NEW YORK, N.Y.

RASNER & DINGER



Manufacturers of HAYES' PATENT

Metallic Sky-Lights,

Galvanized Iron Cornices and all kinds of Architectural Sheet Metal Work, Tin and Iron Roofers.

Second Ave. & Ferry St., Pittsburgh, Pa

Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10 inches, Cloth. Price, $3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

CONTENTS:

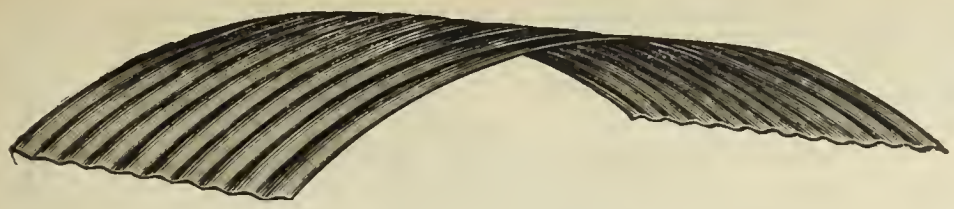
Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Sauce pans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS,

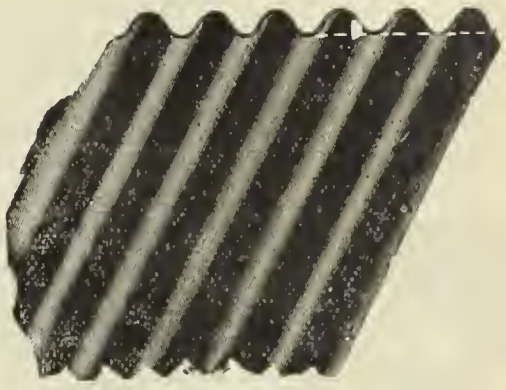
Publisher,

96-102 Reade St., NEW YORK.



Curved and Corrugated

Sheets for Structural Purposes



Any size and dimension, ready for placing in position without trimming. Lightness, strength and durability insured at a minimum cost.

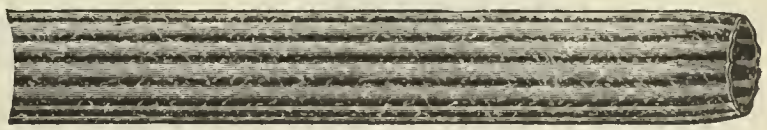
Such as
Houses,
Barns,
Factories,
Warehouses,
Granaries,
Sheds, Etc.

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.

CONDUCTOR



ELBOWS,
FINIALS,
CRESTINGS,
HANGERS,
STEEL ROOFING,
IRON ROOFING,
EVERYTHING.



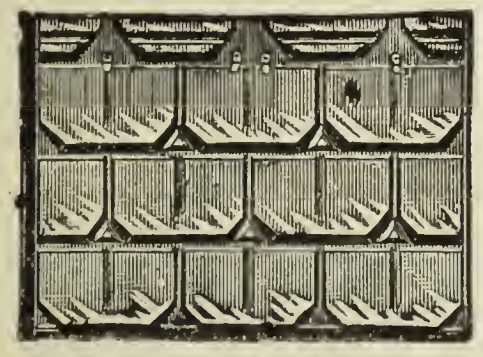
PIPE

Cheaper! Better! Easier to put up than any other. A full ine of Roofing and Tinners' Sheet Metal Supplies are made by us. Get our prices and make money.

RHODES, DICKELMAN & CO., Forest, O.

THE FAVORITE METAL SHINGLE

EASTLAKE



MONTROSS PATENT.

Gothic and Diamond Tile.

Unequaled for beauty and excellence.

SEND FOR CIRCULAR.

W. J. Burton & Co., - - - - Detroit, Mich.
Montross Metal Shingle Co., - - Camden, N. J.
E. Van Noorden & Co., - - - Boston, Mass.

You can get everything in the line of Sheet Metal Goods from us.

PRICES WAY DOWN.

Steel Roofing, Corrugated Iron.

Galvanized Steel Eave Trough, Corrugated Expanding Conductor, Galvanized Cornice, Ornamental Crestings, Finials, Etc.

DOWN! DOWN! GO PRICES. WRITE US QUICK.

J. H ELLER & CO., Office, 194 E. Fifth St., CANTON, OHIO.

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price, 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.

AMERICAN ROOFING CO.,

ST. LOUIS and CINCINNATI.

Mention this paper.



James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

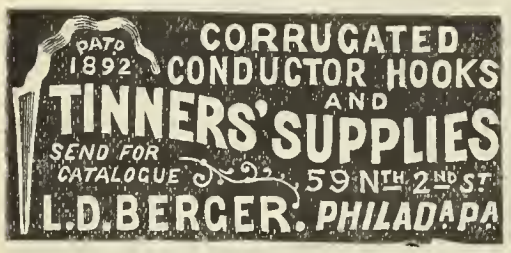
MANUFACTURERS



FOR

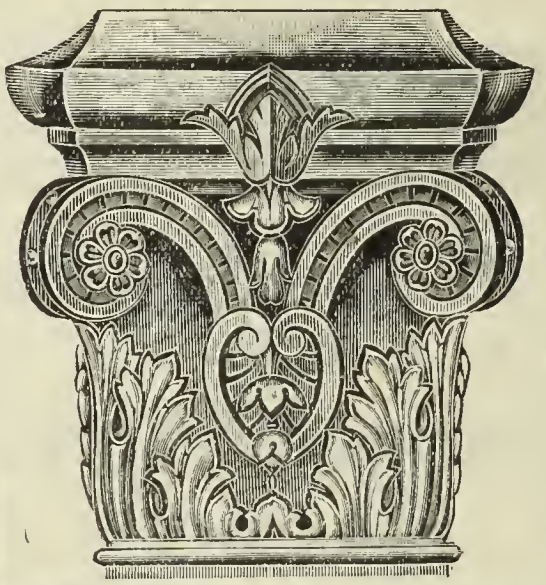
ROOFING AND SIDING.

Send for Circular and Prices.



JOHN SANBORN,
Dealer in Metals,
and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 WATER STREET,
Beekman Street, NEW YORK.

FRIEDLEY & VOSHARDT, 194 & 196 MATHER ST. Chicago, Ill.



MANUFACTURERS OF

Sheet Metal, Zinc and Copper Ornaments

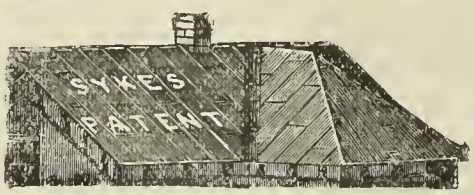
FOR

Interior and Exterior Work, Steel Ceilings, Statuary, &c.

Send for our new 1894 Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.





WORLD'S FAIR AWARD.

We are the only Steel Roofing Co. awarded Meda and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - Chicago and Niles, O.

RISING & NELSON,

WEST PAWLET, VT.

MANUFACTURERS OF

RED and GREEN ROOFING SLATE.

Wholesale Dealers in all kinds of Roofing Slate.

CORRESPONDENCE SOLICITED.

— REVISED.—"So you want to marry my son," said the stern mamma to the Emancipated Woman.

"I do."

"Can you support him in the manner in which he has been accustomed?"

"I can."

"Then take him and be happy."—*Life.*

— JAGWELL: "I've made an awful mistake: I sent a messenger boy up to Miss Cashley's with a lot of flowers, thinking it was her birthday, now I learn that her birthday is to-morrow."

Wigwag: "That's all right; the messenger boy may get there in time."—*Philadelphia Record.*

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

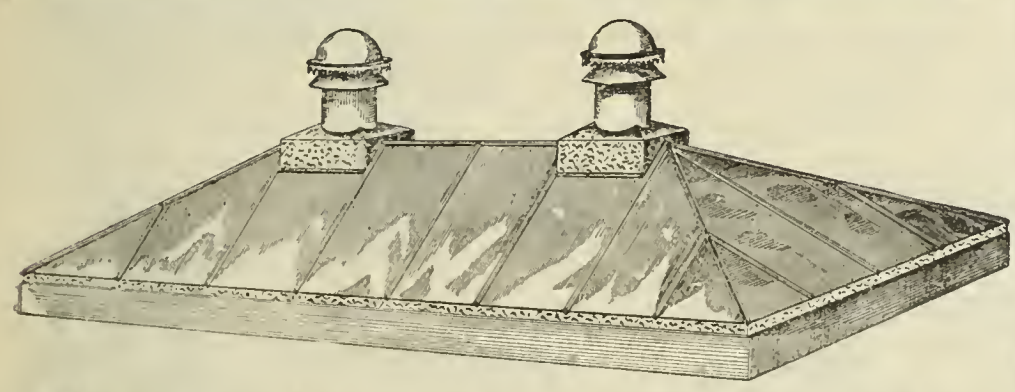
Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.





Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole



Full Size. CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. **LITTLEFORD BROS.,** SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O

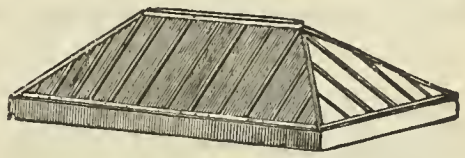
JAMES A. MILLER & BRO.

129 and 131 So. Clinton St.,

CHICAGO.

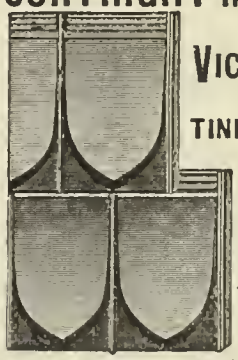
MANUFACTURERS OF

Sheet Metal Skylights.



The amount of skylight work we did for the World's Fair (over 600,000 sq. ft.) required us to so increase our facilities for such work that we have cheapened the cost materially, and we will be particularly pleased to quote prices for large or small skylight work, "knocked down" or put together, as preferred.

CORTRIGHT METAL SLATES



and

VICTORIA SHINGLES

Made of

TINPLATE, (Full Weight Only)

Galvanized Steel

and

COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office, 134 Van Buren Street, Chicago.

Defy Fire and Time

WITH OUR

Steel Roofing,

Steel Ceilings, (Patented)

Corrugated Iron, Conductor Pipes,

Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,

Office and Works, Wheeling, W. Va.
Office and Warehouse, 474 Laflin St., Chicago.
Office and Warehouse, 81 Fulton St., New York.

DUGAN'S PATENT

SNOW GUARDS FOR SLATE AND OTHER SLANTING ROOFS

SEND FOR ILLUSTRATED CIRCULAR & PRICE LIST.

M. HALLIDAY,

SOLE PROPRIETOR AND MANUFACTURER.

218 EAST NINTH STREET, NEW YORK.

Architectural
Sheet Metal
Work.

Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.



59 N. 2d STREET, - PHILADELPHIA, PA.



Hicks' Guide

FOR

Builders,

Comprising an easy, practical system of Estimating Materials and Labor for Carpenters, Contractors and Builders.

A comprehensive guide to those engaged in the various branches of the building trades.

By I. P. HICKS.

160 Pages, - 114 Illustrations.

Bound in Cloth, Price, - $1.00

This book presents to the trade, first, an easy, practical system of estimating materials, in concise form for reference. In the next place is given the average day's work of all kinds, and the average rates on which to figure in almost every detail of building construction.

Material and Labor, including Lumber, Carpentry Work Masonry, Plastering, Hardware, Painting, etc., are among the principal divisions. These in turn are illustrated and ably treated under numerous sub-divisions, showing step by step the entire work of estimating, contracting and building, together with the best and most practical methods of doing the work.

This is followed by a section given to the Geometrical Measurements of Roof Surfaces, with numerous illustrations and examples. It embraces a new and simple system of framing curved roofs, also the simplest methods of roof framing of every description, with practical examples thoroughly illustrating nearly every conceivable form of roof and showing many points never before presented.

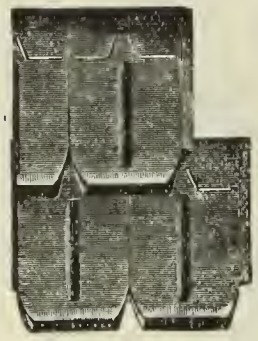
The volume also contains a chapter on Mitering Planceers, Moldings, etc., illustrating and describing how to make, in an easy, practical manner, many joints which are the source of no little trouble and annoyance on the part of the workman.

SENT POST-PAID BY

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade St., N. Y.

H ORN'S PATENT METALLIC ROOFING



TILES AND SPRING-LOCK SHINGLES.

THE BEST, MOST HANDSOME, DURABLE AND SECURE ROOFING PLATES YET OFFERED TO THE BUILDING TRADE.

Indorsed by All the Leading Architects.

Our system differs from all others in existence. We keep a complete stock of *eight designs of tile and two sizes of shingles.* Our tiles are a marvel of beauty and have the most secure and most practical side-lock ever invented.

Send for illustrated catalogue and circular.

THORN SHINGLE & ORNAMENT CO.,

1221 Callowhill St., Philadelphia, Pa.

Send for a descriptive circular, with sample pages, of the METAL WORKER PATTERN BOOK. Even if you are not ready to buy, you want to know just what kind of book it is and how it would help in your work. DAVID WILLIAMS, Publisher, 96 - 102 Reade Street, New York.

TINNERS' MACHINERY AND SUPPLY CO.,

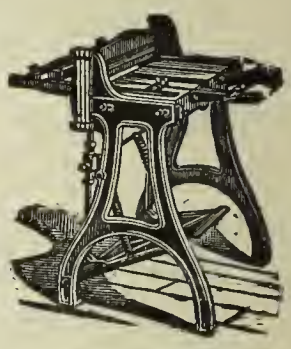
SUCCESSORS TO

HIBBERD & SPINNER,

9 CLIFF STREET, - NEW YORK CITY.

Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery. Presses, Dies and Can Makers' Tools.

FULL LINE OF SUPPLIES.



PATENT AUTOMATIC CAN BODY SEAMERS.

COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.

218 New St.,

W. J. GORDON, PHILADELPHIA, PA.

POCOCK'S ECCENTRIC

FORMING MACHINE.



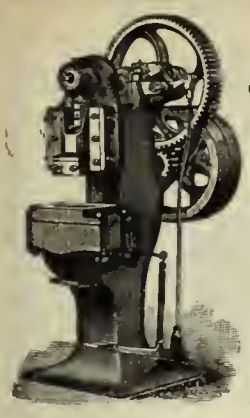
We invite your attention to this new Former for Tinners' and Sheet-Metal Workers' Rolls, on which we claim rapidity of operation, superior construction and durability. The back roll is moved by eccentrics instead of screws, and can be changed instantly from the smallest circle to the passing of a straight sheet. It will flare metal easier and better than any other machine in use. You can get closer to front roll, therefore bend a smaller circle. For sale by all leading jobbers. Send for circular to

O. POCOCK, Mfr.
363, 365, 367 Clark St.
CINCINNATI, OHIO.

3-inch Rolls with Slip Rolls a specialty

NIAGARA

Tools and Machines for Sheet Metal Workers.



Power Punching Press.

Tinsmiths' Tools,

A FULL LINE.

THE BEST AND MOST IMPROVED

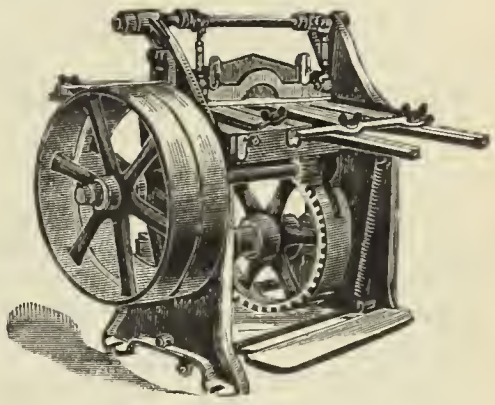
ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

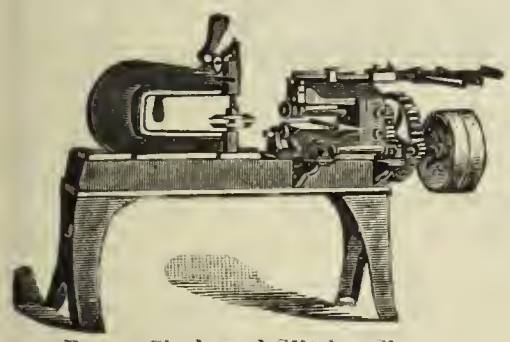
CORNICE MAKERS' TOOLS.

PRESSES AND DIES

SQUARING, SLITTING and CIRCLE SHEARS.



Geared Power Squaring Shear.



Power Circle and Slitting Shear.

Complete Outfits for making Tinware, Cans and Other Sheet Metal Goods.

—MANUFACTURED BY—

THE NIAGARA STAMPING & TOOL CO.,

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**

A FEW SPECIALTIES.

—MADE BY—

BERTSCH & CO.,

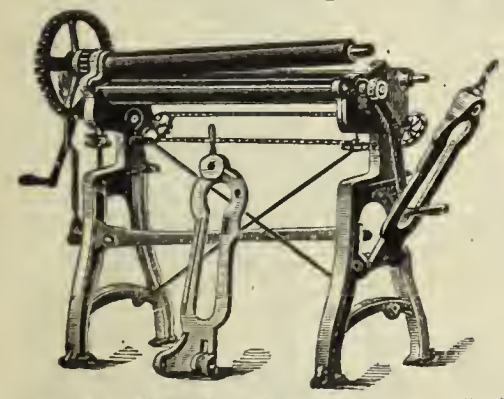
CAMBRIDGE CITY, IND.,

Who would be glad to have you write for Estimates, etc.



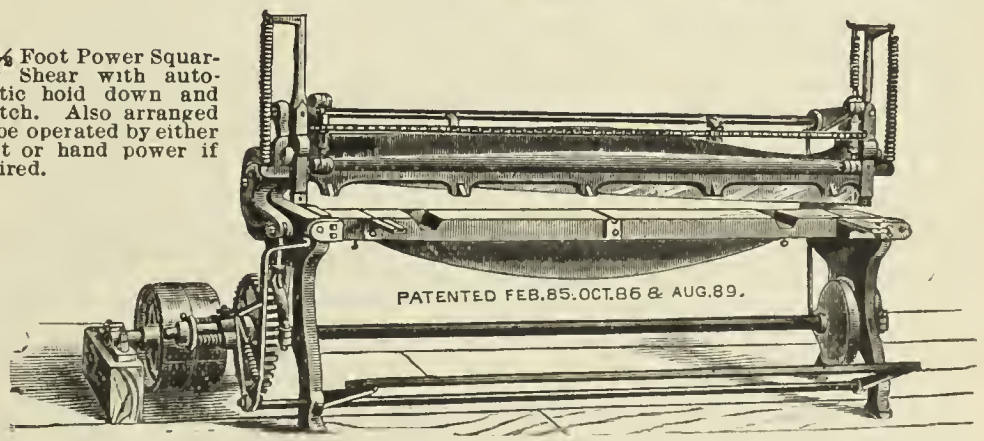
Punch and Stock Shear.

Improved Patent Combined General Purpose Punch and Stock Shears. (7) different sizes for light or heavy work for trimming and slitting sheets as desired; also round or flat bars, &c., Provided with two levers, also lever stock shears and lever punches separate, and power punches.

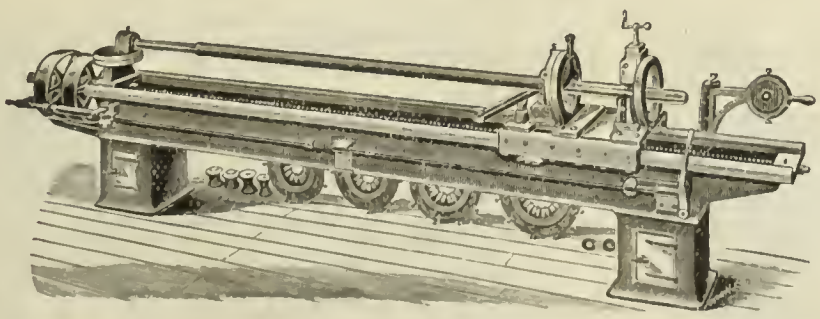


New Patent Self Opening and Closing Quick Adjustable Slip Roll Formers. A revolution in quickness and ease of adjustments, and opening the roll in one operation in elevated position as shown to remove the metal. All sizes, from 2 in. to 12 in. rolls for large plates. Also similar Crimping or Corrugating Rolls, Improved Plate Straightening Rolls, and Tools for working Sheet Metal. Notice this space next week.

8½ Foot Power Squaring Shear with automatic hold down and clutch. Also arranged to be operated by either foot or hand power if desired.



Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

— THE BORE narrating drowning accident: "And all this happened in less time than it bas taken me to tell it."

Tired Listener: "If it hadn't the man could have been rescued."—*Exchange.*

—HAUTEUR.—"Are you used to serving roast beef rare?" said the lady who was endeavoring to learn whether she suited the new cook.

"No, ma'am," was the loftily spoken reply. "Up to me prisent employment, Oi've been used to serving it frequent."—*Washington Star.*

— HYGIENIC DIETING.—The Old Housekeeper: "Why do you make some of your dumplings large and others small?"

The Young Housekeeper: "Because the doctor advises a variety in our diet."—*Exchange.*

— ONE of the regulations of the West Boston Bridge Company reads: "And the said proprietors shall meet annually on the first Tuesday of June, provided the same does not fall on a Sunday."—*Exchange.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

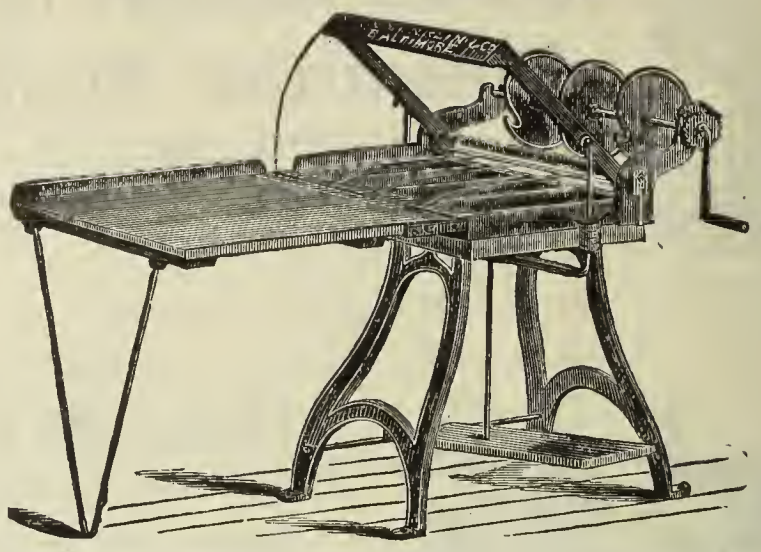
Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE,

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

First, for Rapidity of Work.
Second, for Quality of Work.
Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

LYON, CONKLIN & CO.,

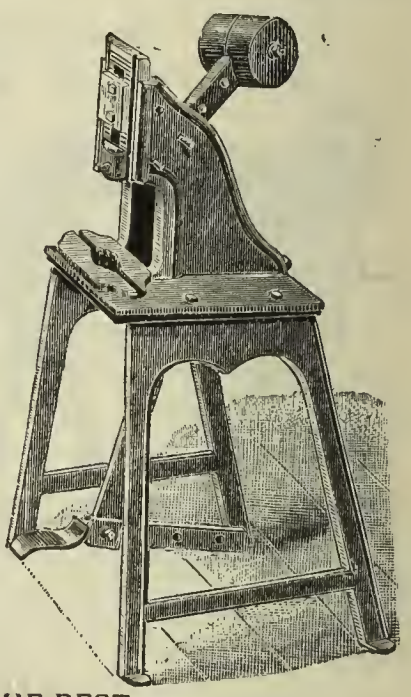
Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.

—OUR—

PENDULUM PRESSES

are suitable for a wide range of work. Grooved beds with sliding bolts for holding all sizes of dies. Perfectly fitted balanced, and adjustable to light and heavy blows. A first-class machine in every respect.



MANUFACTURED BY

G. A. Crosby & Co.,

176 & 178 So. Clinton St., CHICAGO, ILL., U. S. A.,

DESIGNERS AND BUILDERS OF

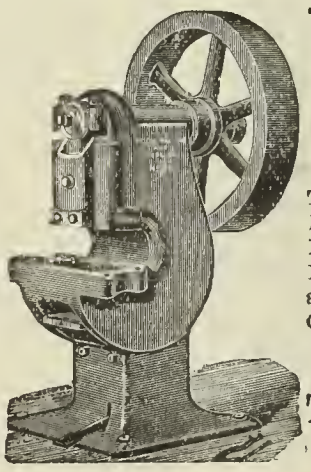
Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap and Boiler Makers, and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Wire Goods, Brass Goods and all Hardware Novelties.**

Special Attention to Dies of every Description.

WORK GUARANTEED THE BEST.

Write for Prices and Our New 200-Page Catalogue.,

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.



The Toledo Machine & Tool Co.,

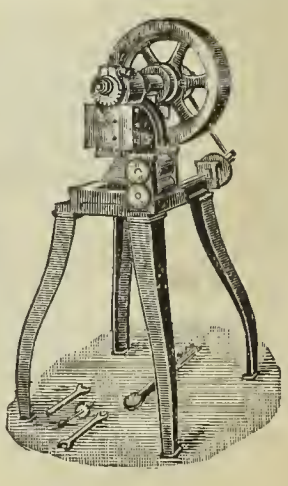
MANUFACTURERS OF

Power Punching Presses, Drop Presses Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

Send for Catalogue now being Printed.

The Toledo Machine & Tool Co.

Superior and Oak Sts., Toledo, O.



ALPHABETICAL LIST OF ADVERTISERS.

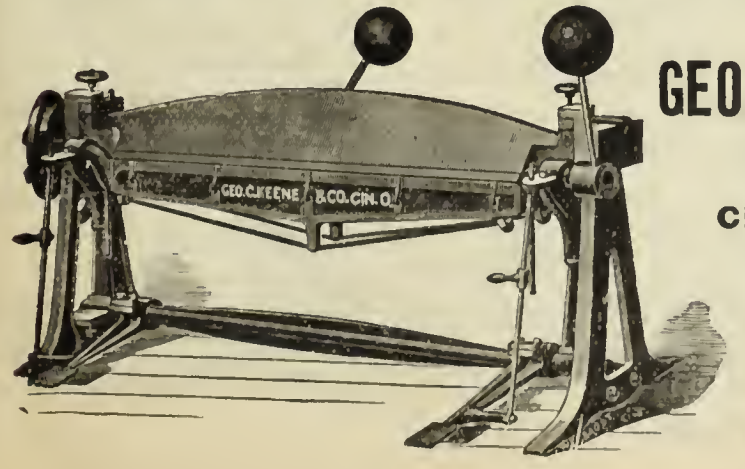
Acme Roofing Co..... 86
Ætna Standard Iron & Steel Co..... 79
Allen's Corrugating Wks... 81
American Boiler Co..... 19
American Radiator Co..... 1
American Roofing Co..... 86
American Sheet Iron Co..... 81
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 75
Auld & Conger..... 81
Bailey-Farrell Mfg. Co..... 74
Bangor Excelsior Slate Co.. 83
Barstow Stove Co..... 96
Bascom, H. Clay.. 71
Belden, F. E. Mica Mining Co..... 27
Belding Mfg. Co.....28&29
Bellaire Stamping Co..... 67
Berger Bros..... 76
Berger, L. D.....86&88
Berger Mfg. Co..... 78
Bertsch & Co..... 89
Bihb, B C. Stove Co..... 23
Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 27
Bowen Mfg. Co..... 31
Bower, B. P. & Co..... 74
Bowers, Galpin & Co..... 77
Braner, A. G..... 71
Bridgeport Crucible Co..... 70
Bromhacher's Sons, Jacob.. 95
Bronson Supply Co..... 69
Bruce & Cook.....82&96
Buffalo Register Works..... 63
Burtis, A. L..... 83
Burton, W. J. & Co..... 85
Calely, Ed. L..... 71
Calvert, P. B. & Co..... 81
Cambridge Iron & Steel Co.. 80
Canfield, H. O..... 76
Canton Steel Roofing Co..... 88
Carton Furnace Co..... 3
Central Oilgas Stove Co..... 10
Central Stamping Co..... 66
Challenge Corn Planter Co.. 30
Chamberlain, J. W. Co..... 75
Cheney, S. & Son..... 70
Chicago & Erie Stove Co..16&18
Cincinnati Corrugating Co.. 85
Clark, G. M. & Co..... 12
Clark Novelty Co..... 74
Clark, Quien & Morse..... 77
Clayton & Lambert Mfg. Co. 73
Cleveland Gas Machine Co.. 73
Clough, R. M 91
Columbia Refrigerator Co.. 30
Colwell Lead Co..... 77
Connecticut Plating Co..... 70
Cooney, Selner & Co..... 77
Cope, Geo. W..... 71
Corning Mfg. Co. 23
Correspondence School of Mechanics..... 62
Cortright Metal Roofing Co. 87
Cory, U. & Co... 27
Covert Mfg. Co..... 65
Craig-Reynolds Fdy. Co..... 18
Crosby, G. A. & Co..... 90
Curtis & Curtis..... 74
Dalton-Ingersoll Co..... 72
Dangler Stove & Mfg. Co.... 11
Day Mfg. Co..... 72
Dayton Mfg. Co..... 14
De Haven & Co..... 15
Deming Co..... 74
Dixon, Jos., Crucible Co..... 83
Douglas, W. & B..... 74
Dover Machine Works..... 91
Dwight Slate Machine Co.... 95
Eckstein, Chas. G. & Co..... 94
Electric Boiler Co..... 23
Eller, J. H. & Co..... 85
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 83
Ferrosteel Co..... 14
Fostoria Steel Roofing Co... 87
Fox, Chas. F..... 65
Frink, I. P..... 96
Friedley & Voshardt..... 86
Froelich, A., Estate of..... 70
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 83
Garry Iron & Steel Roofing Co..... 87
Gender & Paeschke Mfg. Co. 68
Globe Iron Roofing & Corrugating Co..... 87
Globe Ventilator Co..... 71
Gobeille Pattern Co..... 71
Gordon, W. J..... 88
Gorton & Lidgerwood Co..... 1
Graff & Co..... 18
Grand Rapids Refrigerator Co..... 27
Greene, W. F..... 64
Griswold Mfg. Co..... 64
Gummey, Spering & Co..... 79
Gurney Heater Mfg. Co..... 19
Gurney Refrigerator Co..... 31
Halliday, M..... 87
Hamilton, John..... 96
Hart & Cronse..... 20
Hartford Hollow Ware Co.. 67
Haslet, Flanagen & Co..... 65
Hess, Snyder & Co..... 27
High land Foundry Co..... 1
Highton, Wm. & Sons..... 63
Holton Iron Roofing Co..... 86
Howard Furnace Co..... 32
Howard Thermostat Co..... 20
Howson & Howson..... 61
Illinois Refrigerator Co..... 30
Illinois Zinc Co..... 82
Iwan Bros..... 67
Jackson's Sons, W..... 20
Jenkins Bros..... 1
Jersey City Galvanizing Co. 75
Johnson, E. J. & Co 83
Kanneberg Roofing Co..... 76
Kansas City Metal Roofing & Corrugating Co..... 80
Keen & Hagerty..... 63
Keene, Geo. C. & Co..... 91
Kelly, Thos. & Bro..... 73
Kemp, C. M Mfg. Co..... 73
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 63
Kewanee Boiler Co..... 22
Kieckhefer Bros. & Co..... 66
Kieley, T..... 1
Kilbourne & Jacobs Mfg. Co. 72
Lawrence-Letts Elbow Co... 77
Lindemann, A. J. & Hoverson Co..... 24
Lindemann, J. P. & Sons.... 19
Littleford Bros..... 87
Lyon, Conklin & Co..... 90
McClure & Co..... 96
McDaniel & Harvey Co..... 82
McLaughlin, J. K..... 71
McLeod & Henry Co..... 70
Mahony, M..... 21
Marcy Stove Repair Co..... 70
Marlin & Co..... 77
Marston, I. G. & Co..... 71
Mason & Davis Co..... 13
Mason Regulator Co..... 1
Merchant & Co., Inc..... 84
Merry, Geo. E..... 79
Meurer Bros. Co..... 83
Mica Mfg. Co..... 27
Michigan Stove Co..... 17
Michigan Vapor Stove Co... 13
Millar, Chas. & Son... ... 96
Miller, Jas. A. & Bro....76,86&87
Miner & Peck Mfg. Co..... 94
Monarch Stove Co..... 8
Montross Metal Shingle Co.. 85
Mt. Penn Stove Works..... 15
Mowry, W. C..... 23
Mullins, W. H..... 87
Munsell, E. & Co... 31
Myers, F. E. & Bro..... 74
National Wringer Co..... 68
Newark Regulator Co..... 72
New Castle Steel & Tin Plate Co..... 79
New Haven Heating & Plumbing Co..... 19
New York Central Iron Wks. 22
New York Elbow Co..... 67
New York Metal Ceiling Co.. 84
New York Nickel Plating & Mfg. Co..... 67
Niagara Stamping & Tool Co. 89
Niles Mfg. Co..... 68
Obdyke, W. A. & Co..... 76
Obermayer, S. Co..... 70
Ohl, Geo. A. & Co 94
Osborn, J. M. & L. A..... 66
Ostrander, W. R. & Co..... 64
Page Boiler Co., Wm. H..... 20
Palermo Mica Co..... 27
Pancoast, Henry B. & Co.... 75
Paxson, J. W. & Co..... 70
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 74
Penn Iron Roofing & Corrugating Co..... 84
Perry Stove Co..... 5
Phelps, Dodge & Co 80
Phillips Tin Plate Co..... 79
Pocock, C..... 88
Pontyminster Old Style Ternes..... 80
Poorman Mfg. Co..... 89
Portsmouth Stove & Range Co..... 16
Preshrey Stove Lining Co... 71
Putnam Foundry & Machine Co..... 20
Rasner & Dinger..... 84
Rathbone, Sard & Co..... 26
Republic Iron Works, ... 81
Rhodes, Dickelman & Co.... 85
Ringen Stove Co..... 2
Rising & Nelson..... 86
Robinson, J. M. & Co..... 95
Rochester Stamping Wks.... 67
Rome Mfg. Co..... 71
Root, A. L..... 83
Rutland Fire Clay Co..... 71
St. Louis Corrugating Co.... 81
St. Louis Stamping Co..... 69
S S. S. Conductor Co..... 77
Salem Nail Co..... 83
Sanhorn, John. 86
Sandwich Novelty Co. 63
Saunders' D. Sons..... 7
Savill, Walls & Co..... 75
Sayre Stamping Co..... 64
Schaffer, J. P..... 22
Schneider & Trenkamp Co.. 9
Severing, John..... 76
Shepard, Sidney & Co..... 65
Sheppard, Isaac A. & Co..... 1
Silver & Co 69
Sims Mfg. Co. 75
Smith & Winchester Co..... 20
Smith Co., H. B..... 22
Smith, J. D. Foundry Supply Co..... 71
Souther, E. E. Iron Co..... 80
Special Notices..... 62
Sperry, D. R. & Co..... 69
Stamford Foundry Co..... 24
Standard Lighting Co.....6&7
Star Conpler Co..... 21
Star Mfg. Co..... 66
Stebbins, E. Mfg. Co..... 76
Steel Clad Bath Co..... 73
Stellwagen & Kynoch..... 65
Stiles & Parker Press Co ... 94
Stocking, E. B..... 61
Sykes Iron & Steel Roofing Co 86
Taplin, Rice & Co.. 16
Tarbox Mfg. Co.. 70
Taylor & Boggis Foundry Co. 81
Taylor Co., N. & G..... 96
Thatcher Furnace Co..... 21
Thorn Shingle & Ornament Co..... 88
Tinners' Machinery & Supply Co..... 88
Tinplate Decorating Co..... 80
Toledo Machine & Tool Co.. 90
Troy Nickel Works..... 31
Tuerk Water Meter Co..... 94
Tuttle & Bailey Mfg. Co..... 63
United States Heater Co.... 22
Valentine, M. D. & Bro. Co... 71
Van Noorden, E. & Co.. 85
Van Range Co., John..... 4
Vedder Pattern Works..... 71
Vogel, William & Bros..... 68
Walther & Christman..... 78
Washburne, E. G. & Co..... 71
Wayne, Jos. W..... 31
Weathered's, Thos. W. Sons 14
Wheeling Corrugating Co...87
Whitlock, W..... 75
Wisconsin Refrigerator Co.. 30
Wise, John & Son..... 67
Wister, L. & R. & Co..... 96
Wohler Aluminum Co 66
Wood, Alan Co..... 80
Wood Co., W. Dewees..... 96
Yates & Co..... 62
Zero Valve Co..... 73
Zucker, Levett & Loeh Co... 70

THE KEENE FOOT POWER

CORNICE BRAKE.

EASIEST TO OPERATE, STRONGEST AND BEST.

Sheet Metal Working Machinery of all Kinds.



GEO. C. KEENE & CO.,

Cincinnati, O.

AGENTS:

Hibberd & Spinner,
9 Cliff St., New York

Holder & Herrick,
49 Broad St., Boston, Mass.

Ledwidge & Co.,
234 Lake St., Chicago, Ill.

PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS, Dover, Del.

HAND LEVER PUNCH.

Operated by Toggle Joint.



Powerful, easy-working, low price. The best yet made. Send for descriptive circulars and price to

R. M. CLOUGH,

TOLLAND, CONN.

CLASSIFIED LIST OF ADVERTISERS.

Aluminum.
Shepard, Sidney & Co., Buffalo. N Y.
Wohler Aluminum Co., Chicago, Ill.

Architectural Ornaments.
Friedley & Vosbardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield H. O., Bridgeport, Conn,

Bathtubs.
Day Mfg. Co., Detroit, Mich.
Peck Bros., & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.
Stuart & Peterson Co., Phila., Pa,

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers Tools and Machines.
Bliss E. W. Co., Brooklyn, N. Y.
Crosby G. A. & Co., Chicago, Ill.
Dover Machine Works. Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y

Castings.
Cheney, S. & Son. Manlius, N. Y.
Taylor & Boggis Fdry. Co., Cleveland, O

Ceilings, Metallic.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Cement.
Bailey-Farrell Mfg. Co., Pittsburgb, Pa.

Chucks.
Whitlock, W., 39 Cortlandt St., N. Y.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing Co., Canton. O.
Allen's Corrugating Works. Chicago, Ill.
Berger Bros., Philadelphia, Pa. .
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton. Ohio.
Lawrence Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A., & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Corrugating Works, Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro. Chicago, Ill.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cuspidores.
Rochester Stamping Works, Rochester, N. Y.

Cut-Offs, Rain-Water.
Berger Mfg. Co., Canton, O.
Cooney, Selner & Co. Indianapolis,
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
E. W. Bliss Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct

Eave Troughs.
Berger. L. D., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Rhodes, Dickelman & Co., Forest, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill
Rhodes, Dickelman & Co . Forest, O.
Severding, Jno., Richmond, Ind.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
McLeod & Henry Co., Troy, N. Y.
Fresbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets:
Troy Nickel Works, Troy, N. Y.

Flour Bins and Sifters.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Foundry Facings, Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N, Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. O. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Craig-Reynold Foundry Co., Dayton Ohio.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Conn.
Thatcher Furnace Co., 240 Water St., N. Y.

Furnaces, Plumbers' and Tinners'.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis. Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front st., N. Y.

Groovers.
Tuerk Water Meter Co., Fulton, N. Y.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y
Poorman Mfg. Co., Canton, Ohio.

Heaters, Steam and Hot-Water.
American Boiler Co., Chicago, Ill.
Barstow Stove CO. Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Fuller & Warren Co., Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New Haven Heating & Plumbing Co., New Haven, Conn,
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Putnam Foundry & Machine Co., Putnam Conn.
Smith Co., H. B. 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass'
Thatcher Furnace Co., 240 Water St. N. Y.
United States Heater Co., Detroit, Mich
Weatbered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Stuart & Peterson Co., Philadelphia, Pa.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Shepard, Sidney & Co., Buffalo, N. Y.
Silver & Co., Brooklyn, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co. Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee. Wis.

Lamp Stoves and Heaters.
Central Oilgas Stove Co., Boston, Mass
Perry Stove Co., Albany. N. Y.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Vosbardt, Chicago, Ill.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Obermayer, S. Co., Cincinnati, Ohio.
Smith, J. D., Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating and Mfg. Co., 227 and 229 West 29th St., N. Y.

Oil Cans.
Central Oilgas Stove Co., Boston, Mass
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.
Lindemann, J. P. & Sons, Milwaukee, Wis.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Pattern Charts,
Burtis, A. L., Lockport, N. Y.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, Jno. K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Plating Co., Phila., Pa.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers Slate.
Fairbaven Marble & Marbleized Slate Co., Fairbaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa
Bower, B. P. & Co., Cleveland, O.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
Star Coupler Co., St. Louis, Mo.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher
Vogel, Wm. & Bros., 37 to 47 S. Brooklyn.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 45 Vesey St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water
American Radiator Co., Chicago, Ill.
Exeter Mch. Works, Boston, Mass.
Gurney Heater Mfg. Co. Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl Street, N. Y.

Refrigerators.
Belding Mfg. Co., Belding, Mich.
Bower Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co., Grand Haven, Mich,
Columbia Refrigerator Co., Northville, Mich.
Grand Rapids Refrigerator Co., Grand Rapids, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.
Illinois Refrigerator Co., Chicago, Ill.
Wayne, Jas. W., Cincinnati, Ohio.
Wisconsin Refrigerator Co., Eau Claire Wis.

Registers.
Buffalo Register Works Buffalo, N. Y.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St. N. Y
Silver & Co., Brooklyn, N. Y.
Wise, J. & Son, Butler, O.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel Corrugated and Plain.
Acme Roofing Co., Canton, O.
American Roofing Co., Cincinnati, O.
Berger Mfg. Co., Canton, O.
Bowers, Galpin & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, Ohio.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing and Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugating Co., St. Louis, Mo.
Souther, E. E. Iron Co., St, Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Conn.
Lyon, Conklin & Co., Baltimore, Md.
Pocock, O., Cincinnati, Ohio.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.
Rising & Nelson, West Pawlet, Vt.

SEE ALPHABETICAL INDEX, PAGE 91.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics Scranton, Pa.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 80 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co. Toledo, O.
Tuerk Water Meter Co., Fulton, N. Y.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Thorn Shingle and Ornament Co. Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.

Skate Sharpeners.
Sandwich Novelty Co., Sandwich, Ill.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.
Rasner & Dinger, Pittsburgh, Pa.

Slater's Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 293 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N. Y
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 7a Beekman St., N. Y.
Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son., Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Froelich, A., Estate of, 239 Pearl St., N. Y.
Marcy Stove Repair Co., 7a Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., City.
Troy Nickel Works Troy, N. Y.

Stove Trucks.
Fox, Chas. F., Dayton, Ohio.
Stellwagen & Kynoch, St. Ignace, Mich.

Stoves and Ranges.
Bibb, B. C., Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
DeHaven & Co., Pittsburgh, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co, Boston, Mass
Mason & Davis Co., Chicago, Ill.
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Rathbone, Sard & Co., Albany, N. Y.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Stamford Foundry Co., Stamford, Conn.
Tapiin, Rice & Co., Akron, O.
Thatcher Furnace Co., 240 Water St. N. Y.
Van, John, Range Co., Cincinnati, O.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Lindemann, A. J & Hoverson Co., Milwaukee, Wis.
Perry Stove Co., Albany, N. Y.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Central Oilgas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill,
Dangler Stove & Mfg. Co., Cleveland, O.
Dayton Mfg. Co., Dayton, Ohio.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Mich. Vapor Stove Co., Grand Rapids, Mich.
Monarch Stove Co., Mansfield, Ohio.
Perry Stove Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N.Y

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Bruce & Cook, 186 to 190 Water St. N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Gummey, Spering & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila., Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., N. Y.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Keen & Hagerty, Baltimore, Md.
Meckhefe, Bros. & Co. Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 80 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N. Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, George A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., Cliff St., N. Y.

Traps and Vents.
Bower, B. P. & Co., Cleveland, O.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Sonther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc. Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - -	$1.00	SIX MONTHS, - - - - - -	$22.10
ONE MONTH, (5 Times.) - - - -	5.00	ONE YEAR, - - - - - -	40.80
THREE MONTHS, - - - - -	12.35		

RATES FOR LARGER SPACES QUOTED ON APPLICATION.

DAVID WILLIAMS, Publisher,

96, 98, 100 and 102 Reade Street, NEW YORK. **59 Dearborn Street, CHICAGO.**

New York (Main Office), - - -	96-102 Reade Street. - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509, Hamilton Building, - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - -	HENRY SMITH, Manager.
St. Louis, - - - - - - -	Bank of Commerce Building, - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon St., London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe; or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A., The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

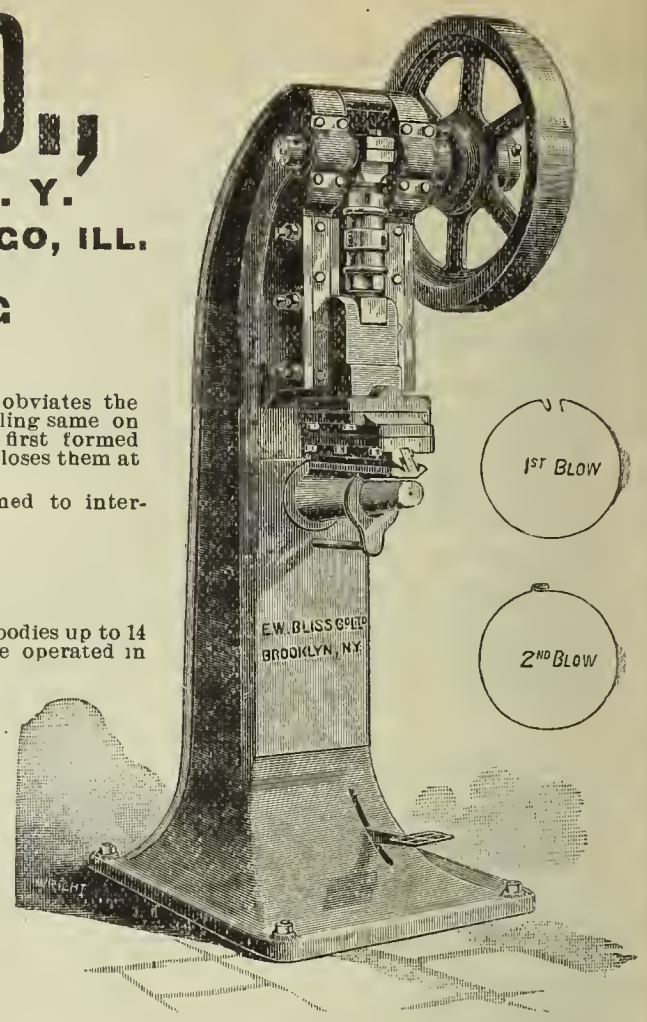
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.



PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

DIES, SPECIAL MACHINERY &c.

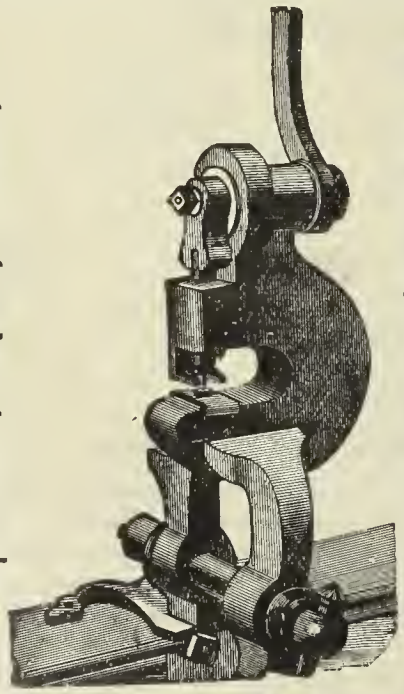
THE STILES & PARKER PRESS CO.

CHAS. G. ECKSTEIN & CO.,

45 Vesey St., New York.

Punches and Shears, Wrought Iron Ornaments, Mouldings, Rosettes, Fence Pickets, etc.

Compact Form, Simplicity, Durability.



Best Workmanship, Few Parts, Low Price.

SEND FOR CIRCULAR.

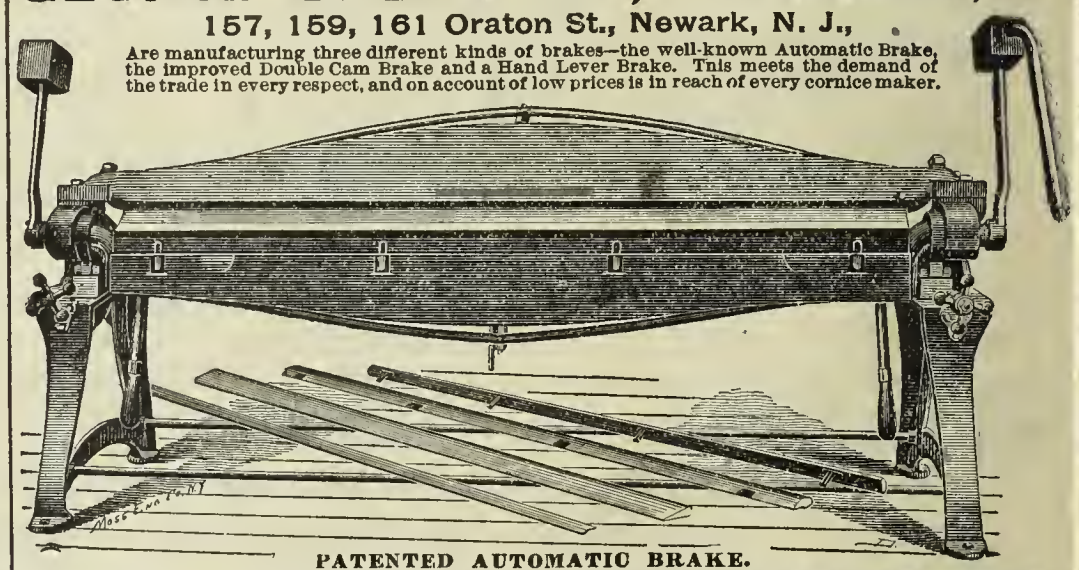
IF YOU WANT ANYTHING IN THE LINE OF
DROP PRESSES · DROP HAMMERS · STAMPS
OR AUTOMATIC DROP LIFTERS.
SEND FOR CATALOGUE
TO
Miner & Peck Mfg. Co.
NEW HAVEN, CONN.
LARGEST LINE IN THE MARKET

GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co.,

157, 159, 161 Oraton St., Newark, N. J.,

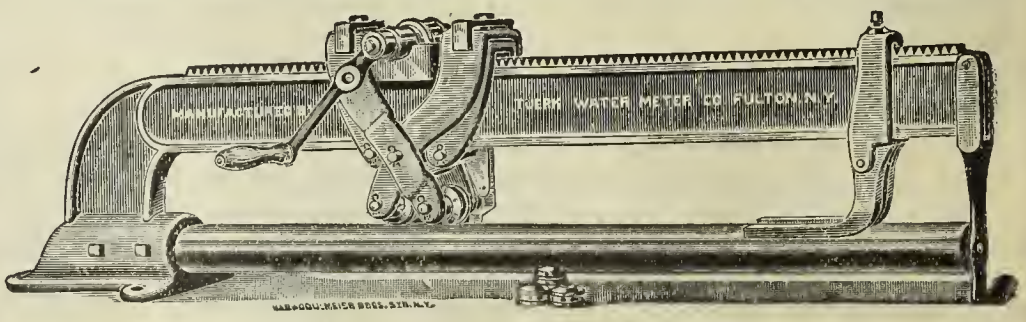
Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892 Send for our illustrated catalogue.

TUERK WATER METER CO.'S GROOVER.



SEND FOR CIRCULAR.

Manufactured by TUERK WATER METER CO., Fulton, N. Y.

POWER PRESSES.

We are manufacturing a full line of Power Presses, as illustrated, with or without gearing, single or double (when double we place two presses back to back secured on same bed plate, operated with one set of gearing and one fly wheel, serves as a double press, punch on one end and shear on the other at the one and the same time)

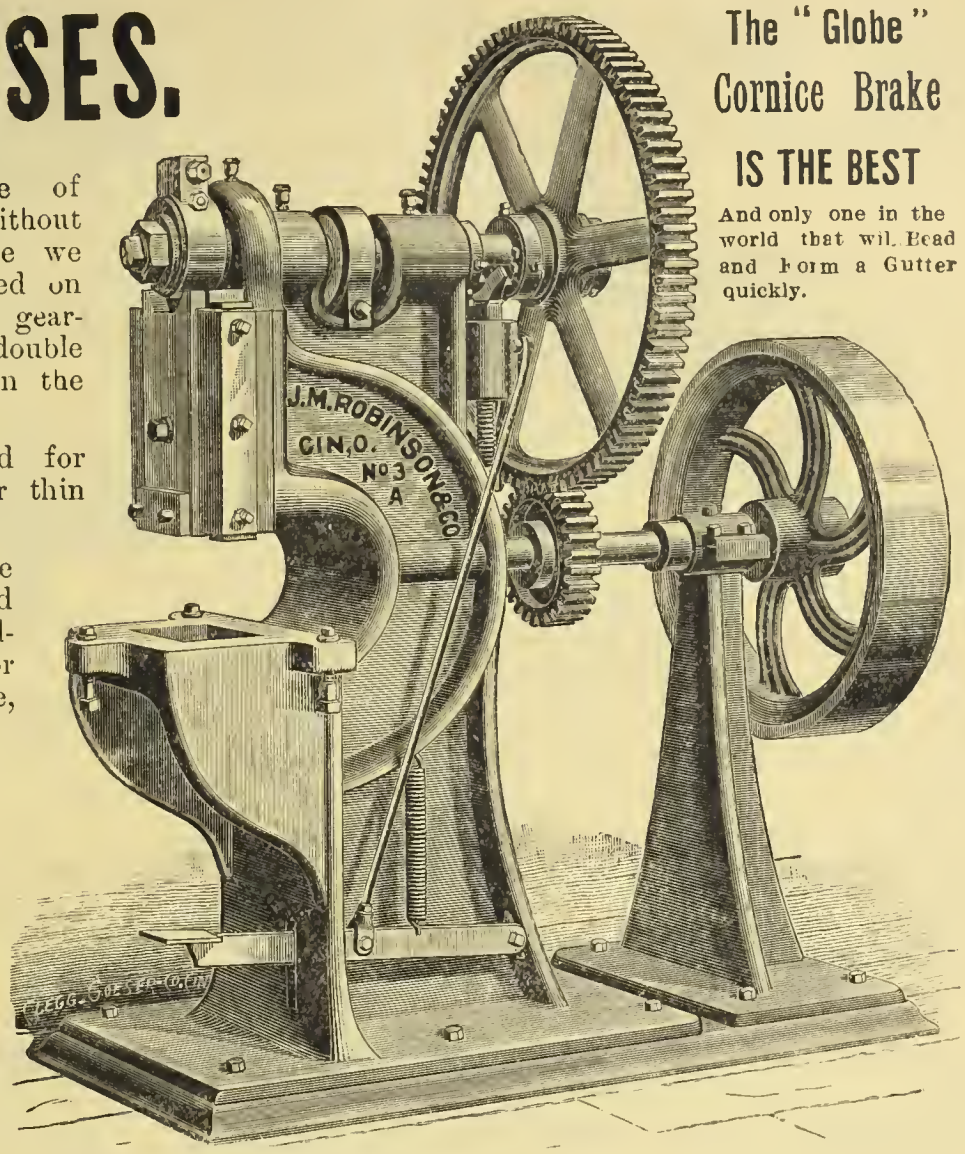
These presses are especially adapted for cutting, punching and shearing thick or thin metal and a host of other purposes.

Especial features of construction are embodied in our presses to be found in no others, which are of material advantage in getting out your work. For full description, write for catalogue, please

J. M. ROBINSON & CO.,

CINCINNATI, OHIO.

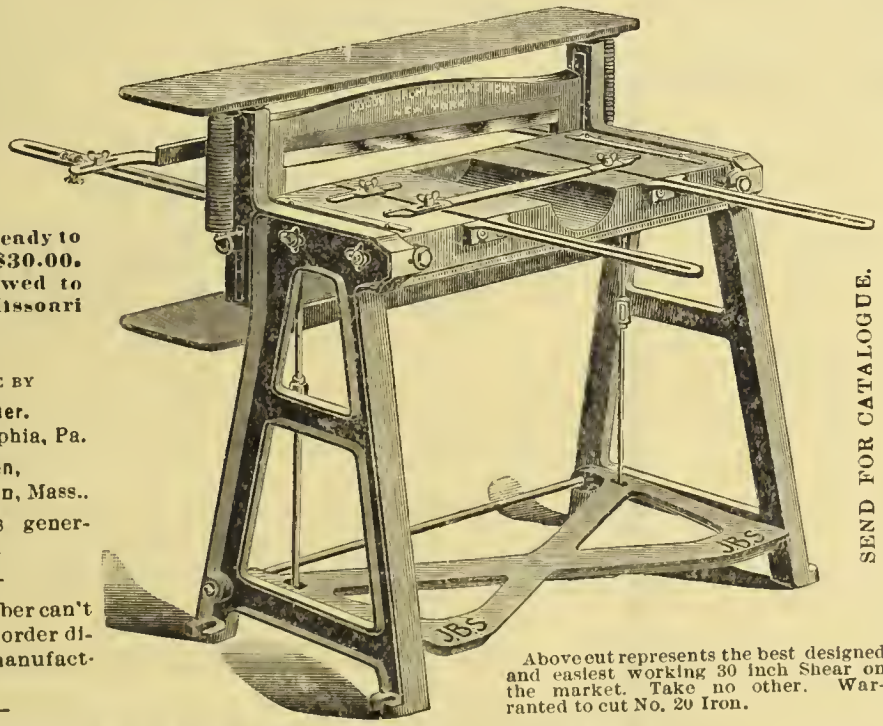
Builders of Sheet Metal Working Machinery.



The "Globe" Cornice Brake

IS THE BEST

And only one in the world that will Bead and Form a Gutter quickly.



All set up ready to use. Price, $30.00. Freight allowed to points on Missouri River.

FOR SALE BY

Hall & Carpenter, Philadelphia, Pa.

Austin & Dolen, Boston, Mass..

and jobbers generally.

If your jobber can't supply you, order direct of the manufacturers.

SEND FOR CATALOGUE.

Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

JACOB BROMBACHER'S SONS, - No. 30 Cliff St., N. Y City.
Established 1833. Incorporated 1887.

Kenney's Patent Double Seamer

FOR STANDING LOCK

TIN ROOFING.

Improved machine, from new patterns, now ready. Send for prices and flattering testimonials from users.



MANUFACTURED BY

Dwight Slate Machine Co.,

Hartford, Conn.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

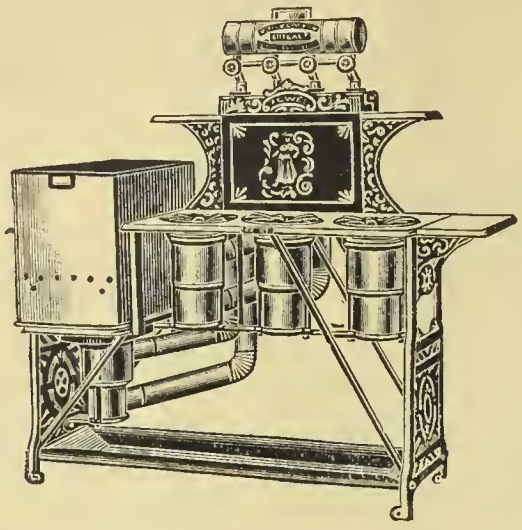
Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade Street, New York.

Gasoline Stoves! Gasoline Stoves!



We have the **Dangler New Gem** Vapor Stove.
" **Jewel Safety** "
" **Bay State Safety** "

It is useless for us to expound the merits of these stoves for you all know they are positively without a fault and **we guarantee every stove sold.**

BUT!

Are you aware that if you handle the **New Gem** or **Jewel Safety** that you avoid all competition, as none others have burners like them?

AND

you realize that if you want the agency for these stoves you must

ORDER SAMPLES NOW?

We have them in all styles and sizes.

BARSTOW STOVE COMPANY,

Manufacturers of

"Bay State" Furnaces. Ranges. **"Bay State"** Stoves. Gas Ranges.

BOSTON. PROVIDENCE, R. I. NEW YORK.

Why not keep before you special circulars and prices of our goods?

Tin for Door Linings.

12 X 24		14 X 22
13 X 26	Primes and	11 X 22
13½ X 19½	Wasters.	15 X 21
14 X 18¾	Light Weight	16 X 20
14 X 19¼	and	16 X 22
14 X 20	Full Weight.	20 X 20
14 X 21		20 X 28

Furnace Pipe Tin, IC and IX.

20 X 23	for 7	inch	pipe.
20 X 26	" 8	"	"
20 X 28	" 8	"	"
20 X 29½	" 9	"	"
20 X 32½	" 10	"	"
20 X 38½	" 12	"	"

ORDERS FILLED PROMPTLY.

N. & G. TAYLOR CO.,

Manufacturers of Tinplate,

PHILADELPHIA.

THE GREAT CHURCH LIGHT **REFLECTORS** FOR OIL, GAS OR ELECTRIC LIGHT

I. P. FRINK, 551 PEARL ST. N.Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

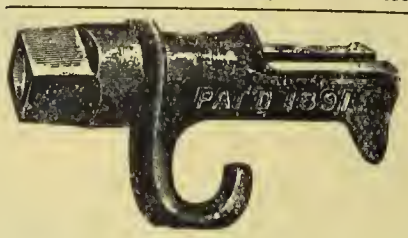
Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK

TINNERS' TOOLS and MACHINE

TINNERS' SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOO

By far the best Spout made. Greatly proved this season. More used every year t all others combined. Sold by leading jobb everywhere, and to them by

CHARLES MILLAR & SON, Utica, N.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY



MANUFACTURERS OF

PATENT PLANISHED SHEET IRON

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. A WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.

Branch Office, 111 Water St., Pittsburgh Pa.

HAMILTON'S BEST RE-DIPPED AMERICAN ROOFING TIN

—o— **IS THE VERY BEST TIN MADE.** —o—

The very best American Soft Steel thoroughly cleaned, th Dipped and Re-Dipped by hand through Pure Palm Oil until it h the thickest even smooth coat of any tin ever made in Europe America.

MORE DURABLE TIN CANNOT BE MADE.

It is the Best Roofing Tin possible to make. This is what Hamilton's Tin h been found to be by all users. Acknowledged the best by others who claim th plates to be "as good as Hamilton's."

Plates are stamped, re-squared and guaranteed by the manufacturer,

JOHN HAMILTON,

62-64 Third Avenue, PITTSBURGH, P

Our Guaranteed Brands

— OF —

ROOFING TIN

McClure's Re-Dipped,
McClure's Hand Coated,
O. B. T. Extra Coated.

McCLURE & CO.,

TIN PLATE AND METALS,

62 Second Avenue, PITTSBURGH, PA.

Index to Reading Matter. Page 57

Index to Advertisements, Pages 91 - 93.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

LIII. R 6.

NEW YORK AND CHICAGO, FEBRUARY 9, 1895.

ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



AMERICAN RADIATORS (TRADE-MARK.) BEST ON EARTH.

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

ATIONAL.

111 and 113 Lake Street, CHICAGO, ILL.

York. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.
re St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

FWCo

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.
FULLER & WARREN CO. TROY. N.Y.

HOT AIR PARAGON FURNACES

ISAAC A. SHEPPARD & CO
MANUFACTURERS
PHILADELPHIA, PA.
AND
BALTIMORE, MD.

SIX POINTS
1. FEWEST JOINTS. 2. EQUALIZED DRAFT
3. LARGEST RADIATING SURFACE
4. ABSOLUTELY SELF CLEANING
5. BALL BEARING GRATE
6. PERFECT ADAPTABILITY TO ANY KIND OF FUEL.

OUR FURNACE BOOK
"HINTS ABOUT HEATING"
MAILED FREE
IT WILL INTEREST YOU
IT MAY
HELP YOU

Apollo Best Bloom

ıere is great difference in galvanized iron.
)u can always get flat sheets and workable iron, if you of a first-rate jobber. No jobber that has any careful e could hold it without the Apollo brand.
ıere are three reasons for selling common iron: (1) it s less by the ton, and generally is sold for the same in l quantities; so the profit on it is greater; (2) it is enough for some uses; (3) and many metal-workers t know the difference.
ıe difference is: the Apollo is flat (no buckling) and (no breaking when bent) and true to gauge—(no loss ıying by weight and selling by measure.).

APOLLO IRON AND STEEL CO

PITTSBURGH PENNSYLVANIA

WORKS AT APOLLO

for new Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES
HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.

"Kitchen Boiler Connections."

A Selection of Practical Letters and Articles
—RELATING TO—
Water Backs and Range Boilers.

Compiled from *The Metal Worker*.
71 Illustrations.

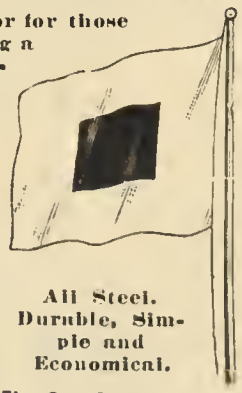
A Practical Helper. Price, $1.00.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG

Has no terror for those using a

FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.

EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

ULATORS

all purposes where any kind Automatic Regulation of Air, er or steam is required.

ASON REGULATOR CO.,
Boston, Mass.

The Jenkins Automatic Air Valve has proved to be all we claimed for it—i. e., a Positive and Reliable Air Valve. The expansible plug is a special compound, and manufactured expressly for use in the Jenkins Automatic Air Valve. It does not deteriorate or lose its flexibility under the action of heat or steam. With the Jenkins Automatic Air Valve, you should connect with a drip pipe, thus insuring a positive circulation. We guarantee them to be as represented. Our Trade-Mark is on every valve.



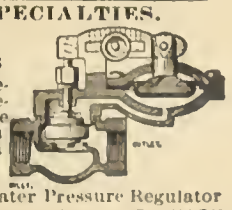
JENKINS BROS., NEW YORK, BOSTON, CHICAGO, PHILADELPHIA

STEAM SPECIALTIES.

Pump Governors,
Steam Traps

Steam and Water Reducing Valves, Noiseless Back Pressure Valves, Damper Regulators and Oil Separators.

Send for Circulars



Water Pressure Regulator

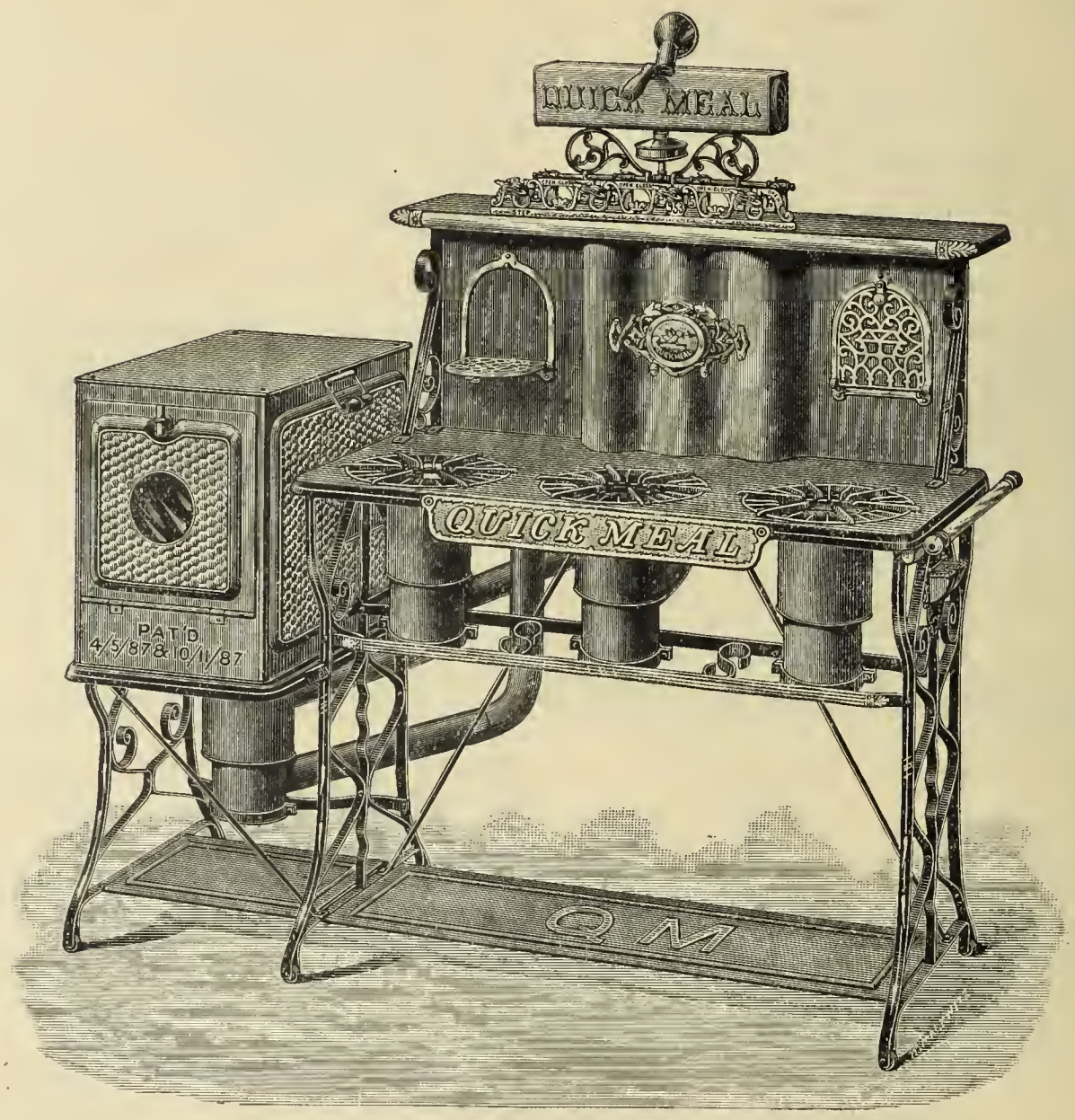
T. KIELEY, 7 to 11 W. 13th St., NEW YORK.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

ST. LOUIS.

Also the most complete line of Quick Meal Gas Stoves and Ranges.



NOTICE!!

February 9th, 1895.

TO THE TRADE:

We are pleased to announce that the FIRE at our WORKS last SUNDAY, the 3d inst., will not in any way cripple us. Only our SMALL FOUNDRY was destroyed, our second LARGE FOUNDRY NOT having been damaged. Our DUPLICATE PATTERNS are all intact, and with the stock in our STORAGE BUILDING, we **GUARANTEE PROMPT** and **IMMEDIATE SHIPMENT** of any and all sizes and styles of the

"CARTON" HEATERS.

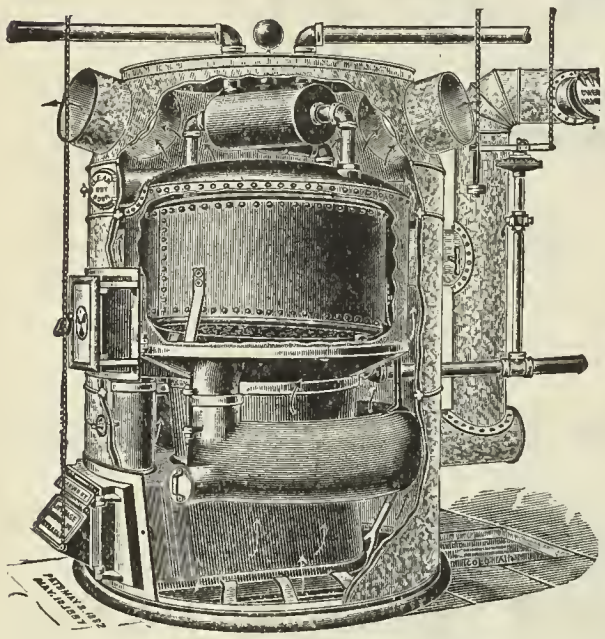
Our large Foundry, with slight repairs, will be in full operation MONDAY, the 11th inst., and our NEW FOUNDRY, now under construction, will be in operation by the 1st of March next.

Soliciting your valued orders and thanking you for past favors, we remain,

Yours respectfully,

THE CARTON FURNACE COMPANY.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

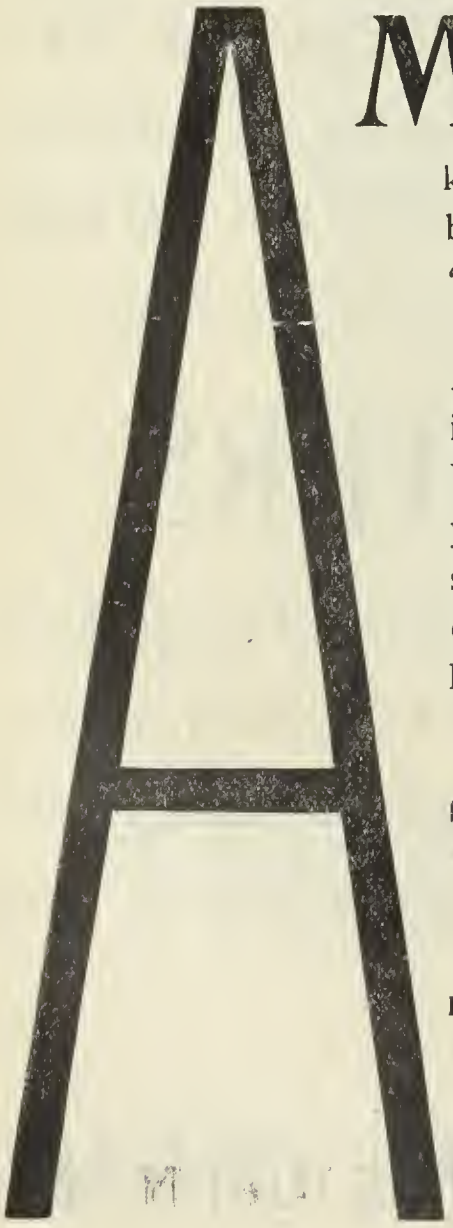
Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.



Man having no

knowledge of the furnace business is likely as not to be gulled by such effervescent statements as "The Best," "The Only," "Guaranteed" and a host of others of like character, but what we want to impress upon the public is the fact that "The Favorite" **is** good, **is** efficient, **is** economical and **is** cheap! What more can you ask? If you'll write we'll make you a special proposition. Will you do it? If so do it now, not later, it may be too late.



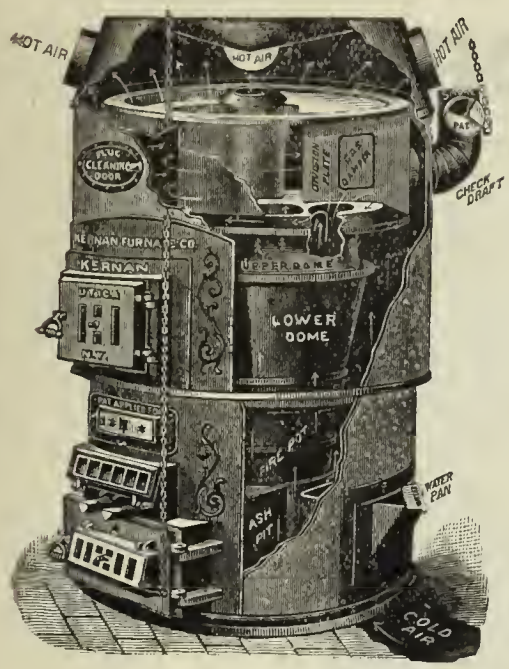
The Peck-Williamson Heating & Vent'g Co.

Formerly The Bennett & Peck Heating & Vent'g Co.),

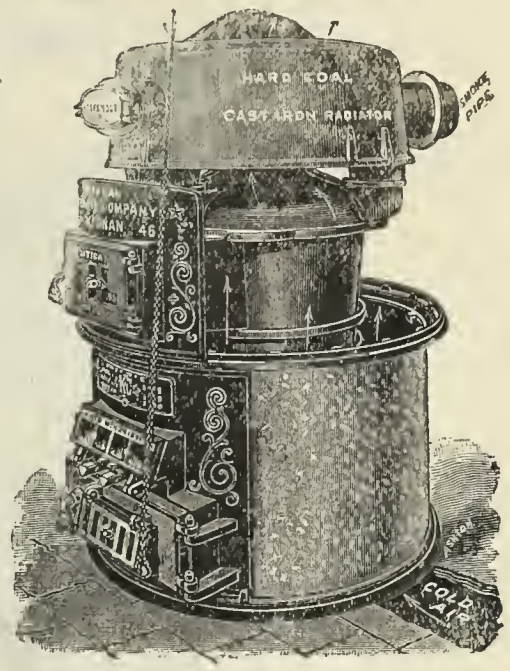
Cincinnati, O.

CHICAGO OFFICE,
82 W. Washington Street.

KERNAN



Heavy Grade Hard Coal Furnaces. *Especially* adapted for Large Dwellings, Public Halls, Schools and Churches.



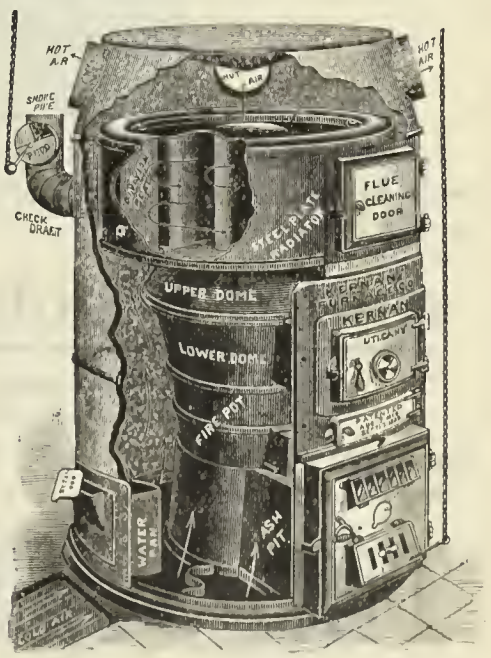
Made in Four Sizes, with 42 to 60 inch Casings.
With Steel Plate or Cast Iron Radiators.

Warm Air Furnaces,

BRICK SET——or——PORTABLE.



A Lighter Grade Hard Coal Furnaces. *Especially* adapted for Smaller Dwellings. *Economical and Durable.*

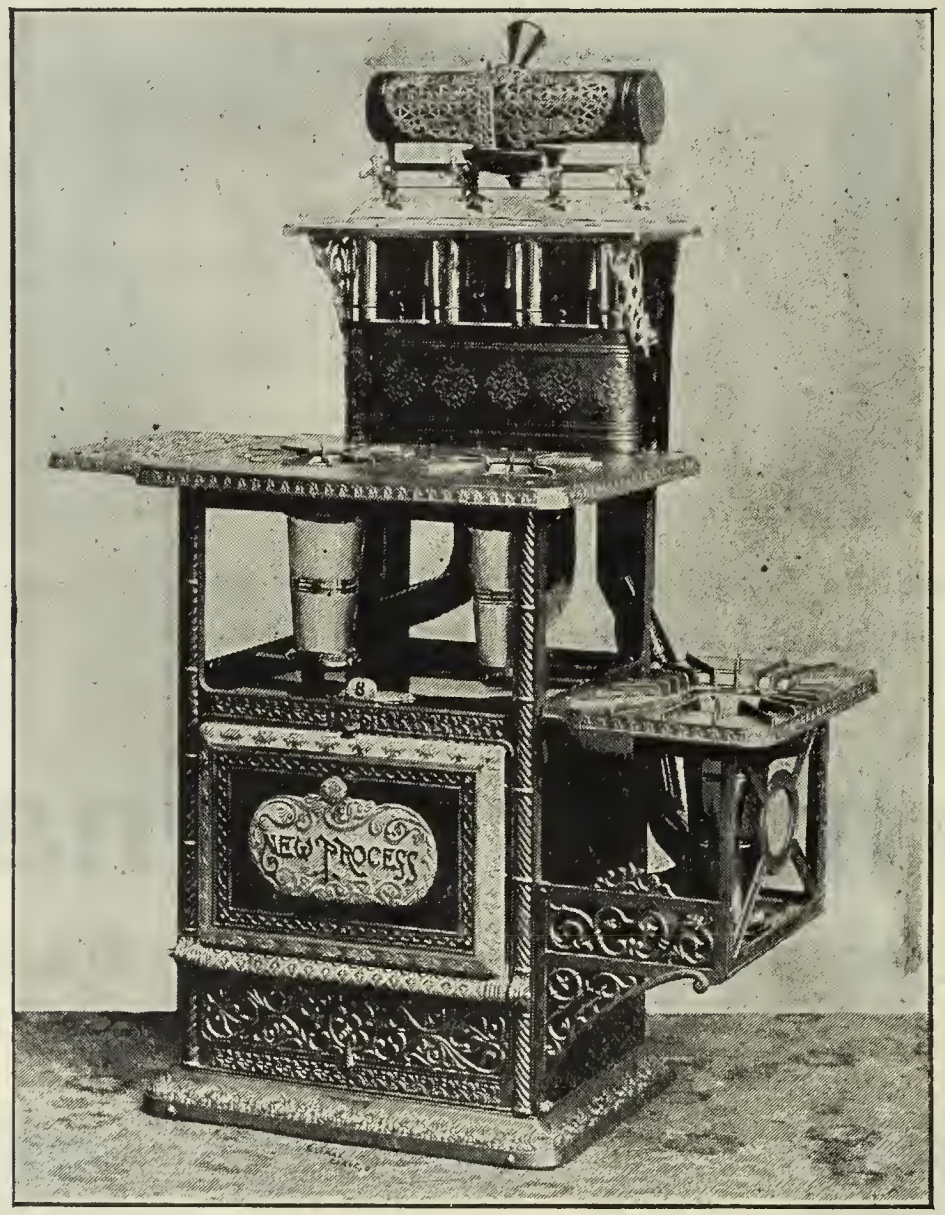


Made in Six Sizes, with 28 to 51 inch Casings.
With Steel Plate or Cast Iron Radiators.

Kernan Furnace Co.,

CHICAGO, ILL. **UTICA, N. Y.**

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

——MADE ONLY BY——

THE STANDARD LIGHTING CO.,
CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La.
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
Milton Rogers & Sons, Omaha, Neb.

IMPORTANT ANNOUNCEMENT.

To Our Patrons and the Trade Generally:

Our new Catalogue for 1895 will be ready for distribution within a few weeks. We take this means of announcing in advance of its publication that we have very carefully studied the requirements of the trade in every particular, and that our lines will be complete. We will place on the market specialties in entirely new goods that will commend themselves both by reason of popular prices and their many attractive and desirable features. In addition to our very popular Oilgas Cook Stoves, containing our improved 1895 Burners that are giving such perfect satisfaction, we have something entirely new in the line of special Lamp Stoves at special prices; also Sheet Steel Circular Burner Oil Cook Stoves. Write for further information and prices.

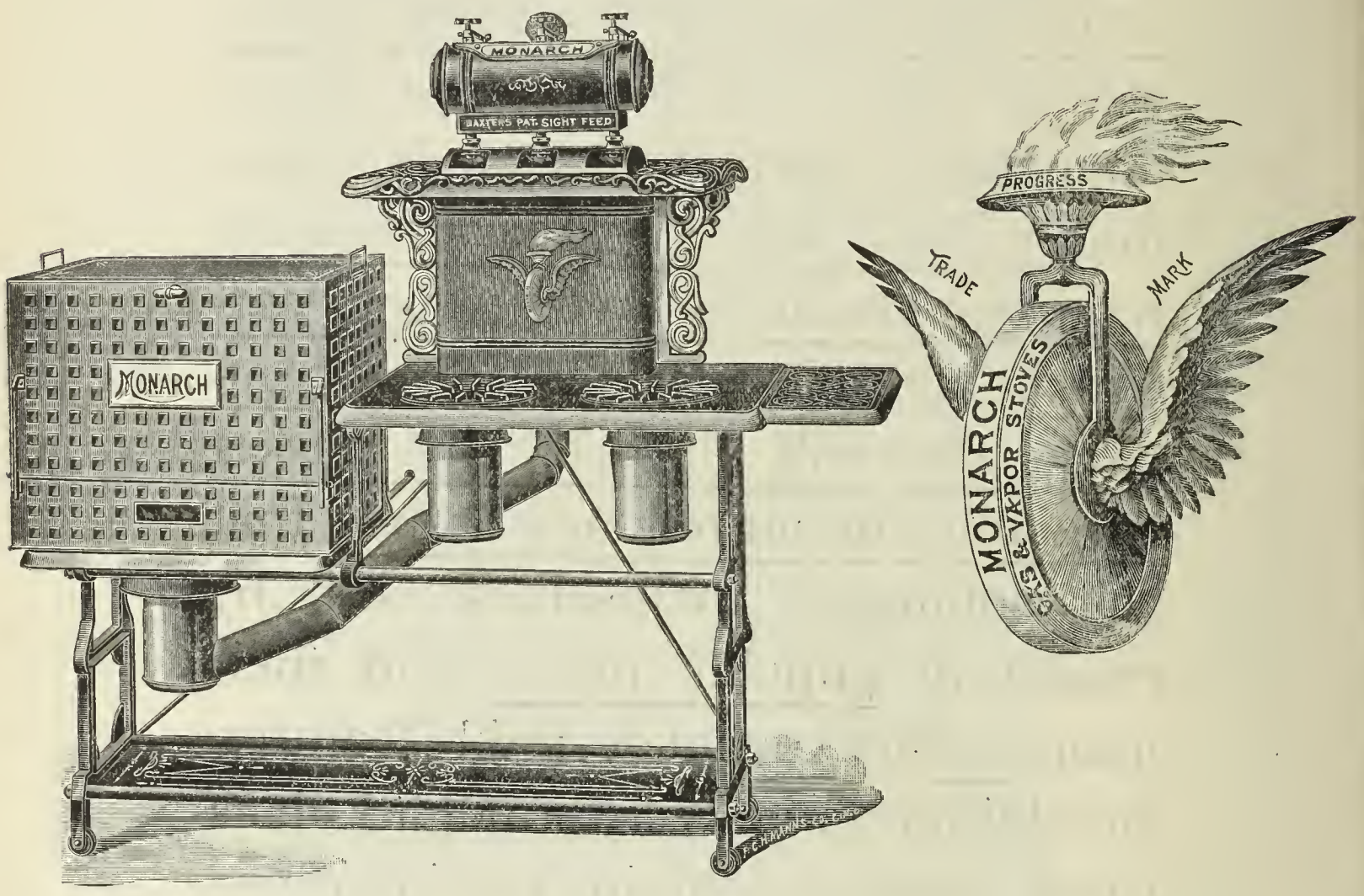
CENTRAL OILGAS STOVE COMPANY,

—Manufacturers of—

Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes.

BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.

Throughout the year of Ninety-five
The MONARCH STOVE COMPANY will be alive;
And Dealers who 'gainst hard times strive
With MONARCH STOVES will see trade revive.



Our Spring Poet may be off color, but he sings truthfully. The new Catalog is now ready and it's a Hummer.

Yours for the asking.

A postal card will tell us you want one, and will be tickled to death to send it.

The Monarch Stove Co.,

MANSFIELD, OHIO.

AGENTS.

E. H. HUENEFELD, - - Cincinnati, O., Ky., Tenn., So. Ohio. So. Ind.

COOK RANGE & STOVE CO., Chicago, Ill., Wis., No. Ill.

DANVILLE STOVE CO., Danville, Pa., and 284-286 Pearl St., N. Y., Penna. New York. New Jersey, New England.

THE ZAHNER & BATTELL MFG. CO., Kansas City, Missouri, Kansas.

THE HALL BROS. CO., Lincoln, Neb.

DEALERS!

All Weak Points About Vapor Stoves

are not called to your attention by unscrupulous manufacturers or their salesmen. They often palm off imperfect and faulty stoves as perfect, and jolly you into the belief that you have struck a bargain.

But when summer comes and truth comes to light, as it invariably does in the vapor stove business, vexation and disappointment come with it. Vexation, because you have been duped, disappointment, on account of the loss of a season's profit.

Better handle a *good line* at a fair profit than a *poor* line at a *bargain* profit. There is no such thing as a "bargain," especially in the vapor stove business. *Proof*—Review the past???

Better buy from a responsible manufacturer or his legitimate jobber, especially of one whose integrity is unquestioned, and one whose knowledge of the vapor stove business secures you an honest deal and prevents the imposition of fakes or shoddy goods. *There are a few of us left.*

Better buy a good line to be successful. A *bad* stove is a very poor purchase at *any* price.

Better look for Protection.

Protection in order to be of service to you must begin at home. See that this point is not overlooked when casting about for a line for 1895.

Better think this over.

The old adage reads, "Make Haste *Slowly*." This is a weighty proverb. The more so when you consider that the best versed manufacturers in the vapor stove industry are not offering any new inventions or innovations for the coming season.

Yours respectfully,

THE SCHNEIDER & TRENKAMP CO.,

479-501 Case Ave., Cleveland, O. 67-69 Lake St., Chicago, Ill.

Jobbers Who Will Handle the Reliable for 1895.

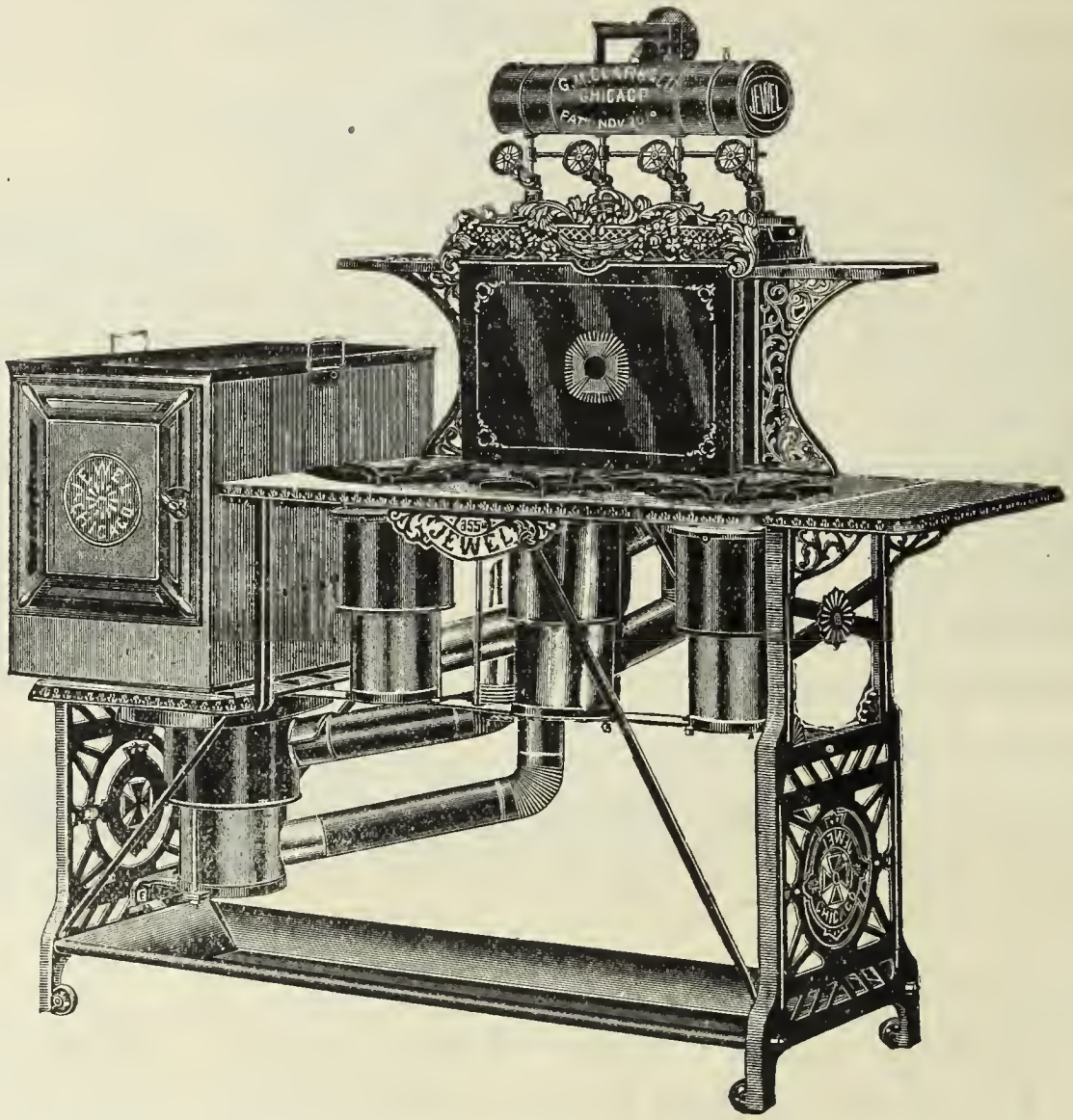
THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas and Oklahoma Territory.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F. FOX, Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

CATALOG READY SOON.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO. Buffalo, N Y.
BARSTOW STOVE CO., New York, N. Y.
W W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

1895.

SAM S. UTTER,

113 Beekman Street, New York,



Sam S Utter's
50th year in the
STOVE BUSINESS
and
STILL GROWING.

Offers the best line of Lamp Stoves in three grades. Also the most **POPULAR** and best sellers in the market, such as the

GAME in four sizes; 1, 2, 3 and 4 Burners, with Tank in one piece. Sam S. Utter's Patent Wick Tube of BRASS, in one piece. An extra first-class stove in every way.

SUMMER GIRL, in three sizes; 1, 2 and 3 Burners, with Tank in one piece and Chilled Iron wick tube. The next best to the **GAME,** but superior to any other.

SOLO.	DUET.	TRIO,	QUARTETTE,
1 Burner.	2 Burners	3 Burners.	Two Duets and frame.

With Tin wick tubes. Cheaper and better than any other low priced Lamp Stove.

GAME GAS STOVES, with flat tops; two styles, in 1, 2 and 3 Burners.

NEW GAME OIL STOVE.
PARLOR GAME OIL HEATER.

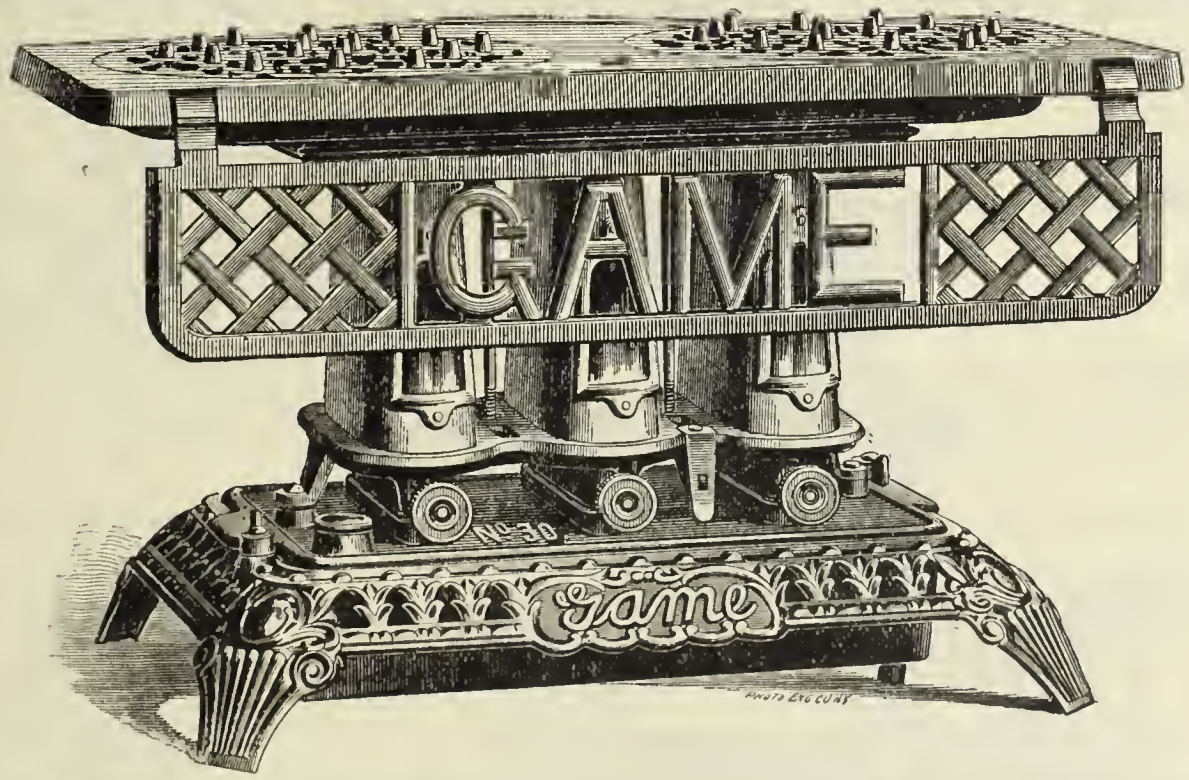
A grand success. A prize **Parlor Heater.**

SAM S. UTTER'S Patent Tops and Bases for Lamp Stoves.

LARGE BUYERS and JOBBERS will find it to their advantage to send for prices and secure territory. Address

SAM S. UTTER,

113 Beekman Street, - - NEW YORK.



GAME LAMP STOVE IN FULL DRESS with Sam S. Utter's patent Top and Shelf and Base.

ALL MY LINE FOR SALE AT MY PRICES BY

JACOB RETTERER, for Chicago, and West and Northwest.
BURTIS & CO., in Troy, for New York State and Western New England.
J. M. BORDEN & CO., in Philadelphia, for Phila., and as far East, West, North and South as their trade extends.
C. B. BAKER, in Cleveland, O., for Ohio and Indiana.
CRIBBEN, SEXTON & CO., Denver, Colo., for Colorado and surrounding States.

Hear 'em Holler!
Oh, my! ain't it Funny?
The "combine" at last see their Waterloo.
The beginning of the end of the Vapor Stove Association.

No wonder they holler, for they know not "where they are at." The L. & H. Process did it.

Dear people, don't be alarmed when you hear their noise. It is the old story of great cry and little wool. Have you read their bluff? Of course you have. Ain't it sublime? Oh, my! what a lot of advertising for us. A regular snap.

Just as soon as the dealer reads their warning he gets on his fighting clothes and at once looks into the merits of the L. & H. Process. We are deluged with orders, and are all smiles, for the trade stands by us and will not be intimidated by the "combine." We know who our friends are, and therefore congratulate ourselves. When the dealers see our L. & H. Process stove they will have no other. The "combine" know this; hence all the commotion, and all they can do is to rush into print in their efforts to stem the return of their boomerang, but it does not work and in their agony they ask themselves "how can it was?"

Buy nothing but the L. & H. Process. **We are with you. Your interests** are ours. **We are here to stay.** The **L. & H.** mark shines **brighter than ever,** for **"It's a good thing, push it along."** Hurry up and write for catalogue so you will not be left.

A. J. LINDEMANN & HOVERSON CO., Milwaukee, Wis.

AURORA PROCESS STOVES

"AURORA" IS KING.

Sales in 1894 Doubled.

Brass Cylinders; German Silver Points (Rust Proof); Removable Drip Valves; Sight Feeds; Ornamental High Shelf Brackets; Extra Extension Shelf on all Stoves.



Full line of Hot Generating Stoves and Ranges.

Also Junior Stoves, High and Low, all with Drop Tank.

Fine line of Gas Ranges and Hot Plates.

We defy all Competition on finish, operation and style of "Aurora" stoves.

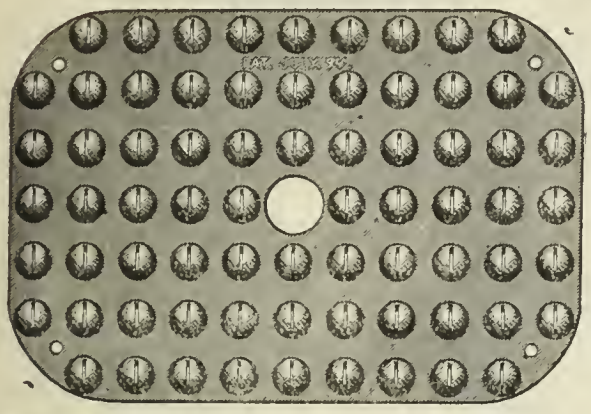
Send for 1895 Catalogue, now ready.

AURORA VAPOR STOVE CO., CLEVELAND, OHIO.

AGENTS:—THE PERRY STOVE CO., Albany, N. Y. H. W. PEAK, Fort Worth, Tex. JACOB RETTERER, Chicago, Ill. JAS. BEAKEY STOVE CO., St. Louis, Mo. JANNEY, SEMPLE & CO., Minneapolis, Minn. D. B. BAYLESS STOVE CO., Cincinnati, O. MAHOOD & Co., Philadelphia, Pa.

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.



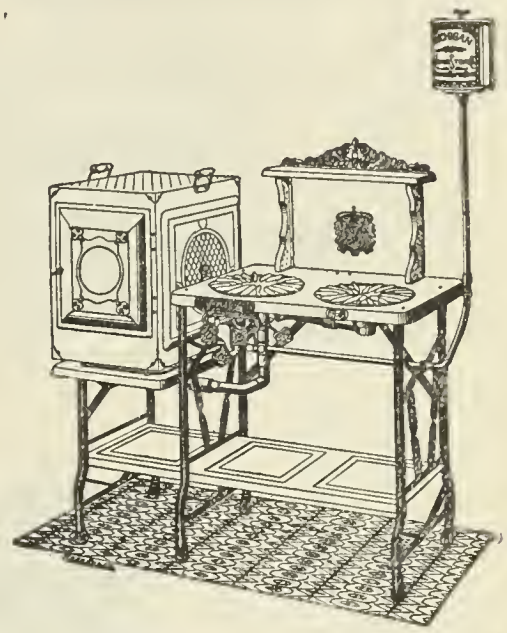
No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*

OUR JET CONE BURNERS

distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

and

SPECIAL JUNIORS.



Simplest, Safest, Best.

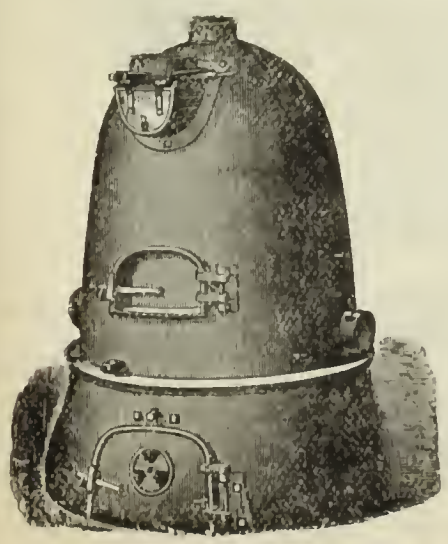
Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET, - - - - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

Announcement of

An Important Meeting to take place at Offices of

The Ferrosteel Company,

Wade Building, Cleveland, Ohio,

Monday, February 4th, 1895—And following days.

This meeting is one of orders and inquiries for Ferrosteel Ranges that will be received. Also applications for agencies. Orders from traveling representatives, too. Will your order, inquiry or agency application be received with others? It's the style now to handle Ranges made of Ferrosteel. New sizes for 1895 Spring trade.

THE

Warren Steel Range.

IMPORTANT ANNOUNCEMENT.

To Jobbers and Retailers of Steel Ranges:

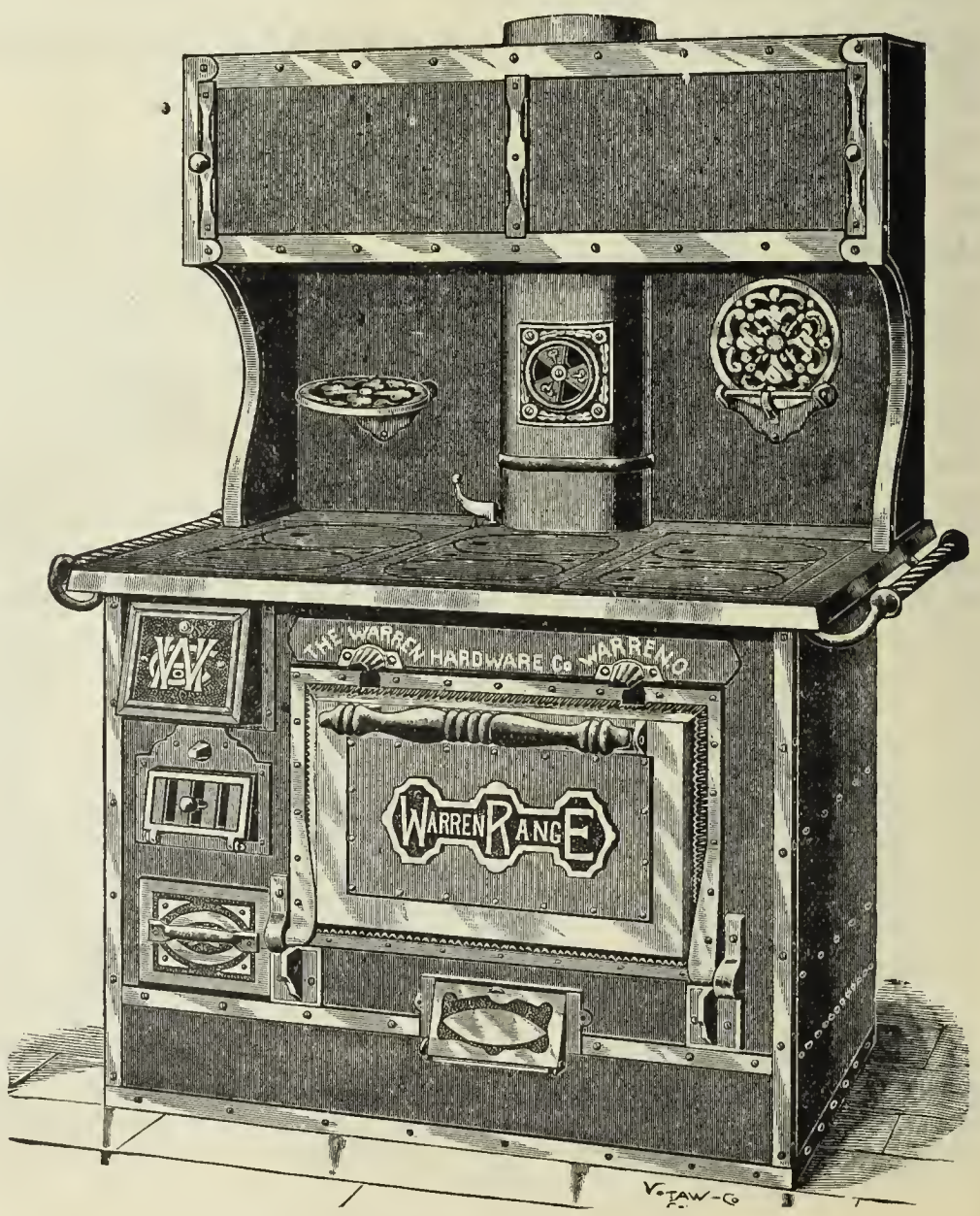
Don't fail before placing your order for Steel Ranges to get catalogue and prices on our new line of Warren Ranges for 1895. New and original and the finest line of Ranges on the market. With Duplex Grate to draw out front of range without disturbing fire linings. Full size opening of oven 18 x 20 x 14, 20 x 22 x 14 and 22 x 23 x 14. Lined throughout with asbestos. Write for prices and catalogue.

MANUFACTURED BY

THE WARREN HARDWARE CO.

7 Market Street,

WARREN, OHIO.





Merchants can now buy their entire stove line from
The Michigan Stove Company.

It has been said that in America TWO CLASSES of Stoves and Ranges are sold, viz.:

"GARLANDS" AND OTHERS.

At the very head and front of the "Others" stands our new line of

"MICHIGAN" Stoves and Ranges,

Which are unquestionably the latest, handsomest and most artistically-designed Stoves and Ranges to be found upon the market at anything like the price at which they are sold.

They are made under our own supervision; by same workmen and out of the same material from which "Garlands" are made, and this fact of itself should be sufficient to cause them to be preferred by discriminating merchants and consumers, as against all other brands, excepting the invincible line of "Garlands."







Acorn Ranges.

The pushing, energetic stove dealer who does not sell **Acorn Ranges** is making a great mistake. The same effort expended to sell **one** range of other makes will sell **two** or **more** Acorns. After an **Acorn Range** is sold it stays; what is better, it is **a** constant advertisement, **and** will sell more.

Every stove dealer who is anxious to **increase his business,** who wishes to make **more money,** and to do it easily and quickly, should at once write us for circulars and prices of **Acorn Stoves** and **Ranges.** They are made to use any kind of fuel, and for every section of country. They will change a poor business into a good one. Your competitors can do the complaining about "hard times" if you sell **Acorn Ranges.**





RATHBONE, SARD & CO.,

Albany, N. Y. **Chicago, Ills.**

Detroit, Mich. **New York City.**

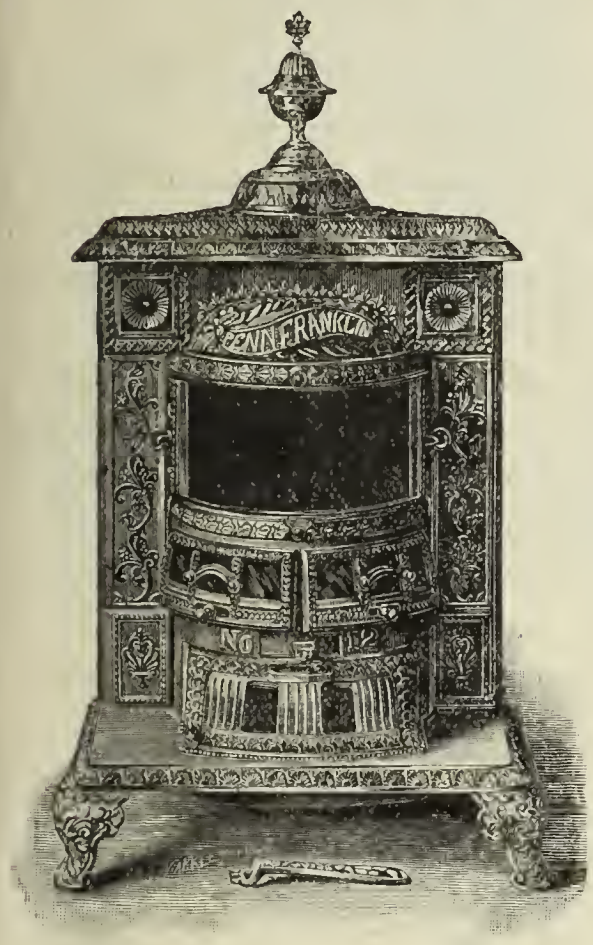
FOUNDRIES:

ALBANY, N. Y. AURORA, ILLS.



The

Penn Franklin



Open Parlor Stove.

(Easily Converted into a Natural Gas Stove.)

Just close the mica doors and it can be operated like any round or square parlor stove. Close it up tight and there is no dust when raking. Burns any kind of fuel, and is a strong heater.

Easy to Sell,

Profitable to Handle.

☞ DROP US A POSTAL FOR PRICES.

Mt. Penn Stove Works,

READING, PA.

A FEW WORDS

TO THE PROGRESSIVE DEALER.

THE CINDERELLA KITCHENERS

Are an entirely new series of

ALL CAST IRON RANGES,

Adapted for burning

HARD OR SOFT COAL OR WOOD.



The Reservoir is Planished Copper, and holds fifteen gallons.

They have embodied in their construction many new and desirable features that are thoroughly practical and will meet the approval of the "up to date" dealers. The Cinderella Kitcheners are also made with feet and skirting in lieu of the Low Closet. A full complement of High Shelves and High Closets accompany the same. Every appointment is the latest, and for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No 716,.....	Oven 16 x 16, 10½	inches high.
718,.....	18 x 18, 11½	"
818,.....	18 x 18, 11½	"
719,.....	18 x 20, 12½	"
819, ...	18 x 20, 12½	"
821,.....	20 x 22, 13½	"
921,.....	20 x 22, 13½	"

IF YOU ARE INTERESTED WRITE FOR PRICES.

We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

We Would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited, - - Pittsburgh, Pa.

Taplin, Rice & Company,

——Manufacturers.——

DICTATED BY P. **Akron, Ohio,** January 29, 1895.

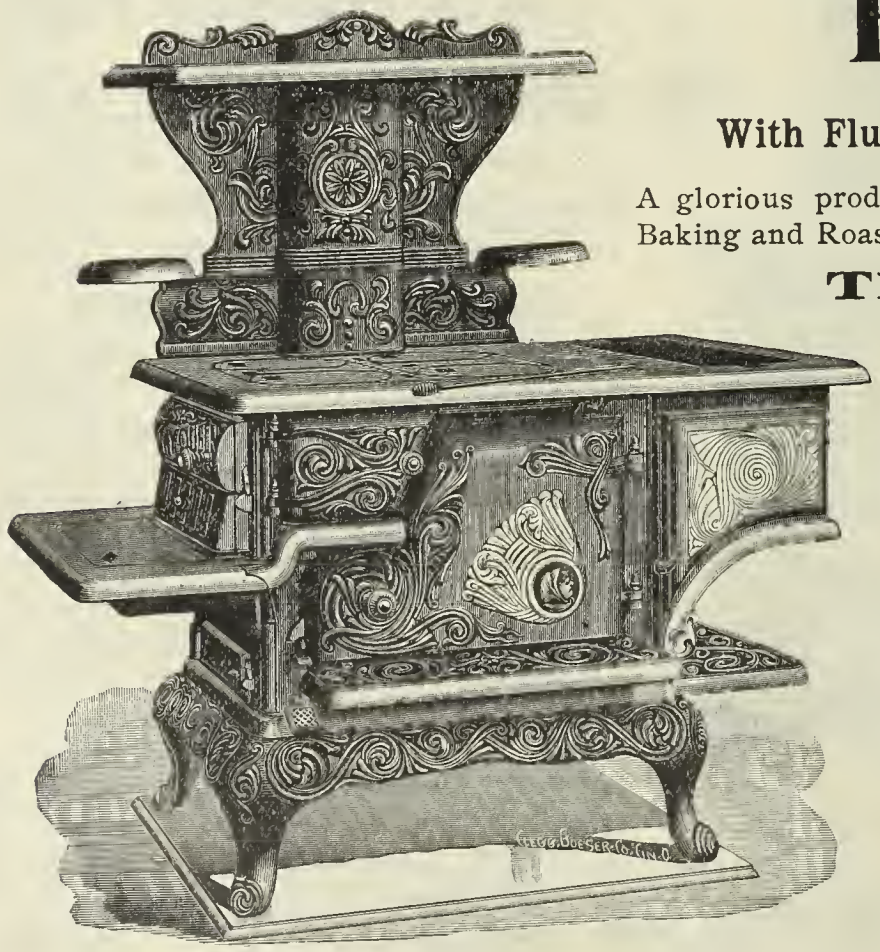
BY THIS we beg to call the attention of the trade to the fact that during the current year we will be on the market with several new patterns of Steel Ranges and Heating Stoves, of superior construction, ornamentation and attractive form, the patterns of which are well under way and will soon be ready for the sand. The Climax Steel Range, which will be made in all the various conventional forms and styles, will be both as to construction and appearance second to none on the market. We will also have ready for the trade in due time a "Climax Air Blast" and "Climax Air Tight" heating stove in different sizes, the constructive features of which will be a radical departure from any pattern of stove ever offered, and we feel well assured they will wherever introduced take a leading position in the line of special heaters. Cuts and prices of these Ranges and Stoves will be mailed on application at an early date, and we are confident you will feel justified in deferring your order for supplies until samples or cuts of stoves named may reach you.

With grateful appreciation of former courteous favors shown us by the trade, we remain,

Very respectfully,

TAPLIN, RICE & CO.

MY QUEEN RANGE.



With Flush Reservoir, for Wood Only.

A glorious production, heavy, well proportioned, perfect in Baking and Roasting Qualities, and above all a fuel saver.

The Queen Series

are right and so are the prices. Send for Catalogue.

The PORTSMOUTH STOVE AND RANGE COMPANY,

——MAKERS——

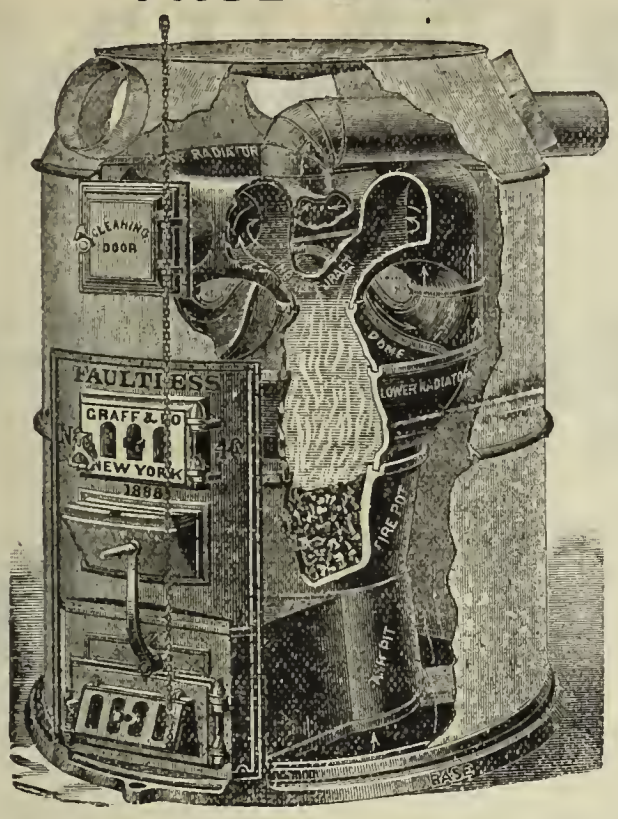
PORTSMOUTH, OHIO.

AGENTS:

R. ROBINSON & SONS, Chicago for the Northwest.
A. L. CANFIELD, 284 Pearl Street, New York, for New England States.
C. F. HAKE & SONS, for Cincinnati and Vicinity.
HOME STOVE CO., Indianapolis, Ind.
W. E. ANTHONY & CO., Detroit, Mich.; Mich. and Minn.
BRADLEY, MUNK & CO., Columbus, Ohio.

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustration mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.

FAULTLESS.



SUPERIOR GOODS.

FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.

HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.

Faultless, Elegant and Columbian Ranges

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.

FURNACES

Mfd. by

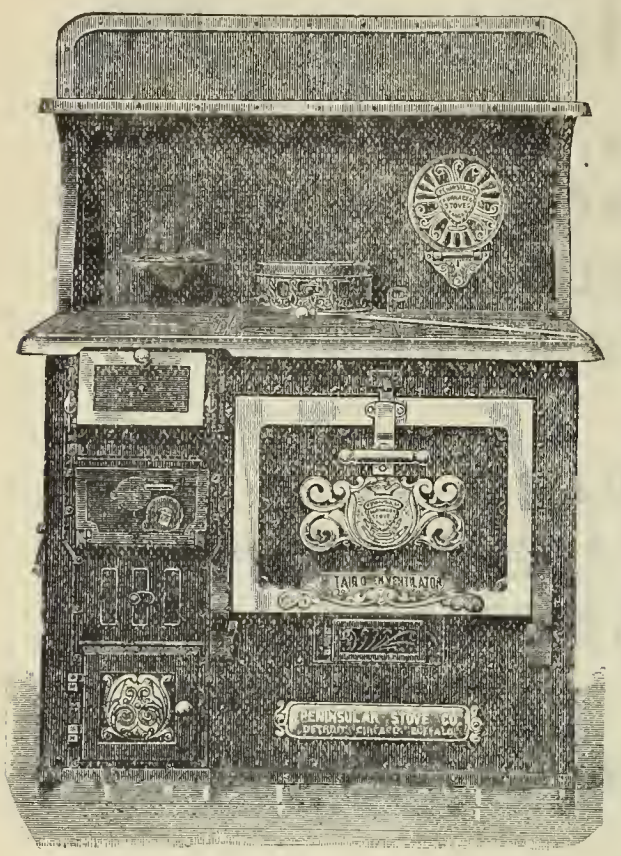
The Craig=Reynolds Fdy. Co.,

DAYTON, O.

The
TRIUMPH
Series.
"There are none better."

GEO. D. HOFFMAN,
Mgr. Western Branch,
82 LAKE STREET, CHICAGO,

Patent *STEEL* Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



PENINS
WROUGH
RAN

IN ALL SIZES.

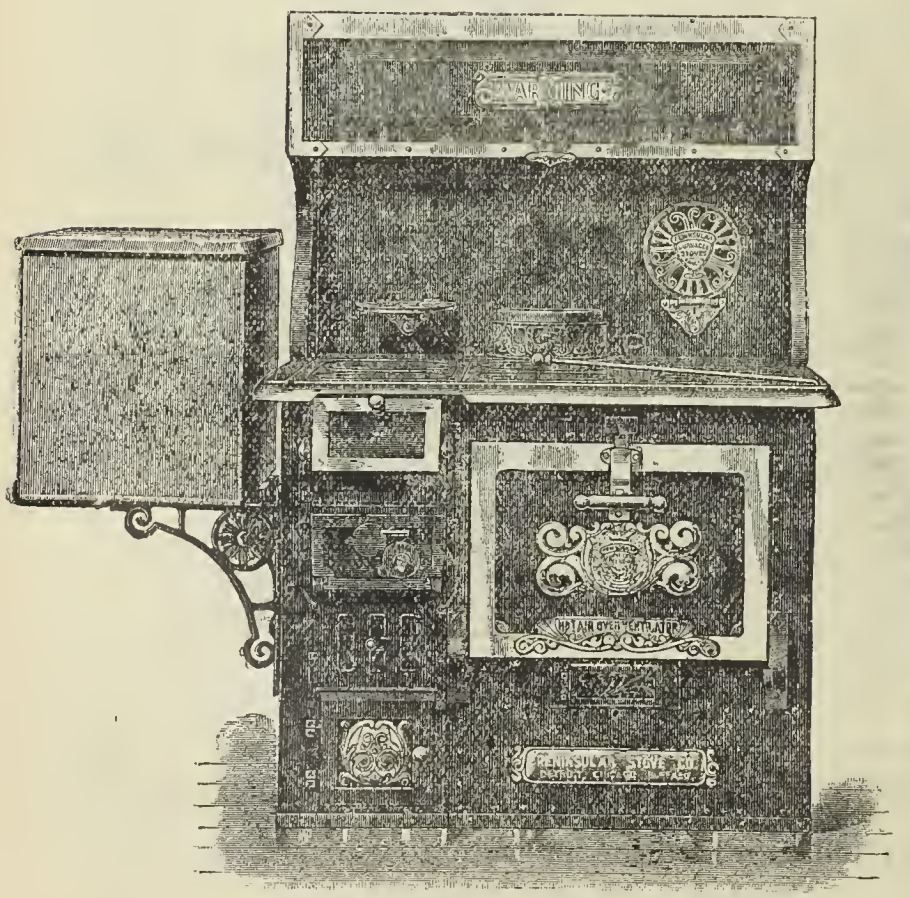
FC

18



An Entirely New Line.





Write for Catalogue.

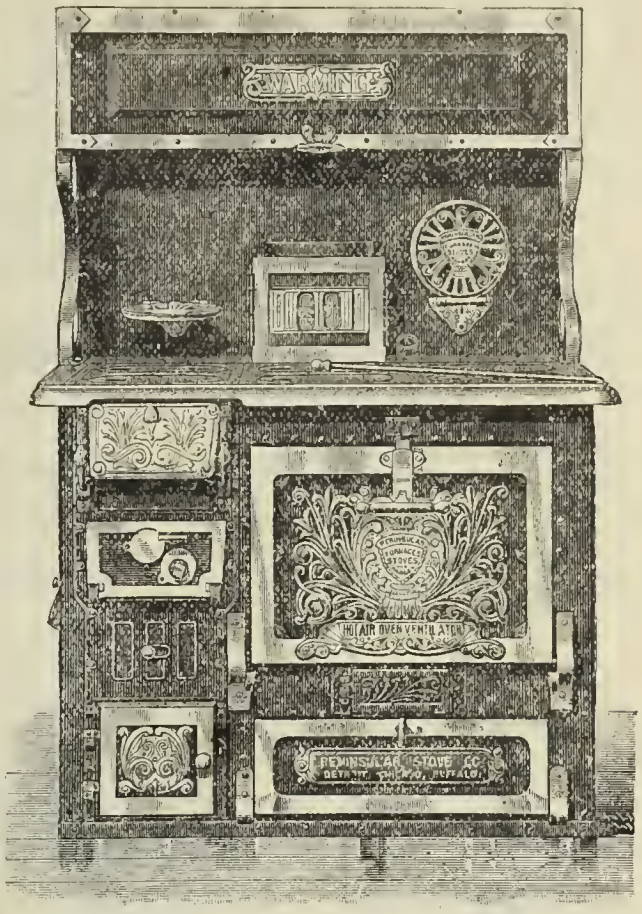
The Largest and Best Equi
facturers in

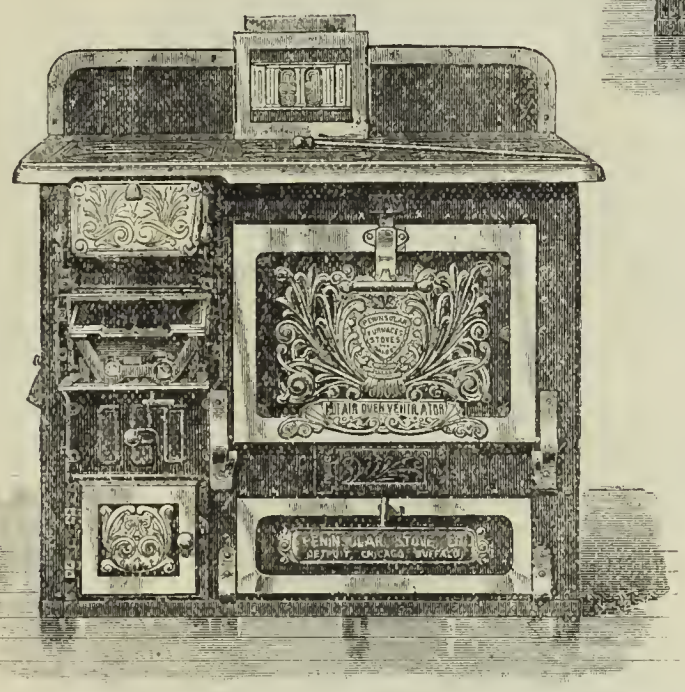
THE PENINSULAR

Detroit. Chica

SULAR
T STEEL
GES

IN EVERY STYLE.

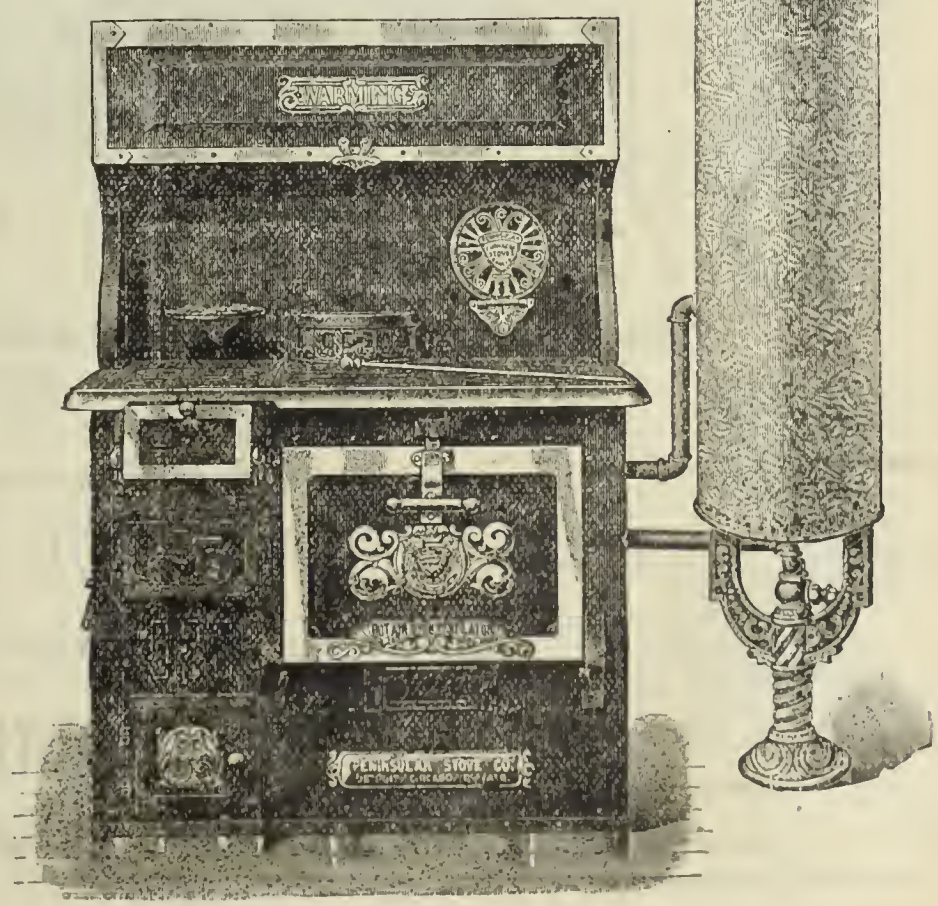




Any Combination Desired.

Ask for Discounts.





ped Steel Range Manu-
ne World.

TOVE COMPANY,

o. **Buffalo.**

HAVE YOU SEEN IT?

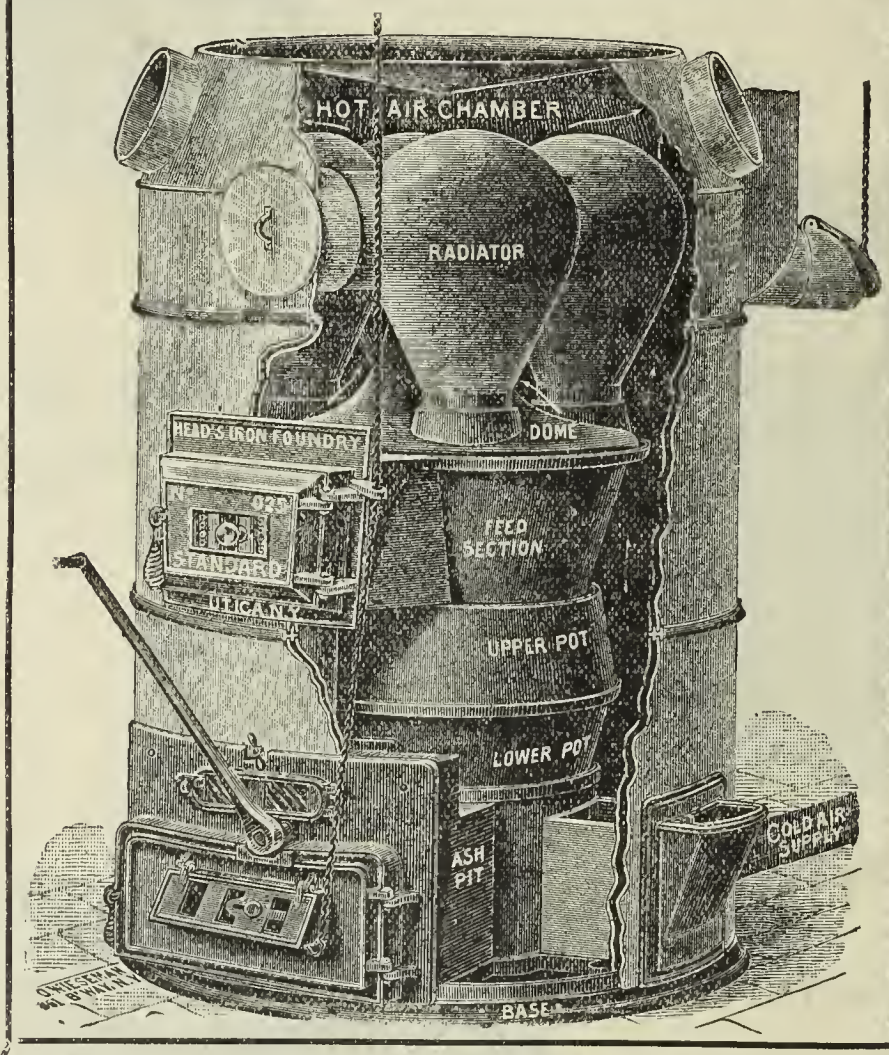
THE

ORIGINAL and ONLY Self-Cleaning **Standard** **Four Dome**

Furnace.

It is praised from Maine to California because it is the most powerful and satisfactory Heater made.

STANDARD



FURNACE

IT BEATS THEM ALL

In Points of DURABILITY, ECONOMY, EFFICIENCY.

Has All the Modern Equipments.

PLEASES EVERYBODY.

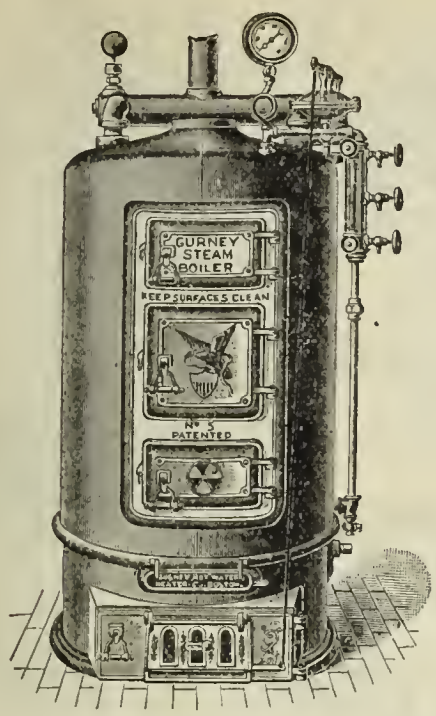
Just the Furnace for Your Trade.

You can save money by selling it.

Send for our Catalog and Prices.

GIBLIN & CO., Makers,

UTICA, N. Y.



Gurney Steam Boiler.

RESULTS ARE CONVINCING EVIDENCE.

THE GREAT SUCCESS WHICH

Gurney

HOT WATER HEATERS, STEAM BOILERS, RADIATORS,

Have attained is due to the **FACT** that they embody

BEST

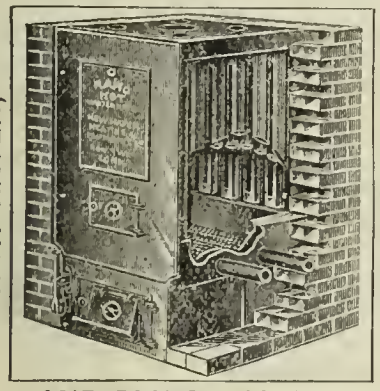
WORKMANSHIP,
CONSTRUCTION,
MATERIALS,
ADAPTABILITY,
IDEAS.

ALWAYS EQUAL TO THE OCCASION.

Send for Catalogues. Sold only to the Trade. **GURNEY HEATER MFG. CO.,** 163 Franklin St. Cor. Congress, Boston, Mass.

Selling Agents, A. A. Griffing Iron Co., 34 Dearborn St., Chicago, Western States.

NEW HAVEN HEATING



NEW HAVEN, CONN.

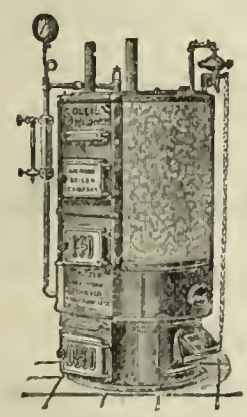
AND PLUMBING CO.

Rapid Hot Water Heater,

Selling rapidly to the Trade only.

MONEY IN IT FOR YOU.

Send for Catalogue, Price-List and Discount.



"Soleil" Safety Steam Boiler.

All the Excellencies

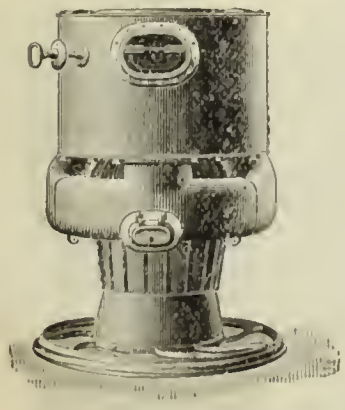
of **Superior Quality,** with the **Additional Recommendation** of **Reasonable Cost**— our Steam and Hot Water Heaters.

Radiators, Valves, Pipe, Fittings, Floor and Ceiling Plates, Etc.

American Boiler Company

94 Centre St., New York. **84 Lake St., Chicago.**

OXFORD PERFECT BLAST FURNACES.



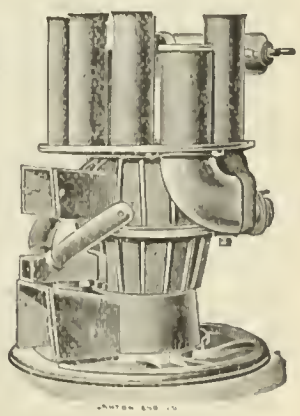
CONSTRUCTED WITH A

POSITIVE WORKING AIR BLAST

AND

UTILIZING INDIRECT CURRENTS

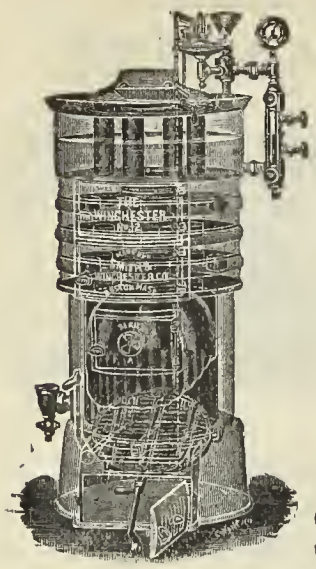
TO INCREASE HEATING CAPACITY.



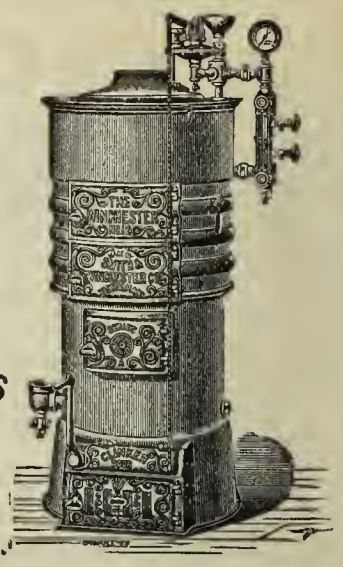
SEND FOR NEW CATALOGUE.

THE J. H. McLAIN COMPANY, Canton, Ohio.

NEW YORK, 69 Centre Street. CHICAGO, 88 Lake Street. DENVER, 1525 Champa Street, SAN FRANCISCO, 5 Crocker Bld'g.



The Winchester



Has more ***COMMENDABLE***

And less ***OBJECTIONABLE FEATURES***

Than any Heater on the Market.

——MADE BY——

SMITH & WINCHESTER CO., Boston, Mass.

Our prices on these Heaters will please you. Send for them.

ROYAL HEATERS

SOLD ON THEIR MERITS. NOT ON THEIR ANTIQUITY.

HOT WATER. STEAM. HOT AIR. COMBINATION.

LARGEST ASSORTMENT OF STYLES AND SIZES.

CATALOGUES GIVE FULL DESCRIPTION.

CORRESPONDENCE SOLICITED.

MANUFACTURED BY

HART & CROUSE.

UTICA, N.Y.

NEW YORK. 211 WATER ST. CHICAGO. 79 LAKE ST.



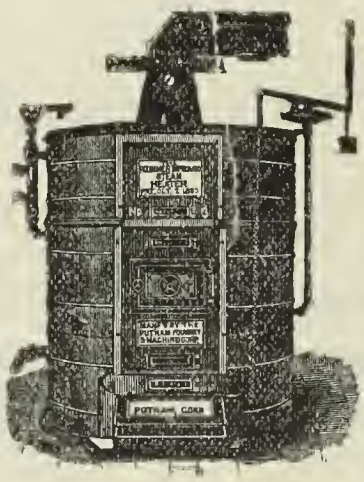
Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.





KEEP IN MIND

The Plummer

Steam Heater

AND

The Leader

Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,

PUTNAM, CONN.

— CRUELLY SURPRISED. — When the gentleman at the desk had attended to the cases of various applicants he turned to a pleasant-faced, well dressed man who was patiently awaiting his chance to get in.

"Well," he said to him with a smile, "what can I do for you to day?'

"Nothing," was the quiet response.

"Ah, that's pleasant; everybody seems to want some sort of a favor. Come in and sit down; you are a relief."

The pleasant-faced man bowed and accepted the invitation. "On the other hand," he said, when he was comfortably fixed, "I want to give you something."

"That's nicer than ever," smiled the host. "I've heard that it was better to give than to receive, but I've never had much chance to try both."

The visitor took a book out of his pocket.

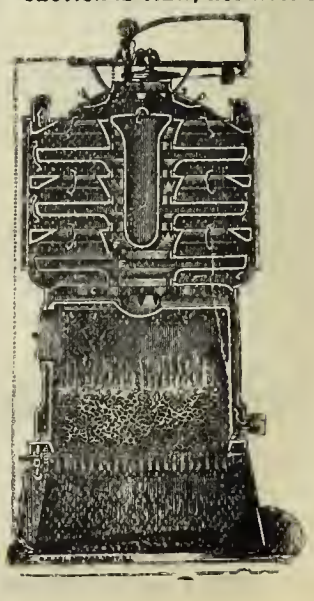
"I want to give you," he said, bowing again, "an opportunity to put your name down for the finest work ever sent out by any publishing firm in— " but he never finished the sentence.—*Exchange.*

THE VOLUNTEER

STEAM



SECTIONAL VIEW, Hot Water.



For hot water or steam has no superior, and is the only hot water boiler that is **SELF REGULATING.**

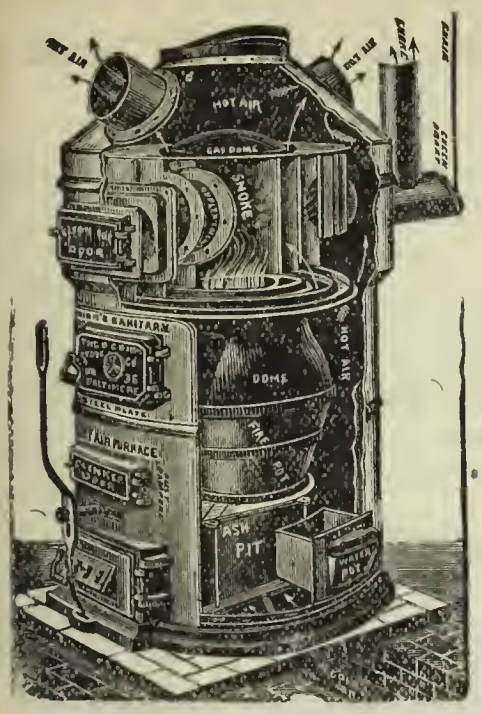
Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,

NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Street.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY
HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

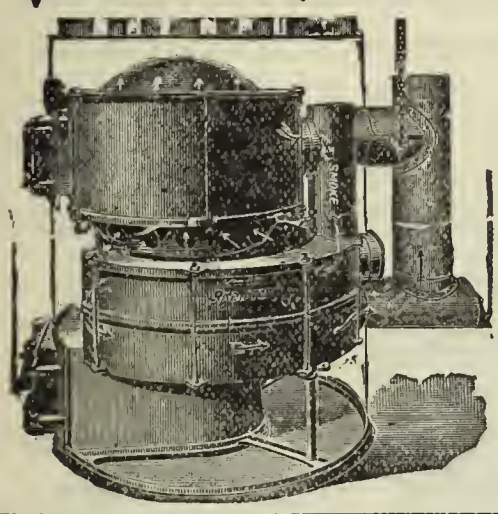
BIBB'S ORIGINAL

Baltimore Fire Place Heaters,

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

It Is a Base Burner.
It Is a Great Economizer of Fuel.
It Does Not Heat the Cellar
It Is a Low Furnace.

The "Perfect" Ventilator

The "Crown" or "Stasch" Folding Bake Pan.

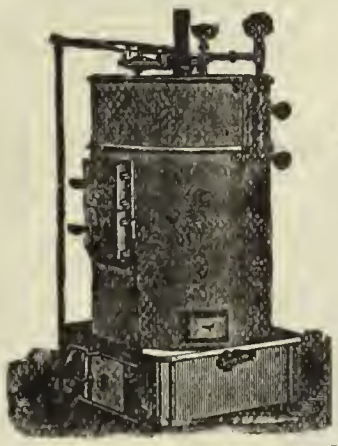
Agents Wanted. Address—
The CORNING MANUFACTURING CO.,
CORNING, N. Y.

Both Sides of the "Page."

FITTER'S SIDE:

Easy to Handle,
Quickly Set Up,
One Sale makes more.

Our Catalogue proves this side.

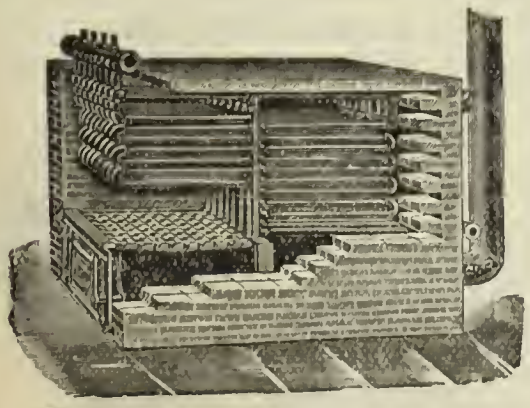


OWNER'S SIDE:

Little Fuel,
Much Heat,
No Repairs.

Our Testimonials prove this side.

W. C. MOWRY, Lock Box 314, NORWICH, CONN.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

Over 300 Different Sizes.

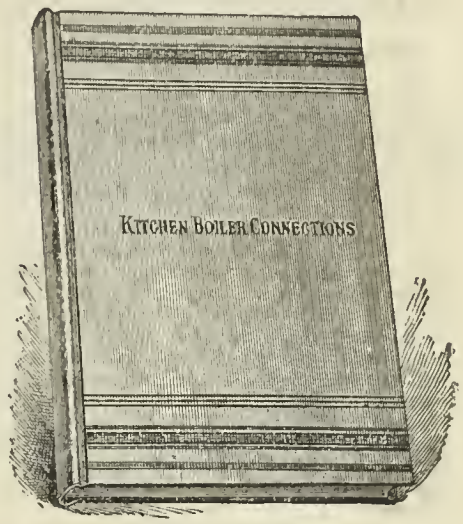
SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST.,
ROCHESTER, N. Y.
New York Office, 44 Dey Street.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth, Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student, and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

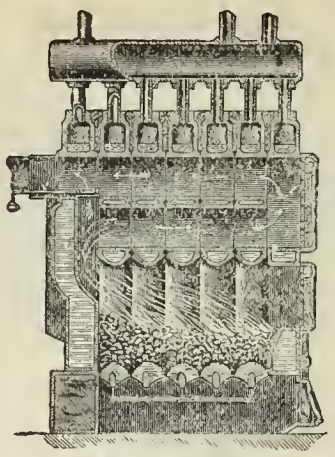
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

86-102 Reade St., New York.



MERCER BOILER.

The H. B. Smith Co.,

MANUFACTURERS OF

Steam and Water

HEATING APPARATUS,

For Public Buildings and Private Residences.

SPECIALITIES:

MERCER'S Patent Improved Sectional Boiler, for Hot Water and Steam Heating, adapted for hard or soft coal.
GOLD'S Improved Sectional Boilers.
MILL'S Improved Sectional Boilers.
THE UNION Hot-Water Radiators
REED'S Improved Cast-Iron Radiators.
GOLD'S Indirect Pin Radiators, with Nipple and Flanged Joints.
BRECKENRIDGE'S Patent Automatic Air-Valves.

Office & Warerooms, 137 Centre St., New York.

FOUNDRY, WESTFIELD, MASS.

STEAM HOT WATER WARM AIR

FOR HEATING ALL CLASSES OF BUILDINGS

Our LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

CAPITOL HEATERS

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best

—FOR—

Steam or Hot Water Heating.

—o—

Send for Catalogue.



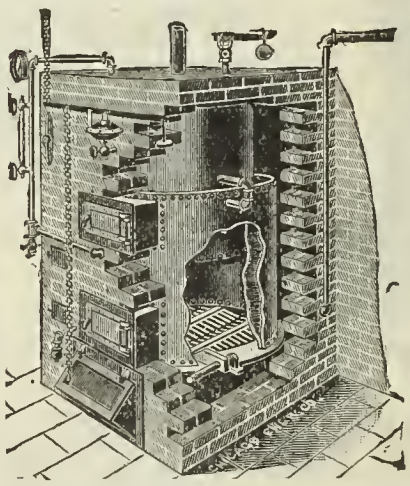
The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

Packed Joints.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use HARD or SOFT COAL.

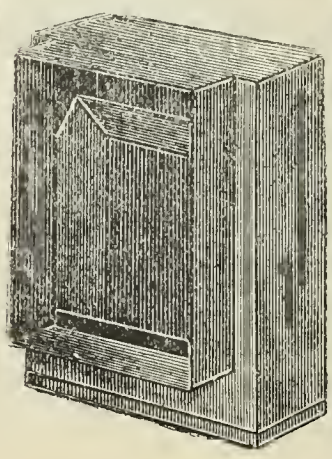
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



Novelty Ventilated Wall Pipe,

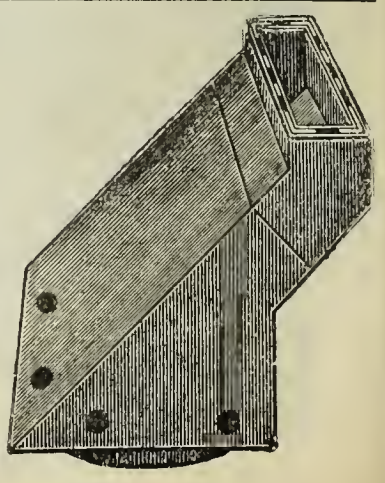
Absolutely Fire Proof.

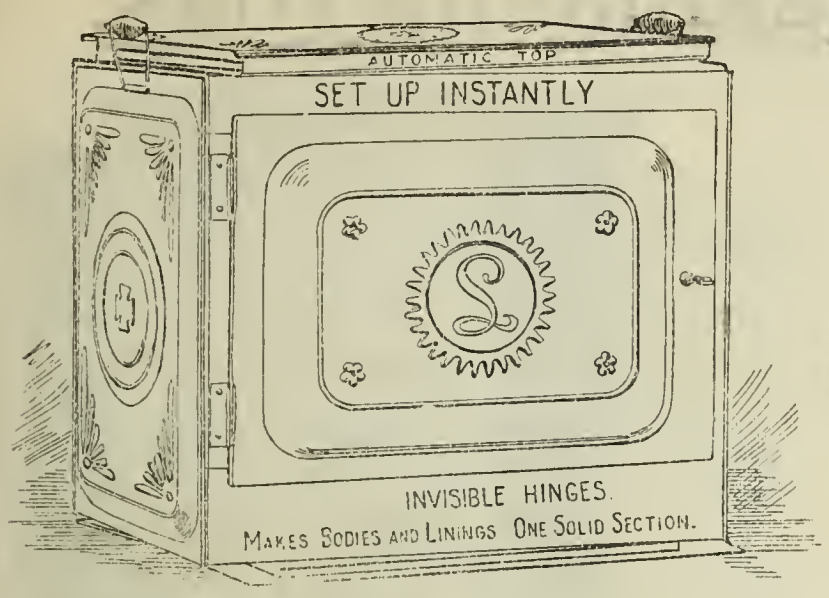
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 7 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER,

18 Wood Street, Pittsburgh, Pa.





SAVE FREIGHT!

Solid Folding Ovens.

Complete Assortments of Vapor and Oil Stove Ovens.

J. P. LINDEMANN & SONS,

MANUFACTURERS,

MILWAUKEE, WIS.

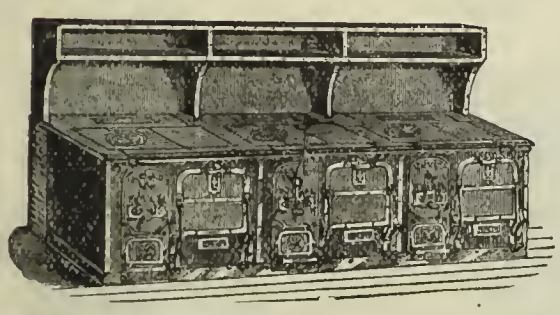
—— Send for Samples, Prices and Catalogue. ——

Established 1853.

V. CLAD & SONS,

117-119 South Eleventh Street,

PHILADELPHIA,



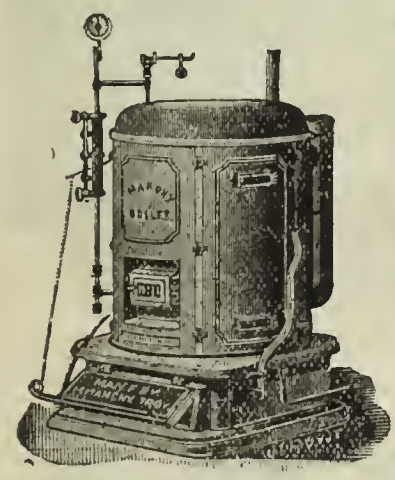
MANUFACTURERS OF

FRENCH RANGES, BROILERS

AND

Cooking Apparatus.

Catalogues and Price-Lists on Application.



THE MAHONY BOILERS,

For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



WHY IS IT

that the same dealers who sold the **Boomer Furnace** five years ago are still continuing its sale?

DID YOU EVER STOP TO THINK

that one or two years' experience with a poorly constructed light furnace always creates a demand for a furnace that has proven to be the best in the full sense of the word?

IF YOU WANT TO MAKE MONEY

buy the Improved Boomer Furnace, set it up right, please your customer, and you have the key to your future success.

REMEMBER

that a Boomer Fire Pot has never been known to crack or burn out. That it has the simplest and most effective Gas and Smoke Burner. Guaranteed the heaviest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS. Massillon, Ohio

MICA

MICA OF ALL GRADES

—FOR—

STOVES and Mechanical Purposes.

PALERMO MICA CO.,

Miners and Importers and Wholesale Dealers,

S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Prop.,
88 Fulton St., N. Y.

NEW HAMPSHIRE

MICA

IS THE BEST.

The F. E. BELDEN MICA MINING CO.,

12 Broad St., Boston, Mass.

Quartz Fibers.

The finest fibers said to have been ever made have been spun, says an exchange, by Professor Boys, out of quartz. This highly refractory substance, which requires to melt it a temperature greater than that developed in any furnace, when softened by the intense heat of the oxyhydrogen blow pipe, may be drawn out into threads of incredible fineness. Professor Boys manipulates it by using a cross-bow arrangement, by which a straw, used as an arrow, carrying a small bit of quartz rod, is joined to another rod of quartz by melting the point of contact. When the straw arrow is fired from the cross bow it draws out the quartz into a thread, which may be made of almost any desired thickness, of any uniform diameter, and remarkably strong, considering the fineness. Fibers 1 15,000 inch in diameter have been made, 100 of which only equal in size the thickness of a single silkworm's thread, and the ends as they are drawn out become so fine that they cannot be seen, even with the aid of the most powerful microscope, and are not thicker than 1-1,000,000 inch. A single cubic inch of quartz would supply sufficient thread to go around the world no fewer than 658 times—in other words, the length would be 16,450,000 miles.

— A Difficult Task.—"So you are a mind reader, are you?" said a very smart young man to an adept at that species of mystery.

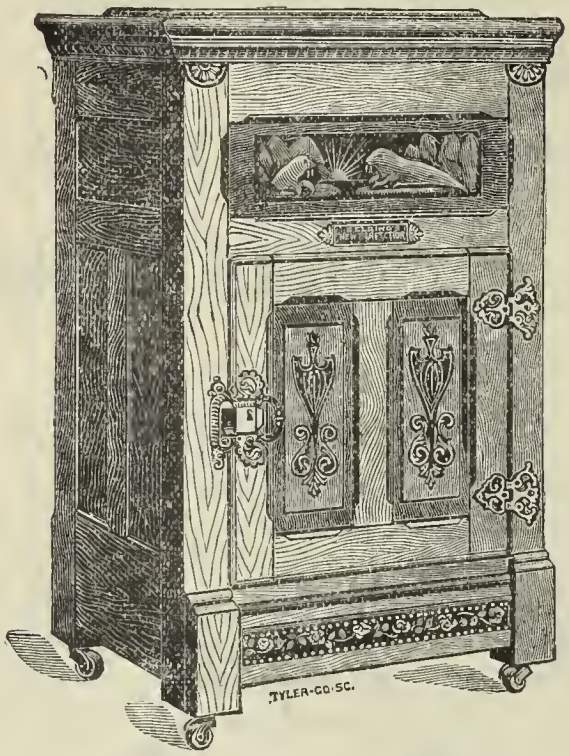
"Yes."

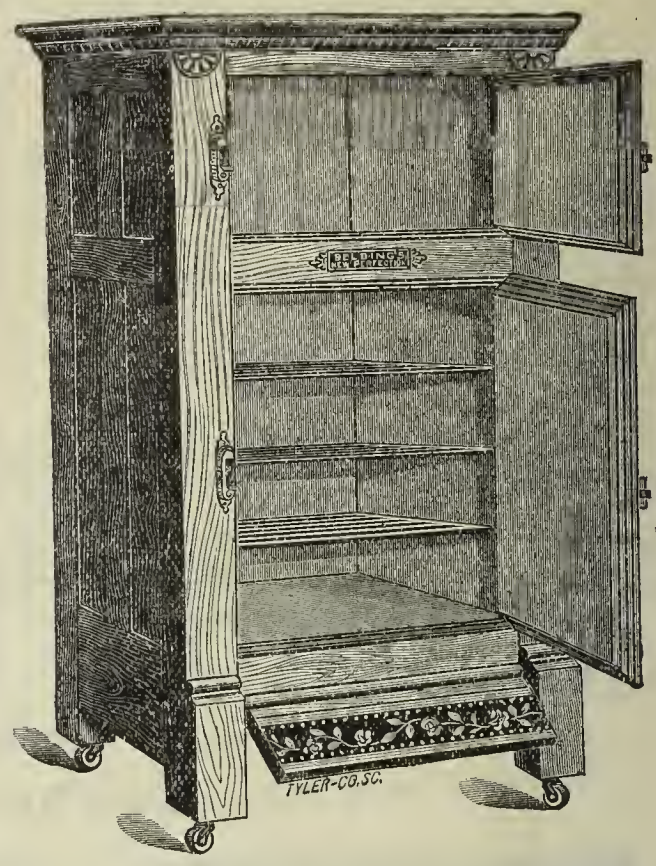
"Indeed! Then read mine."

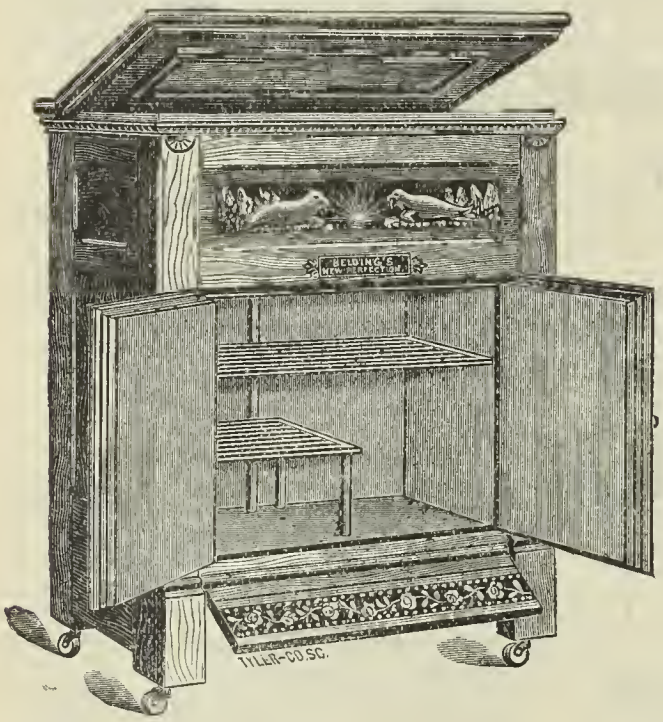
"Why didn't you bring it with you?"

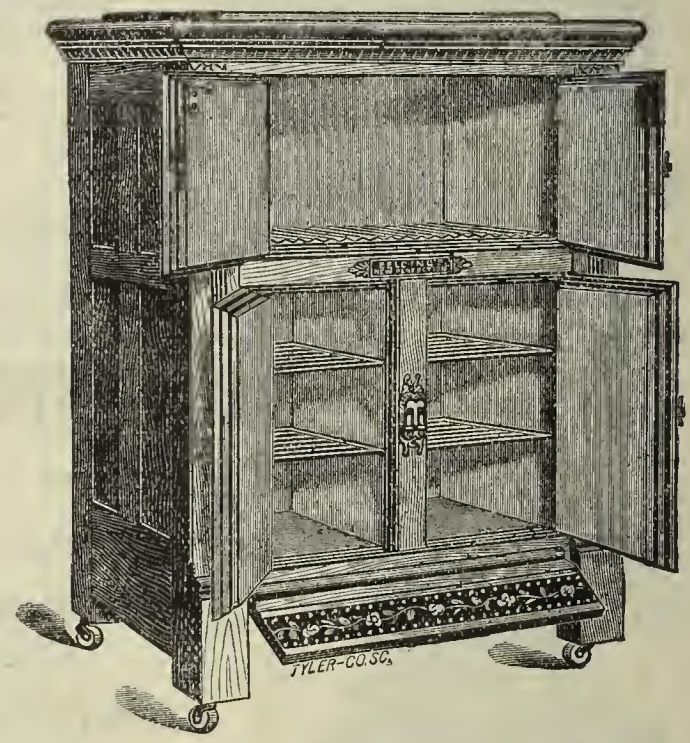
—*Exchange.*

BELDING'S REFRIGERATORS.

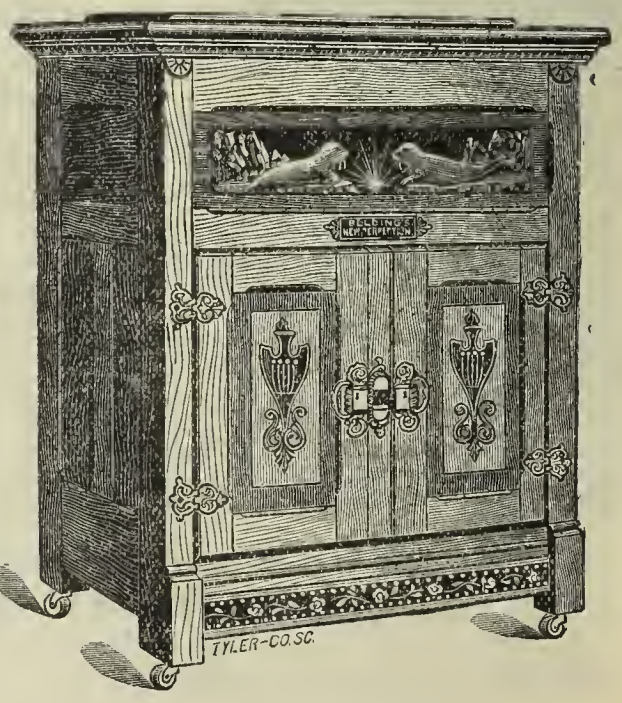




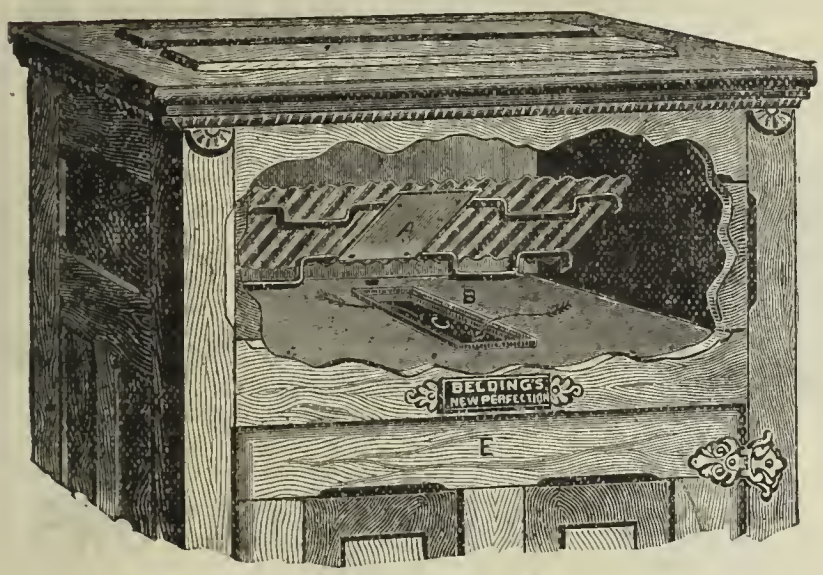




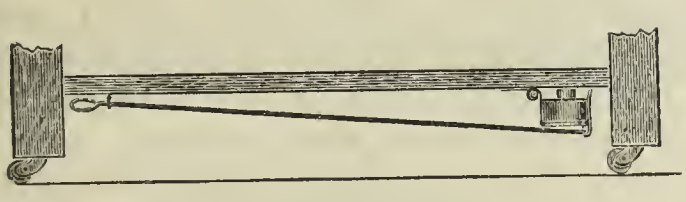


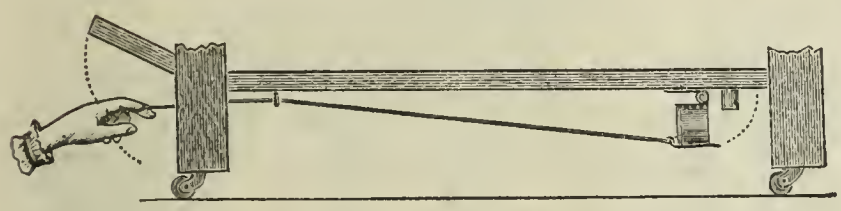


See Points of Excellence Over Others.



Patent Applied For.





OUR NEW AUTOMATIC COLD AIR DAMPER ATTACHMENTS.

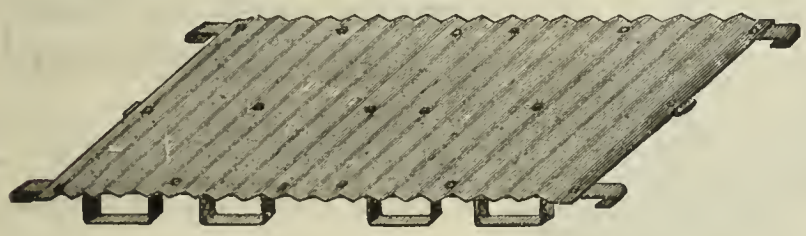
This cut shows a section of our Refrigerator with the New Automatic Cold Air Damper closed.

A—Represents Metal Ice Rack.
B—Bottom of Ice Compartment.
D—The **New Automatic Cold Air Damper.**
E—Door of Provision Chamber.

When the door of the Provision Chamber is opened the Cold Air Damper *immediately* closes the opening through which the cold air drops, thereby *instantly stopping the circulation* in the Refrigerator. Then, as the cold air in the Ice Compartment *cannot escape*, it is impossible for warm air to enter it through the flues in the sides of the Refrigerator; therefore, while the door of the Provision Chamber is open *no ice is wasted, no cold air escapes* and *no warm air enters* the Ice Compartment or *comes in contact with the ice.*

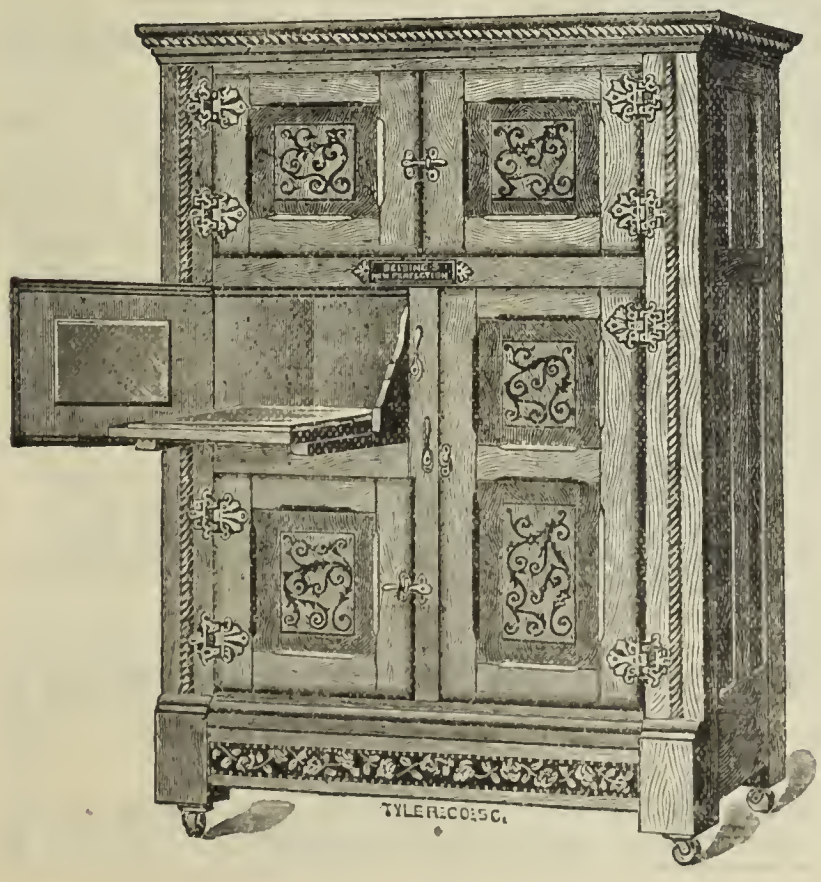
Thus it is clearly shown that this improvement is a *practical* one and makes our Refrigerators *consume less ice* than any that are now on the market.

OUR NEW DRIP CUP ATTACHMENT.



SOLID METAL ICE RACK.

No wood cleats to get water soaked and tainted.



All refrigerators **hardwood, antique finish.** We carry large stocks at all of the following places:

Belding Manufacturing Company.

Factories, Belding, Mich.

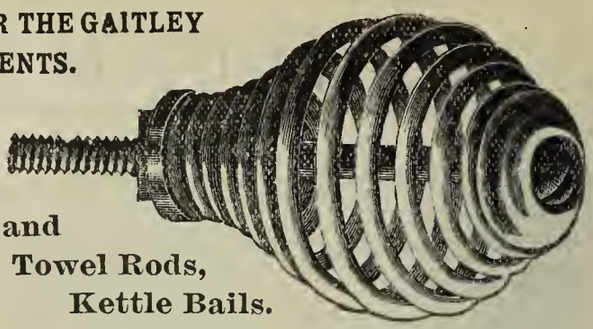
SALESROOMS AND WAREHOUSES:

Chicago, 223 5th Avenue.
New York, 260 Canal Street.
Philadelphia, 249 So. 2nd Street.
Boston, 90 Canal Street.
Holbrook, Merrill & Stetson, San Francisco and Sacramento, Cal., Pacific Coast Agents.

SEND FOR ILLUSTRATED CATALOGUE.



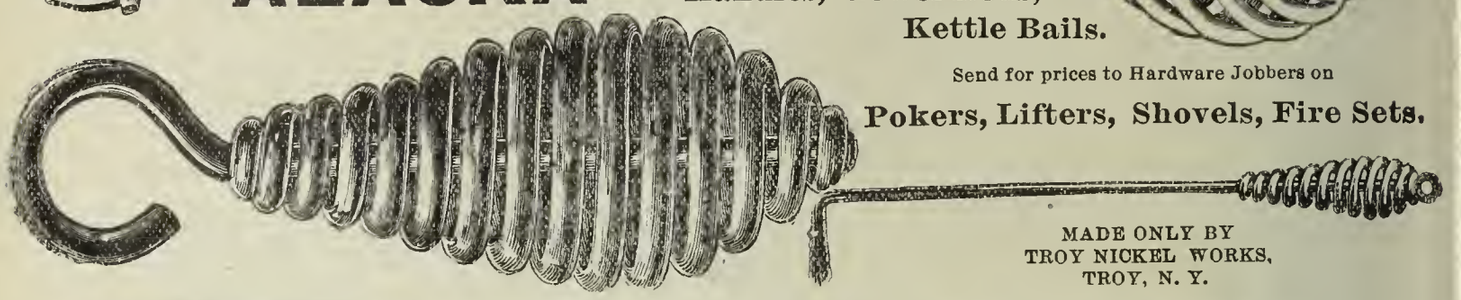
MADE UNDER THE GAITLEY PATENTS.



ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.

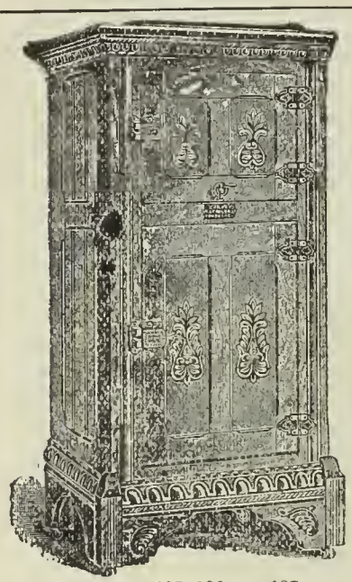
Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.



MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

"The Only Cleanable Refrigerator."



"Removable Galvanized Ice Compartment."

STYLE NOS. 125, 126 AND 127.

Gurney Patent REFRIGERATORS.

WE CLAIM FOR THE "GURNEY:"

"REMOVABLE GALVANIZED ICE COMPARTMENT."
"THE ONLY CLEANABLE REFRIGERATOR."
"CAN BE KEPT ABSOLUTELY PURE AND CLEAN FOR ALL TIME."
"THE LOWEST AVERAGE TEMPERATURE."
"THE GREATEST ECONOMY OF ICE."
"DRY AIR FREE CIRCULATION."
"PACKED WITH MINERAL WOOL (the best non-conductor.)"
"THE GREATEST SELLER."

The "Gurney" Proves what we Claim.

The following Jobbers will handle the Gurney for the Season of 1895:

The S. M. Howes Company, Boston, Mass.
A. W. Martin, Baltimore, Md.
Supplee Hardware Co., Philadelphia, Pa.
Bindley Hardware Co., Pittsburgh, Pa.
Frank Diel, Syracuse, N. Y.
McIntosh-Huntington Co., Cleveland, O.
Indianapolis Stove Co., Indianapolis, Ind.
Chicago Stove & Range Co., Chicago.
Freeman Delamater & Co., Detroit, Mich.
LLEWELLYN BONHAM, our New York representative, Room 52 Pierce Building, N. W. corner Hudson and Franklin Streets.
Robert Seeger, St. Paul, Minn.
A. J. Lindemann & Hoverson Co., Milwaukee, Wis.
King Hardware Co., Atlanta, Ga.
O. K. Stove & Range Co., Louisville, Ky.
Heckel Hardware Co., St. Louis, Mo.
Howard W. Peak, Fort Worth, Texas.
Richards & Conover Hardware Co., Kansas City, Mo.
Tolertou & Stetson Co., Sioux City, Iowa,
Rector & Wilhelmy Co., Omaha, Neb.
McDonald & Willson, Toronto, Ont.

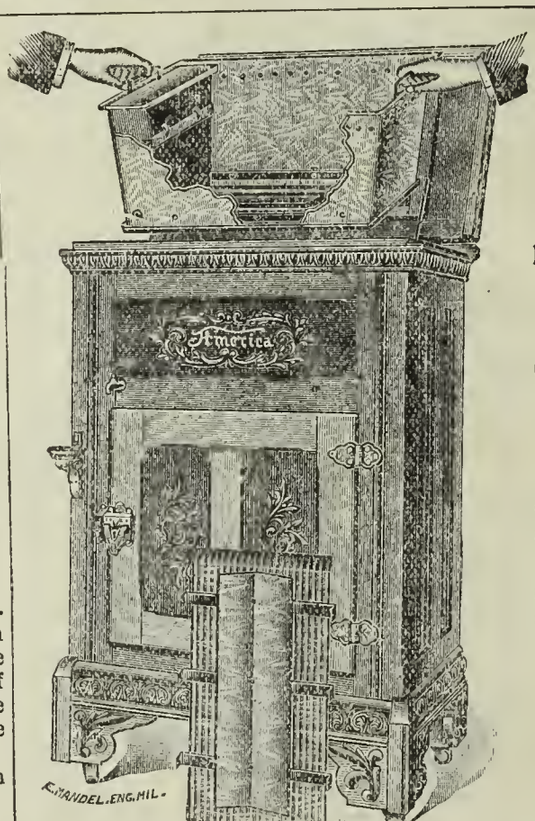
We want a jobber in every distributing point in the United States, and a dealer in every town and city. Write for catalogue, terms and discounts, and secure the agency.

Gurney Refrigerator Co., Fond du Lac, Wis.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE
THE BEST IN THE WORLD!
OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,
At LOWEST PRICES EVER KNOWN.
If your dealer does not have them, Send for Illustrated Circular and Price-List, to

JOS. W. WAYNE,
MANUFACTURER,
124 MAIN STREET, CINCINNATI, O.



The America!

GEM OF

REFRIGERATORS.

Patented Removable Ice Compartment.

Can be kept clean with the least trouble.

Its construction for cleanliness, drainage of waste water, circulation and insulation is perfect.

Write for catalogue and investigate our claims. It will pay you to secure the agency in your town.

THE

Bowen Manufacturing Co.,

FOND DU LAC, WIS.

MICA NORTH CAROLINA WYOMING, AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

— WENT HIM ONE BETTER — "Out in Oregon," said a man from that State, "the air is so clear that you can see the peak of Mount Shasta, in California, from the peak of Mount Hood, in Oregon, a distance of 276 miles."

"Here in the East we can see much further than that."

"Oh, come now."

"It's a fact. The moon is 240,000 miles away, but we can see it on a clear night." —*Life.*

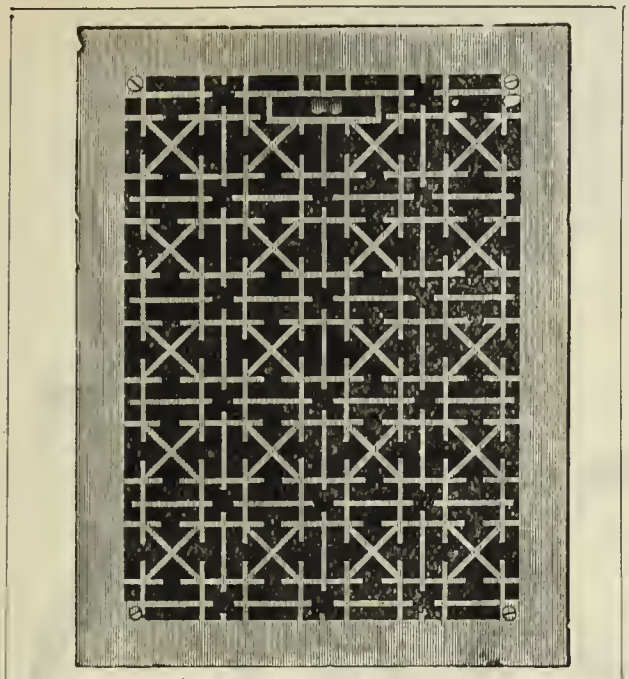
— CHINESE EMPEROR (nervously): "What news?"

Official: "Japan is now anxious for peace."

Emperor (gloomily): "Y-e-s, but how big a piece?"—*New York Weekly.*

TUTTLE & BAILEY MFG. CO.,

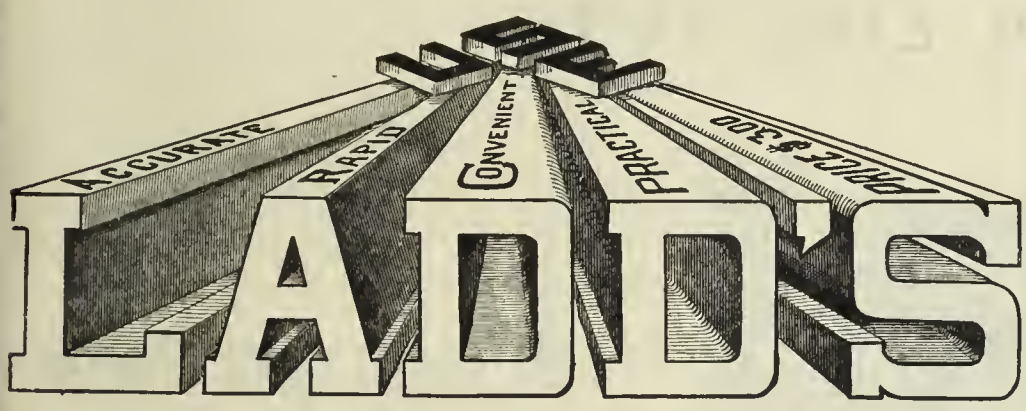
REGISTERS, VENTILATORS, &c.



JAPANESE DESIGN.

REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.



LADD'S

DISCOUNT BOOK.

PRICE, **$3.00**; DOUBLE INDEXED EDITION, **$4.00.**

Sent, postpaid, to any address upon receipt of price, by

DAVID WILLIAMS, Bookseller and Publisher,

96-102 Reade Street, New York.



THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

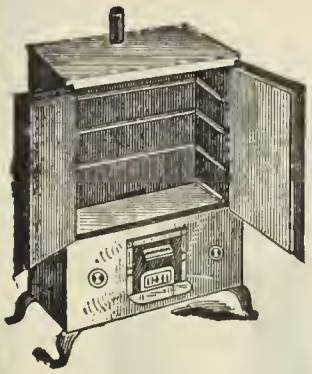
MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.



BLODGETT'S PATENT PORTABLE OVEN

—FOR—



Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

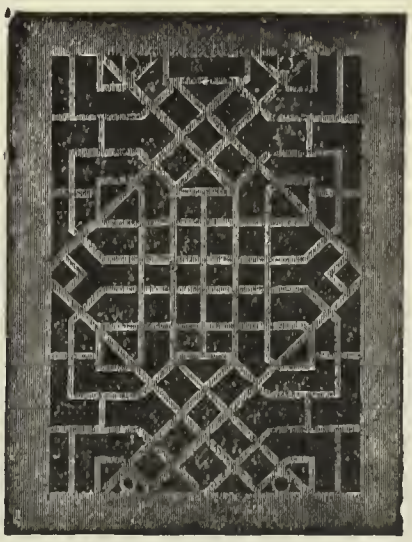
BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.

Burlington, Vt.



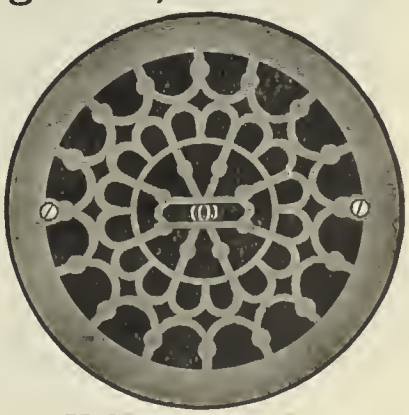
Warm-Air Registers, Ventilators, Etc. Hardware Specialties.

BUFFALO REGISTER WORKS,
480 and 436 Niagara Street, - Buffalo, N. Y.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers, Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.

— A STRONG RESEMBLANCE.—Funnyman : "See that young lady bicyclist in bloomers? Reminds one of a good advertisement, doesn't she?"

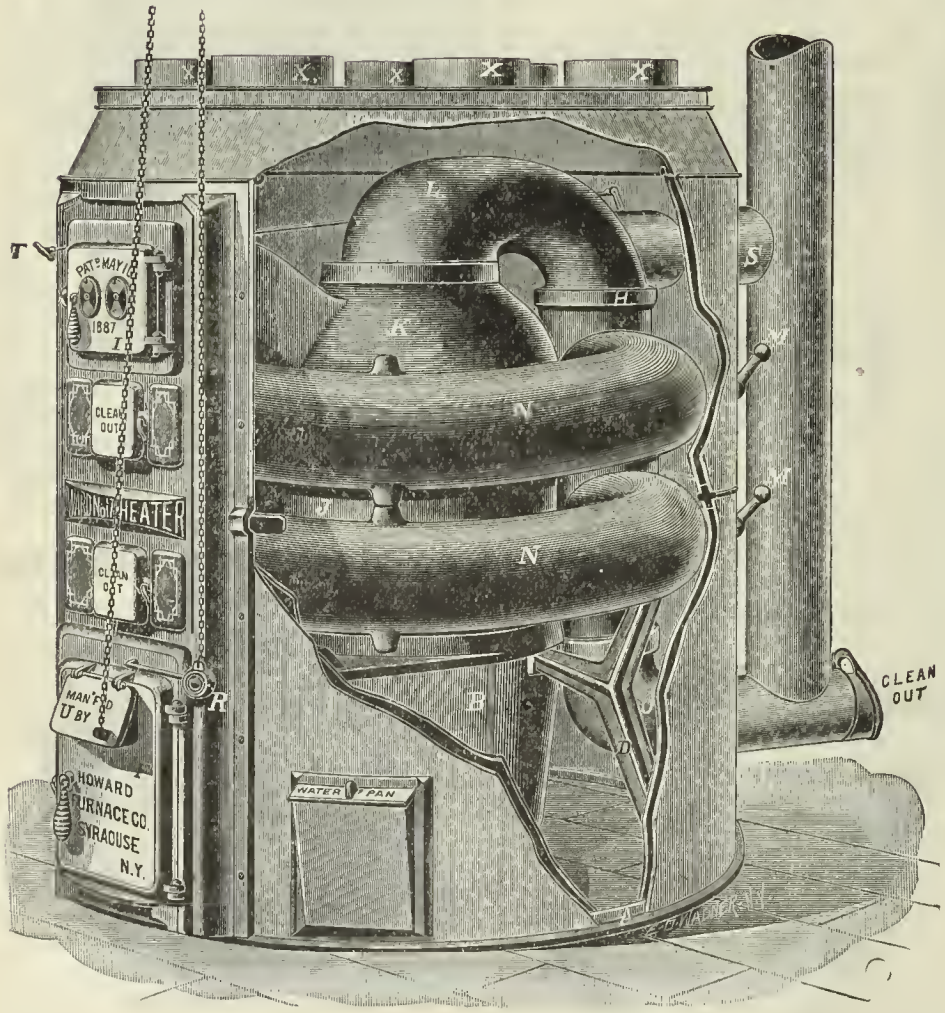
Dulhead : "How's that?"

Funnyman : Proportions are perfect and display is excellent."—*Printers' Ink.*

THERMAL
HOWARD
HEATERS
COMFORT.

MADE TO LAST

A LIFE TIME.



Smooth and Sound Castings

Made of the choicest iron and modeled with a view to withstand the severe strain of heat and cold. These are requirements which the Howard Heaters embody and are in themselves recommendations of lasting and life long qualifications.

MAIN OFFICE AND WORKS, SYRACUSE, N. Y.

HOWARD FURNACE CO.,

BRANCHES:

NEW YORK, BOSTON, GRAND RAPIDS, TORONTO.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, February 9, 1895.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 6.
Index to Reading Matter.....Page 57.

The Index of *The Metal Worker*. Volume XLII, July-December, 1894, is now ready and may be obtained on application to David Williams, publisher, 96–102 Reade street, New York ; or to 220 South Fourth street, Philadelphia ; Room 509 Hamilton Building, Pittsburgh ; 59 Dearborn street, Chicago ; Rooms 22–24 Pickering Building, Cincinnati ; Bank of Commerce Building, St. Louis ; 146 Franklin street, Boston, and 312 The Cuyahoga, Cleveland.

Hobbies.

There are hobbies and hobbies, hobbies useless and hobbies profitable, hobbies which are futile and trsnsient and hobbies which are of perennlal interest. But the value of a rational hobby to a busy man can hardly be overestlmated. To have some pursuit to care about and follow up, distinct from the particular business which constitutes the main work of his days, has a decided tendency for good on the well being not only of the young, but of the old. It fills up the spare moments of the boy or young man, keeps him from temptations out of doors and gives him something to thlnk and occupy himself about indoors. It keeps his mind from preying on itself and tends to broaden his character and his sympathies.

Their Good Influence.

The adoption of a hobby in early life, be it artistic, mechanical, llterary, sclentific, social or merely commonplace, leads more than often to pleasant intercourse and the companionship of kindred spirits to which the young man might not otherwise be able to attain. Possibly lt may afford an avenue to influencc or fame in after life, or, still better, it may open the door of opportunlty to minister profit or pleasure to others, making the man a blessing to his fellows, even to old age. Hobbies have helped many an old man to enjoy life snd keep his interest and intelligence keen to the end of his days. The man who has no special interest outside his daily business tasks is, as a rule, laying up for himself a miserable old age. It is pitiable to see how some men become completely absorbed in the business of money getting. Gradually their business absorbs more and more of their thoughts until at last they can think of or care for nothing else. Their minds narrow down to one groove, out of which they cannot escape. Then, when sickness or other cause cuts them off from active participation therein, they are bankrupt of interests, are lncapable of adopting new pursuits, and become a misery to themselves and all around them. Much of this mlght be avoided by the cultivation of a profitable hobby in early life.

News and Notes.

The powerful Britlsh battle ship "Msjestic" was launched at Portsmouth, England, on January 31. The "Majestic" is a twin ship with the "Magnificent," which was launched at Chatham on December 19. They are described as first-class barbette battle ships of 14,900 tons displacement; and are the largest British war vessels afloat. The "Majestic" was launched in the short space of 14 months from the date her keel was laid.

The difference between a practical man in an executive municipal office and the series of mere politicians who have preceded him is exemplified in the case of Colonel Waring, the well-known sanitary engineer, who has recently assumed the post of Street Cleaning Commissioner of New York City. Since his advent the city streets have been kept clean despite extremely trying conditions of weather, the snow being removed promptly instead of being suffered to lie untouched for days, as has been previously the case.

It has been found necessary to place additional steel girders in various portions of the new Public Buildings of Philadelphia in order to strengthen them.

The federation of all the Australian colonies was approved at a special conference of colonial government representatives held last week at Hobart Town, Tasmania.

Work has been commenced on the foundation of the new plate bending shop at the Brooklyn Navy Yard. The building, for which Congress appropriated $70,000, will be 200 feet long by 85 feet in width and will be constructed of steel.

The United States Minister at Madrid has cabled the State Department that the bill embodying the *modus vivendi* for restoring the former rates on United States exports to Cuba and Porto Rico has passed the Spanish Senate. The *modus vivendi* will operate until a definitive treaty on the subject is executed between the two countries.

A new locomotive apparatus for the purpose of liquefying snow and ice was tried with apparent success in New York City a few days ago. The machine is self propelling and weighs 8500 pounds. It converts the snow into water, which is immediately turned, after the manner of a sprinkling machine, into the gutters wlth sufficient force to carry it into the sewer openings.

A committee of nine prominent citizens has been nominated by Mayor McKenna of Pittsburgh to investigate the improvements most needed in that city, and it is proposed to issue $5,000,000 worth of bonds to carry out these improvements.

The plate glass manufacturers of the United States are said to be about to form a new combination, avoiding anything in the nature of a trust. The capital stock will be about $10,000,000.

The statement of mill construction in the United States for 1894, given by the *Textile World*, indicates a material falling off in this field of industry. Along with a serious decrease in cotton mill building, however, there is stated to have been considerable enlargement of existing plants. The new spinning mills projected for this year are, moreover, decidedly more numerous than those planned at the beginning of 1894. On the other hand, of textile mill constructlon in general, the impression is conveyed that an increase in new construction is not expected for the coming year. The statement of new textile mills constructed and spindles added in each of the last three years is as follows:

	1894.	1893.	1892.
Cotton.....	23	52	73
Woolen.....	17	33	49
Knitting.....	40	53	49
Silk.....	11	15	21
Miscellaneous.....	23	19	36
New spindles added..	422,000	600,000	1,100,000

The January Treasury statement shows a phenomenal loss of $41,500,000 in the Government gold reserve during the first month of the year. At this rate the reserve would be obliterated by the beginning of March.

The presldent of the Amalgamated Iron and Steel Workers' Association of Pittsburgh has reported to the Treasury Department that he has reason to believe that tin workers from Wales and elsewhere are preparing to come to this country under contract to take the place of American workmen who are reslsting a proposed reduction in their wages.

Arrangements have been completed this week for the starting of a line of steamers to run from Portland, Ore., to China and Japan, in connection with the Oregon Railway & Navigation Company. The Great Northern is said to have a share in the scheme.

The State Gas Inspector of Indiana, whose office the Legislature has decided to abolish, has made public the statement that Indiana's natural gas supply, at its present rate of consumption, will be exhausted in four years.

THE LETTER BOX.

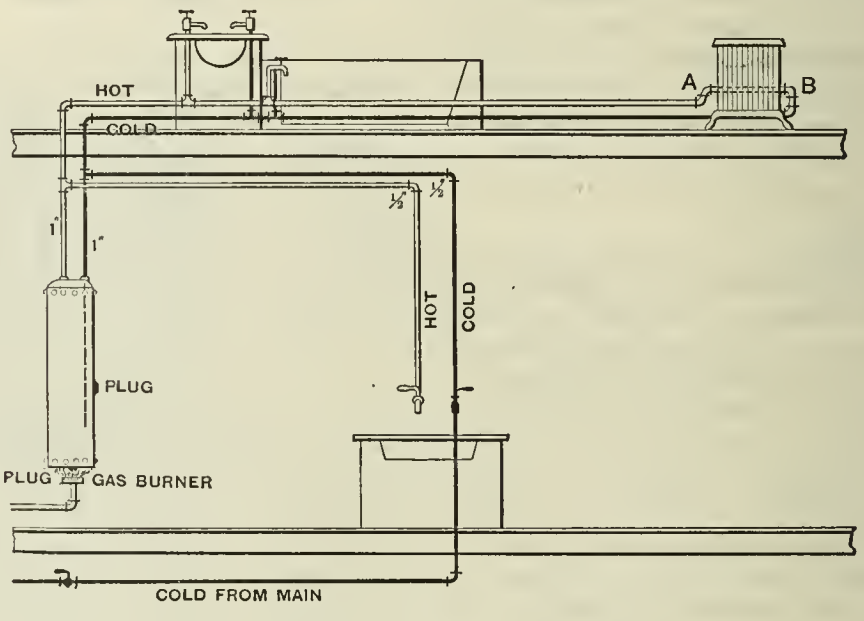
Driven Wells.

From F. R , *Ohio.*—Please advise me whether drive wells are used in Canada and England to any extent. Also about how far it is to water, as a rule, and to what soils the wells are adapted ?

Answer. — Drive wells are used in Canada and England to a large extent. Since its first introduction for private water supply following its invention and use for military water supply by Colonel Green of the Seventy-sixth New York Regiment during the Civil War in 1861, the system of driven wells has spread almost into universal use. It was adopted as a military resource by the British army in its expedition to Abyssinia (1867), and was named in England "The Abyssinian pump," and was also carried into Algiers by the French army of occupation. As an adjunct to a moving army in an enemy's country the system at once became a permanent safeguard for the supply of pure and wholesome water, free from the perils of pollution by an enemy, and, in fact, is no less a safeguard for every one dependent upon an open well as against accidental or intentional pollution. From its military publicity its use spread to a large extent in England and her dependencies, to the Continent and we may say throughout the civilized world, to India and even now to the wilds of Ashantee, as a part of the French army commissary. In fact there is scarcely a recognized nation among whom this system of obtaining water is not known. It is estimated that the number of driven wells furnishing fresh and wholesome water in the United States has reached the 1,000,000 mark. Any soil that a pointed pipe can be driven into and that contains a water stratum within 30 feet from the surface is suitable for driving a well tube for a common pump connection. Where the water stratum is at a greater depth, up to, say, 40 feet, a well pit to allow of placing the pump chamber and bucket down to the water drawing distance is in order. For greater depths the deep driven well system of the American Well Works, Aurora, Ill., and the Cook Well Company of Chicago and St. Louis, are types of the best method for economical water supply from deep driven wells. The only difficulty in driving well tubes is found in the boulder drift, where large boulders sometimes obstruct the way, which should only cause a loss of time in drawing the tube and driving again in a nearby place. In some instances this has been done several times with, possibly, the loss of a tube before a successful well is obtained. Not only is the drive well used for a new water supply, but it may be used to great advantage for the reinforcement of old wells that lose their water in dry seasons, as described and illustrated in *The Metal Worker* of July 21, 1894. The gang system of driven wells, consisting of a number of pipes driven in lines at distances of from 25 to 50 feet apart, and all connected to a suction line pipe and to a pump, has become one of the leading features of the present water supply for cities and villages in the United States and other countries.

A Faulty Arrangement of Piping.

From J. H. D., *Richmond, Ind.*—I would be pleased to have *The Metal Worker* give me some assistance in a matter which is causing me considerable trouble. I have a plumbing job which at times runs warm water from both the hot and cold faucets. I have had another plumber look the job over who points out several defects, and I have been advised by him to consult *The Metal Worker* for a remedy. The sketch shown herewith indicates the arrangement. Both of the faucets at the washstand give hot water at the same time, although sometimes one is hot and one cold, and the faucets at the bathtub act in the same way. The radiator has no valve to shut off the circulation through it, yet it never gets more than lukewarm. There are only two pipes going to the bathroom and they both leave the top of the boiler in the kitchen. No means have been provided for emptying the boiler, a plug being placed in both the bottom and side connection, as the boiler is heated by a natural gas burner placed beneath it. The water in the boiler seems to get thoroughly hot.



A Faulty Arrangement of Piping.

Note.—Some of our readers may have suggestions to offer for changing the piping of this job. It is a simple matter to provide means for emptying the boiler. The plug can be taken out from the bottom of the boiler and a pipe run from it to the trap under the sink, having a stop cock placed near the boiler to prevent the water wasting. The trouble at the faucets is caused by what ordinarily would be a cold water service pipe being used as a return pipe from the radiator. The hot water that flows from the cold water faucets is forced to do so by the cold water stopping the circulation in the heating system and driving all the hot water out of the faucet when opened—that is, in the pipe between where the supply pipe connects with the return and the faucet. This can be overcome by using a separate return pipe from the radiator and carrying it down and connecting it at the side of the boiler where the plug has been placed. This will make the cold water service entirely independent of the hot water to the faucet and the heating system. The failure of the radiator to heat may be due to the size of the pipe leading to it. This pipe should be continued 1 inch in size all the way to the radiator, and the return pipe should be 1 inch all the way back to the boiler.

Size of a Gallon.

From J. E. K., *New York.*—Please inform me through *The Metal Worker* what is the size of a gallon of water, and what it weighs per cubic foot? I have had an argument with a friend and told him there are about 7½ gallons of water in a cubic foot and that the

weight was about 56 pounds. He said there were 6¼ gallons and the weight was 62 pounds. Please tell me which was right.

Answer.—Our correspondent will be surprised if we tell him that both of the statements are right—that is, the United States gallon contains 231 cubic inches, and accordingly there are 7½ or, exactly speaking, $7\frac{1}{2}\frac{1}{3}\frac{1}{1}$ gallons to the cubic foot. The imperial gallon, which is the old standard and the one used in Great Britain, contains 277.274 cubic inches, and, therefore, a cubic foot is equal to 6.23 imperial gallons. We do not quite understand our correspondent's reference to weights. The weight of a cubic foot of water is about 62⅜ pounds—that is, it varies from 62.417 pounds at 32° F. to 59.7 pounds at 212° F. A gallon according to this would weigh a little over 8 pounds.

Rusting of Gutter Outlets.

From E. F. B., *Greenville, Pa.*—I would like to be informed through the columns of *The Metal Worker* why the tubes soldered on hanging gutters rust out before the conductor. Is there any remedy?

Answer.—The outlet tube, which is soldered to the under side of a hanging gutter, is usually made tapering, so as to slide into the connecting elbow or pipe some distance. As the tube is tapering, it may be possible for water to be held by capillary attraction between the two, and thus cause the tube, and perhaps the connecting part of the elbow, to rust. If this be the cause, the use of well coated heavy tin for the outlet and connecting joint would be an advantage. If any of our readers have encountered this difficulty they are requested to give their opinions on the subject.

Insufficient Air Supply.

From G. & W., *Elkhart, Ind.*—Noticing the letter of "A.H." of Milwaukee in *The Metal Worker* of December 15, on an insufficient air supply, I was much interested, as I have a similar problem. One furnace among a half dozen which we have set just like the one reported, with a single exception, acts in a similar way. The furnace is of ample size, two 8 inch pipes connecting with 3½ x 10 inch stacks leading to the second floor. One 8 inch and four 9 inch pipes lead to registers in the floors for heating the first floor. The furnace sets over a pit, with a cold air trench 12 x 24 inches in size leading to it. My carpenter, in connecting the wooden box from the window to the trench, incressed the size at the lower end so that it is 12 x 30 inches. I do not know whether this is the csuse of the furnace becoming excessively hot or not. The cold air window opens to the north and the furnace faces to the south, and the pit beneath the furnace is 30 inches in diameter. The furnace does not furnish enough heat upstairs for the amount of coal consumed. I have a 9-inch return pipe from the first floor to the base of the furnace, taken in through the casing. The hot air pipes, with one exception, lead to the southwest, east and northeast, one 8-inch pipe only running to the northwest. If you can give me any information on this subject it will be esteemed a favor. It seems to me that in the case of "A. H." his 10 x 12 inch pipes are larger than necessary, and surely the 5 x 13 inch stacks are too large for the cellar connections to them.

Answer.—In figuring up the area of the hot air outlets we find that they amount to 402 square inches, while the area of the cold air supply amounts to 268 inches, which is less than it should be. It is a common practice, as winter draws nigh, to see that all windows and doors are tightly closed, which prevents the escape of air which is already in the room, and prevents the entrance of the hot air which must come in to heat the rooms comfortably. If the doors all through the house were open, the 9-inch return pipe might be of some assistance in heating the house, but the trouble seems to be that the cold air tube is too small to properly supply the pipes, and there is not sufficient outlet for the air that is already in the house to escape and make room for the warm air to enter to heat the building.

Estimating Labor in Pipe Fitting Contracts.

From E. S., *Cincinnati, Ohio.*—Will *The Metal Worker* please inform me how time or labor on a steam or hot water heating plant is estimated? The principal information I want is the number of feet of pipe a man is supposed to lay in a day of ten hours.

Note.—This is a question that we would be pleased to have the readers of *The Metal Worker* discuss at some length. Some of the old rules that applied to laying gas pipe were adapted to piping heating plants in the early days of the business, and some rules existed in reference to the running of cast iron pipes when all the joints were made by rusting. But these are not applicable to the work as now done. A common rule is to estimate the time required by the number of radiators used. On small heating plants, where there are from six to eight radiators used in connection with the boiler, it has been usual to calculate from one and a half to two days' work for a pipe fitter and helper for each radiator in hot water work. Steam work is done sometimes on the one-pipe system, sometimes on the two-pipe system, and the labor required ranges from one to one and a half days to a radiator connection. On larger jobs, where 20 or more radiators are used, the time is materially shortened, so that hot water work may be reduced to one and a half days and steam work to one day, or even less. This method of calculation does not consider the possibilities of having to make special runs around obstructing girders or other constructive peculiarities of the building or cutting through walls.

Chimney Sweats.

From F. W. H., *Lafayette, Ind.*—Will *The Metal Worker* please describe a remedy for a chimney that sweats so badly that the condensation runs down the wall and looks like tar on the ceiling of the room? On the outside the chimney is wet and fairly steams. The chimney is in a two-story brick house, having a furnace which is connected to it by means of a smoke pipe and uses natural gas as a fuel. The chimney is in the north wall of the building. I have cut a hole in the wall of the chimney near the top of the second story with no beneficial results.

Note.—As the dimensions of the chimney are not given it is difficult to state what causes the trouble. It is certain, however, that cutting a hole in the chimney was a step in the wrong direction, and if the chimney steams on the outside it is fair to suppose that the chimney is not air tight, which it must be to be satisfactory in operation. Gas apparatus does not require so large a chimney, as a rule, as coal apparatus, and it is fair to suppose that the products of combustion condense before escaping from the chimney and cause the trouble reported. It is more than likely that the chimney has been used for other fuel in the past, and the condensation is colored by the refuse from the previous fuels. It is quite probable that better success can be secured with the apparatus and the trouble avoided by running a pipe inside the chimney clear to the top, and if the pipe is put together in the reverse of the usual way condensation will run down inside of the pipe to the bottom.

Barker's Chimney Top Ventilator.

From H. W. M., *Wadsworth, Ohio.*—Please inform me if there is a patent on the chimney top made like the sketch inclosed? The top is described as a sure cure for low smoky chimneys.

Answer.—The sketch in our correspondent's letter shows Barker's chimney top ventilator, which was patented October 27, 1879. G. E. Barker, St. Lawrence, S. Dak., and H. W. Barker, 7820 Wallace street, Chicago, issue licenses to manufacture under royalty.

The water supply of the city of Brooklyn has of late been of such poor quality that the citizens were not surprised when Health Commissioner Emery issued a formal notice to the householders that the water, as it enters their houses, is unfit for potable purposes, and must be thoroughly boiled before use. Analysis of the water showed it to be largely impregnated with vegetable matter and mud sediment. It is believed that the recent storms have affected the supply, the melting snow carrying deleterious substances with it into the ponds from which the supply is drawn. In many cases the pipes have become clogged, and an eel was found a day or two ago in a water pipe in the Twenty-third ward of the city.

The city government of Camden, N. J., have contracted with the Dixon Crematory Company of Findlay, Ohio, for the erection of a garbage crematory at a cost of $10,000.

ROOFING AND CORNICE.

The Evolution of an Old Building.

The adaptability of sheet metal for architectural purposes has been demonstrated during the past 15 years by the extent of its adoption. Numbers of new buildings in all parts of the country have exteriors composed entirely of sheet metal. Old and dilapidated structures of wood or brick, too, may be modernized and improved by the use of sheet metal applied in the form of plates, and in this direction a practically unlimited field is open to the metal worker. The manufacture of sheet metal plates in iron steel and copper for architectural purposes has already become an important industry, and manufacturers have brought their productions to such a state of perfection that material of all kinds is now so closely imitated in metal as to make actual examination necessary to discover the substitution. The endurance of the plates has been severely tested, and has proved to be such as to warrant their use in any and all climates, and they have been adopted in many cases in preference to stone or brick as successfully withstanding climatic and atmospheric influences.

To give an idea of their usefulness in the renovation of old buildings, we present a series of illustrations showing the different stages in the evolution of an old building to one embodying modern ideas of architecture. Fig. 1 is a view of an old three-story brick building recently purchased by Gara, McGinley & Co., Philadelphia, and known as 23 South Seventeenth street, in that city. The firm mentioned have been identified with the growth of the architectural branch of the sheet metal industry for many years, and they conceived the idea of transforming the old building into one of modern appearance in order to practically demonstrate their abilities in this direction. Fig. 2 shows the windows removed and the side doors bricked up. The window openings are not enlarged, and beyond the bricking up of the doors no change in the appearance of the building is noticeable. In Fig. 3 it will be seen that the third story was obtained by squaring the peak of the house. The work was rough, no pointing or finishing being required, and the bricks were taken from an old wall at the rear of the house. Fig. 4 shows the method of putting on the metal plates. The bricks are first plugged, that is, wooden plugs are driven into the mortar for use as supports or nailing surfaces for the wooden strips to which the plates are attached. The window arches are formed on the wide strips seen above the old windows. The upper story has been treated with a coating of red lead preparatory to painting. Fig. 5 shows the finished building. The walls

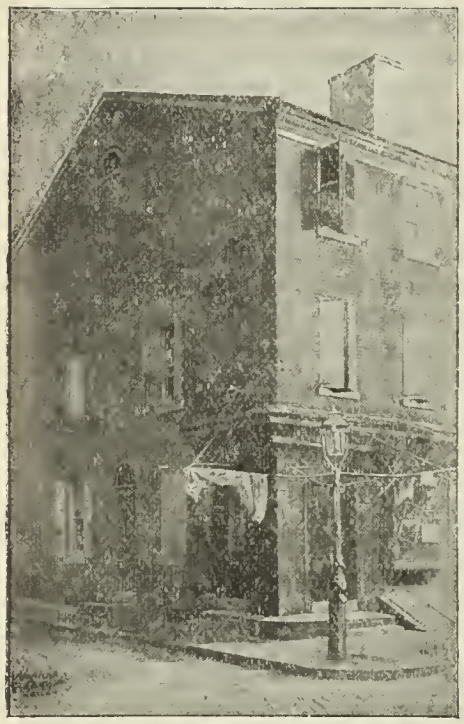


Fig. 1.—View of Old Building.

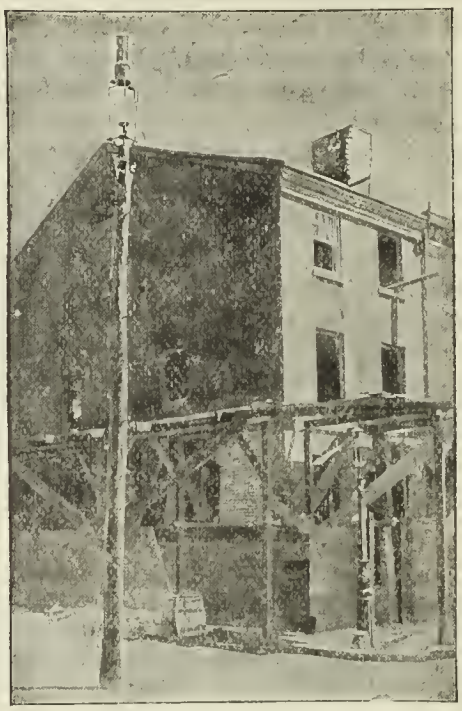


Fig. 2.—Windows Removed and Doors Bricked Up.

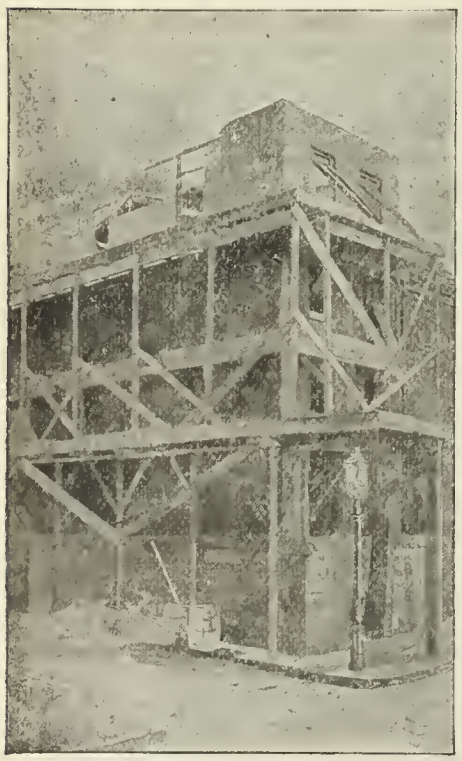


Fig. 3.—Completing the Third Story.



Fig. 4.—Putting on the Metal Plates.



Fig. 5.—Finished Building.

of the two upper stories are covered with rock faced siding plates; those of the second story from the top to the lower part of the arches with tiling plates, and the remainder with pick faced plates. The upper story is painted to represent Indiana limestone, and the lower stories represent red sandstone.

FLASHINGS.

"GALVANIZED IRON CUSHION" is the curious but unexplained title of a little pamphlet that reaches us from the Apollo Iron & Steel Company, Pittsburgh, Pa. It is a remarkably neat little publication, with merely the three words mentioned on the front cover. On looking within it is discovered what the phrase refers to. It is a cushion which is placed between the sharp end of the band and the sheet of galvanized iron, acting as a washer and preventing the top sheet from being injured. Illustrations of the cushion are shown, and the pamphlet further goes on to tell of the advantages of the Apollo iron.

GEO. A. OHL & Co , Newark, N. J., have recently completed and shipped to the Kinnear & Gager Company, Columbus, Ohio, a new machine for decorating sheet metal by indentation. By varying the pressure widely different effects can be gained in the appearance. The machine will work sheet metal up to 36 inches wide, and the process of decoration is completed in one operation instead of several, as formerly.

G. MOSER & SONS have moved into their new offices on the fourth floor at 225 West Second street, Cincinnati, Ohio, their increase of business having compelled them to enlarge their press rooms, which now take in all of the fifth floor of the building. Among extensive contracts that the company have recently completed was one for $1000 worth of dies for the Metallic Cabinet Company of 92 Elm street, Cincinnati, for the manufacture of metallic furniture. Messrs. Moser & Sons do a large export trade, having within the past few weeks received three direct orders from Australia for tin tags, and have secured a contract from a large firm in St. Louis for supplying their entire requirements for 1895, which will amount to about 150,000,000 tags.

THE LUFKIN RULE COMPANY, Saginaw, Mich., have announced a considerable reduction in the price of their Magic pattern rule. a device patented five years ago, and which has had a very extensive sale. The rule consists of a bar marked in circumference inches on the front, and in inches and eighths on the back, and two slides, with set screws, into which trammel points are fastened. For laying out elbow patterns the left hand slide is fastened to the end of the bar by the set screw, and the right hand slide is set according to the diameter of the elbow desired. A flexible steel ribbon on the top of the bar is then raised to the required hight, according to the angle of elbow wanted, this hight being read from a chart furnished by the Lufkin Rule Company. The chart is 19 x 23 inches in size, mounted on linen, and contains besides the elbow diagram, rules for cutting all kinds of flaring, oval, cylindrical, cone shaped vessels, &c., with the aid of the Magic pattern rule. The rule can also be used for a straightedge, circumference rule and trammel.

THE FIRM of Welteroth & Brand, Williamsport, Pa., have been dissolved, the business to be continued hereafter by Joseph Welteroth.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

H. A. R. DIETRICH, Bethlehem, Pa., the steam heating and hot water contractor, has completed the steam heating plant in the Municipal Building. The second boiler was put in recently.

J. J. HOGAN, New Haven, Conn., is overhauling the plumbing in Thos. Kelly's building, putting in new fixtures.

THE SCHOOL BOARD of Springfield, Ohio, is advertising for bids for heating the Lagonda Building.

AT A MEETING of the Board of School Government last week B. G. Carpenter & Co., Wilkes-Barre, Pa., were awarded the contract for heating the new Grant Street School Building for $2750.

HULETT & HAY of Racine, Wis., have been awarded the contract for putting the steam heating plant in the Racine Court House at $1788.

A NEW HEATING APPARATUS is being put in the Union School Building, at Cooperstown, N. Y. J. Yates of Schenectady is supervising the work.

E. W. BECK & Co., Derby, Conn., have the contract for heating the Congregational Church at Shelton.

THE New Haven *Record* says : J. A. Campbell & Co., New Haven, Conn., have the contract for the plumbing for a two-family house for T. Coyle.

THE COMMISSIONERS OF PUBLIC WORKS, Milwaukee, Wis , are advertising for plans for a $12,000 school building that is to have a plumbing, lighting and heating system.

THE THOMPSON MFG. COMPANY of Lancaster, N. H., are putting in a steam heating plant for Pattee & Clark.

M. J. KIBBE, New Britain, Conn., has the contract to do the plumbing and gas fitting in the new house of W. H. Cadwell.

THE ATTAWANGAN HOUSE at Danielsonville, Conn., is to be remodeled and to have a steam heating plant.

AN APPROPRIATION of $2000 has been made for heating and making some other improvements in the County Children's Home at Norwalk, Conn.

THE ARNOLD COMPANY, New Haven, Conn., are plumbing the new Borges flats on State street, each flat having bath tub, lavatory and water closet, Peck Bros. & Co.'s fixtures being used.

THE FOSKETT & BISHOP COMPANY, New Haven, Conn., have been awarded the contract for plumbing the new Winchester Building on Orange street. The Durham system will be used, with Meyer-Sniffen fixtures. There will be 22 water closets, 29 basins and 11 urinals, the contract price being between $7000 and $8000.

THE EXETER MACHINE WORKS, Boston, Mass., are furnishing one 24-section Exeter boiler and a carload of Exeter radiators for the Armsby Block, Worcester, Codding & Taft, Worcester, being the contractors. Among other orders is one for a 16 section Exeter boiler and a carload of Exeter radiators for the E. W. Miles Block, Brookline, Mass., where Kenrick Brothers are doing the work. They are likewise furnishing a 12-section boiler with radiators for the George P. Staples & Co. Block, Washington street, Boston.

THE POWERS REGULATOR COMPANY, 36 Dearborn street, Chicago, are to place their automatic heat regulators in four of the city school buildings.

THE L H. PRENTICE COMPANY, 203–205 Van Buren street, Chicago, are to furnish the Reliance Building, State and Washington streets, with the Paul system of circulating exhaust steam without back pressure.

THE J. L. MOTT IRON WORKS, 311–313 Wabash avenue, Chicago, are to furnish 14 No. 4 and 1 No. 5 Sunray hot water boilers for the stations of the Metropolitan Elevated Railroad. This order, in connection with one previously received, makes 31 Sunray heaters that are to be used in the stations.

THE FULLER & WARREN COMPANY, 147–149 Lake street, Chicago, have contracts for warm air heating in the following residences ; Frank Wessman, 171 Baxter street ; F. G. Maher, 5112 Union avenue, two furnaces; E. Garrison, Rogers Park; M. L. Greely, Winnetka.

DONNELLY & BURKE, 187 Columbus avenue, New York, are doing the plumbing in three flat houses for Edward Kilpatrick.

HARDWICKE & Co., Niagara Falls, N. Y., have just closed a contract with the State authorities for the heating of the new armory of the Hornellsville Separate Company.

GLINES & KEELER, Hudson, Mass., have received from the William H. Page Boiler Company three sectional boilers, which they are to put into the blocks of C. L. Woodbury Sons, E. P. Lawrence and C. W. Holden of Hudson.

HILLS & FOX, Hartford, Conn., have the contract for the plumbing and gas fitting in one of the new fire engine houses at Hartford, Conn. The contract for the same work in the other house has not yet been let.

GEO. L. ROOD, 79 Lake street, Chicago, is to place a Prince Royal warm air furnace in the residence of E. F. Wilbur, Winnetka, Ill.

D. S. RICHARDSON, representing the New York Central Iron Works, Geneva, N. Y., presented the delegates to the plumbers' convention, at Waterbury, Conn., with a pocket comb and case bearing the suggestion, "Get this through your hair." "There are 20,000 Dunning boilers in use."

ZIEGLER BROS., plumbers and steam fitters, Elgin, Ill., have completed a large steam job in Ackemann Bros.' block, and have under contract a water works job at Carpentersville for Mrs. G. P. Lord. The job consists of two power pumps of 5000 gallons per minute each.

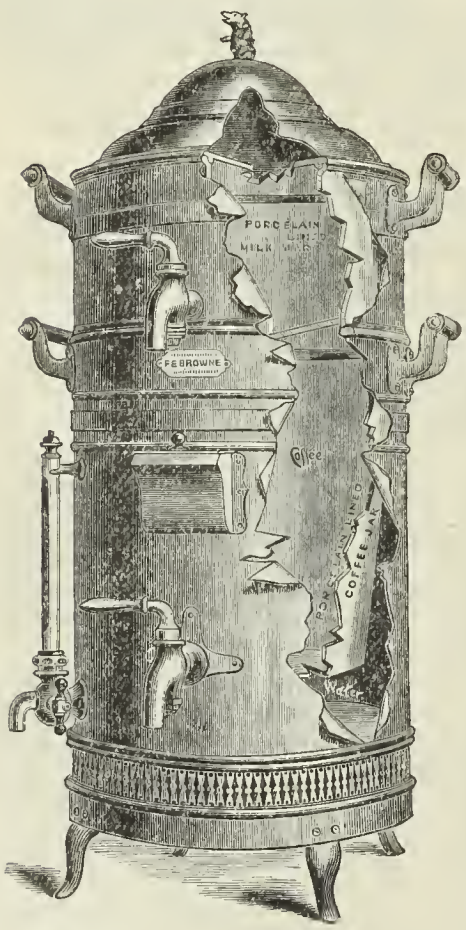
THE MCCORMACK STEAM HEATING COMPANY, Wallingford, Conn., have been awarded the contract for heating the new Gay flats on Chapel street, New Haven.

J. C. Walsh of Chicago, known to many of our readers as a manufacturer of gasoline torches, was killed last week by an explosion of gas at the Gaynor Hotel. A few years since he was severely injured by an explosion of gasoline.

THE RETAIL STORE.

Browne's Tea and Coffee Urn.

A tea and coffee urn combining a number of interesting features of construction has lately been introduced to the trade by F. E. Browne of 314–316 South Spring street, Los Angeles, Cal. The urn is intended for use in hotels, restaurants, coffee houses, &c., and reference is made by the manufacturer to its elegance and economy. The construction is such that there is no metal in contact with the milk or coffee, as the jars of the urn are made of cast iron lined outside and inside with porcelain, and the bottom is so arranged as to completely drain the jar. The urn is provided with a flat cast iron porcelained cover which fits both jars and is designed to be used on either. In the engraving presented herewith the cover is shown provided with a copper or nickel plated dome or ornamental top to prevent the radiation of heat. Portions of the sides of the urn and jars are broken away for the purpose of showing the interior arrangement. Each jar is incased in a highly polished heavy copper or nickel plated casing, that of the coffee jar being water tight and forming a water reservoir and

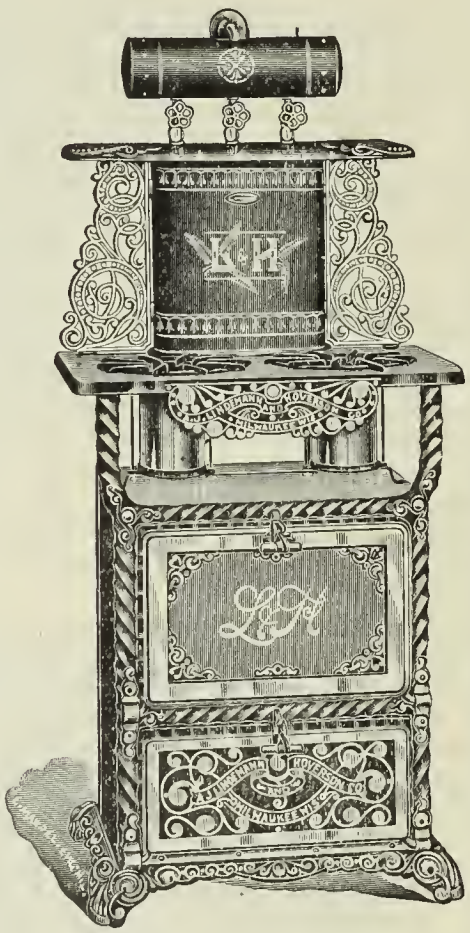


Browne's Tea and Coffee Urn.

steam chamber around it. The coffee or tea is heated through the medium of water and steam and is brought nearly, but not quite, to the boiling point, so that the contents of the jar will retain its aroma and flavor for a number of hours. The urns are so constructed that worn faucets can be quickly and easily replaced at small expense. The coffee jars have a capacity of 5 gallons and the milk jar of 2½ gallons.

The L. & H. Process Stove.

The A. J. Lindemann & Hoverson Company, 223 Reed street, Milwaukee, Wis., have brought out a new process stove, of which the cabinet style is illustrated in Fig. 1 of the cuts. It has a large, high shelf, a large oven and is neatly trimmed and richly decorated throughout. Among other special features the oven shelf is peculiarly worthy



The L. & H. Process Stove.—Fig. 1.—Front View of Cabinet Style.

of notice. This shelf is made on an original plan, of wrought iron, so that it is not only very light and strong but will not break if it should fall. A single strip of metal is used, which is bent into the necessary shape of an oven shelf and riveted at the sides so as to form a rigid piece of work. This cabinet stove is made with two top cooking holes two top holes and step, and three top holes and step. The company also manufacture process stoves with open frames in all sizes.

The burner used by this company is of original design, covered by their own patents, a sectional view of it being given in Fig. 2. The subflame is in a heavy bell shaped casting, surrounded by a chamber, in which air is heated and forced up to the carburetter. On the admission of gasoline into the carburetter it drops on a number of vertical corrugated strips of metal, where it becomes volatilized and commingles with the heated air. No asbestos is used to absorb the gasoline and no material is introduced for the purpose of saturation. The manufacturers state that by this means all smell is avoided when the valves are closed and the burners extinguished. They also claim that the direct supply of heated air forced to the carburetters

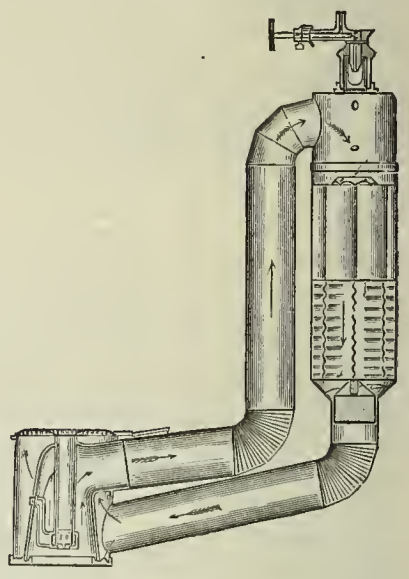


Fig. 2.—Sectional View of Burner.

greatly increases the calorific properties of the volatilized gasoline.

MEMORANDA.

The Niles Mfg Company of Niles, Ohio, are meeting with a gratifying demand for what is known as the Crusty Bread Pan. Those who have handled it speak in high terms of its merits, and the manufacturers are looking for an extensive trade in it. The pan is made of cold rolled steel, with a smooth finish, and measures inside 4x14 inches. The bottom of the pan is curved, and the corrugated ends are flared sufficiently to allow the pans to be nested for shipping. The curved bottom is claimed to have the merit of retaining the moisture, so that the bread is much more satisfactory than would otherwise be the case. The makers state the shape and size of the pan is such that the loaf is thoroughly and perfectly baked to its center, while producing a sweet, crisp crust over the entire surface.

W. P. Phillips & Co. and Webb, Stevenson & Co., Nashville, Tenn., have consolidated their stove and tinware businesses under the style of Webb, Stevenson & Phillips.

Royal & Slusses, dealers in stoves and tinware, Hawknisville, Ga., have gone out of business. They are succeeded by W. E. Greyson.

The Torrance Iron Company, Troy, N. Y., are putting on the market a new mop wringer which they claim "wrings the mop without a slop."

The John Tobin Mfg. Company, Newark, N. J., are issuing a circular of their Best Coffee Pot, claiming that it makes coffee that is as clear as wine, in

a minute. It is made of planished tin and provided with a patented device for straining. The pot is said to be quite popular and having a run wherever introduced.

WILLIAM GILMORE has purchased the interest of William Randall in the Randall & Ward stove truck concern at Le Roy, N. Y. Hereafter the firm name will be Ward & Gilmore. The retiring partner, Mr. Randall, will give his entire attention to the manufacture of wire fence.

THE PARTNERSHIP existing under the firm name of C. C. Smith's Sons Company, 301-303 Wabash avenue, Terre Haute, Ind., was dissolved by mutual consent on Monday, January 28, Edwin F. Spottswood retiring from the concern. The business will be continued by A. N. and H. S. Smith, who assume all indebtedness of the company and to whom all accounts and notes due are payable. The company are extensive dealers in stoves, ranges, furnaces, mantels and grates, hardware, agricultural implements, &c.

PRICE & POLK, Jackson, Tenn, dealers in stoves and tinware, have dissolved partnership. Thomas M. Polk will continue the business.

H. F. LIVERMORE & Co., 34 Oliver street, Boston, Mass., will look after the New England States business of the National Wringer & Mfg. Company, Canton, Ohio.

The Art of Display.

BY FOSSIL.

The desire for "showing off" is inherent in human nature, being as old as original sin. We may imagine that the primitive Edenites, when the matter of their first clothing was considered, had some regard to the color and fit of their fig leaf garments; also conclude that the universal interrogation: "How do I look?" arises from our common heredity. The motives for attracting favorable attention are various, but perhaps that which leads to "pear in' out" and "walkin' pride" is the earliest acquired. In maturity we transfer a portion of the inbred personal pride to a pride of pocket, and study how we can best fill the same through inducements to the purchasing public. From this arises "advertising," which is an important business motor and recognized in its many forms as a necessary factor in desired success.

It is the purpose of this paper to refer to that form of advertising which consists of showing the thing rather than telling about it. It has been said that "figures don't lie," but it is generally considered that this reputation for veracity does not extend to oral or written statements; also skeptical people say that the proverb only applies to lay figures; therefore, as "seeing is believing," it is pertinent to the subject to offer an opinion as to the way of making our display magnetic, or in common phrase to draw trade. He who calls attention to his place of business by an attraction which is entirely foreign to his trade, may succeed in enlisting the interest of curiosity, which may be desirable if it leads to anything better, but often it is like a bare polished hook which fishes may possibly admire but do not bite at. That showing which excites curiosity, but does not satisfy it, is to be preferred, because it invites to a further investigation and perhaps contact with the offered temptation, which is more likely to change the possible into a probable customer. A passing traveler once saw the tail of a calf protruding through a hole in a door. Having his curiosity awakened, he came to the conclusion which the evidence seemed to justify and applied at the door for further proof.

"Where is the calf?" he inquired of the occupant "I was wondering how it got through so small a hole."

"That is my sign." said the other, "and this is the office of my tannery. I can show you some good leather, &c"

The story does not tell if a sale was made or not, but the unique sign caused two movements toward it. It is doubtful if any display can long retain the attraction of its initiative, for we are not favorable to anything stale either to see or to eat. The adage, "A thing of beauty is a joy forever," will not apply to those stereotyped window dressings which the passerby gets as familiar with as with his own old clothes. For this reason there are few illustrative signs that do not become monotonous after a contined acquaintance, and liable to another proverb, "Familiarity breeds contempt."

The three balls of the pawnbroker and the wooden effigy of the tobacconist are recognized as legitimate trade-marks, but there is nothing inviting about them, and they only give us the pointer we are looking for. In front of a store in incognita there may have been seen for years back, and perhaps now, if it has survived exposure, a counterfeit small boy that was supposed to hint at clothing for sale. This inanimate youth always wore the same faded suit and ancient covering because his owner saw no use in exposing anything new to the street dust. The boy marked a place to trade, but did not invite it. Of course the average dealer does not display after that fashion, but not a few incline toward it. Perhaps the successful artist of display should be born, not made, but he who can engage a curiosity that stops to see, an interest that leads to investigation and a desire to possess, is likely to have a satisfactory result.

Reading Stove Dealers' Association.

The Stove Dealers' Association of Reading, Pa, recently held their fourth annual banquet in the new annex of the Café Bissenger, in the city named. The association was formed for the mutual benefit of those engaged in the retail stove and hardware trades, and for the purpose of maintaining uniform prices on the goods handled. At the banquet in question representatives of both the Reading Stove Works and the Mount Penn Stove Works were invited guests, the toastmaster being Charles A. Prizer of the former concern. At 8 o'clock the members and their guests sat down to a bountiful spread, which was excellently prepared and splendidly served. The decorations were entirely unique in their way and consisted of a display of tinware and stove supplies, which, according to a local paper, "would have stocked a small shop." In the front the center of attraction was a tin man, the hat being a tin kettle, the head a tea kettle, the body a lard can, the legs stove pipes and the arms pint measures, funnels and scoops. It was made by Lewis Dauth and William T. Hain and was the subject of no little comment on the part of those present.

The members and guests found at each plate a miniature article of tinware attached to baby ribbon, which they tied in the lappel of their coats. By a singular coincidence, though it might have been a joke, says a local paper, Charles S. Prizer found a miniature tin cup at his plate and he was dubbed the original tincupper of the Eighth ward.

President Bitting occupied the place at the head of the table, and on either side sat ex-presidents Milton H. Schnader and Wm. T. Hain. When the covers were removed Charles S. Prizer was introduced as the toastmaster, and in a few pleasing remarks he introduced the new president, Wm. H. Bitting.

Toastmaster Prizer called upon the following members, who responded: Lewis Dauth, an honorary member, who has a voice of good range; M. H. Schnader made a grate speech; Walter S. Prutzman spoke on poker, iron and otherwise; Wm. S. Rapp, Wm. T. Hain, Grant Nagle and Harry E. Richards also fired up the members with good speeches. The toastmaster, at the conclusion of the speeches, tendered the thanks of the association to Mr. Bissinger, to which the latter fittingly responded.

Those present were: W. T. Hain, Lewis Dauth, Harry E. Richards, John P. Dauth, William Bridegam, U. J. Mast, Milton H. Schnader, Grant Nagle, Charles Nagle, Willis Bridegam, Arnold Dauth, William B. Yeager, Jacob Otto, Walter B. Prutzman, F. Wagenhorst, Wm. H. Bitting, T. G. Hill, N. Lewis, J. L. Fett, N. Homan, Wm. T. Crosby, Chas. Fredericks, R. A. Rankin, J B. Ganter, James Hafer, J. Luigard, R. W. Poff, John Bewley, A. DeWitt, Birdesboro; H. C. Geissler, Harry Geissler, Samuel Geissler, Geo. Ritter, Geo. Hassinger, Wm. S. Rapp, Chas. B. Prizer, Charles Williamson, Robert Shick, E. Painter, John Hentzell, Chas. P. Hoffman, Adam Kolb, Henry Speice, Christian Geissler.

The committee consisted of Wm. T. Hain, Lewis Dauth and Harry E. Richards.

The officers of the Association for the ensuing year are: William H. Bitting, president; Charles Markley, vice-president; Harry E. Richards, secretary, and William T. Hain, treasurer.

United States Consul Lathrop, at Bristol, England, in a report to the Secretary of Agriculture gives some interesting information relating to the corn importing countries of Europe, from which it appears that eight countries imported during the fiscal year ended June 30, 1894, over 134,000,000 bushels of corn. Of this amount the United Kingdom took over 70,000,000, and Germany nearly 33,000,000 bushels; France took 10,500,000, and Holland and Austria Hungary each took 6,500,000; Belgium took nearly 5,000,000, and Denmark and Switzerland 1,750,000 bushels each. The bulk of the corn imports of Great Britain comes from the United States and Roumania, Russia, Canada and Turkey being drawn upon to make up about one-fourth of the supply. Nearly half the corn imported into Germany comes from the United States.

It is announced that the naval programme approved by the British Cabinet involves the construction, within the ensuing financial year, of four first-class, four second-class and two third-class cruisers, 20 torpedo boats and 20 torpedo boat destroyers. The cost of these vessels will aggregate about $32,500,000.

STEAM AND HOT WATER.

Heating from a Coil.

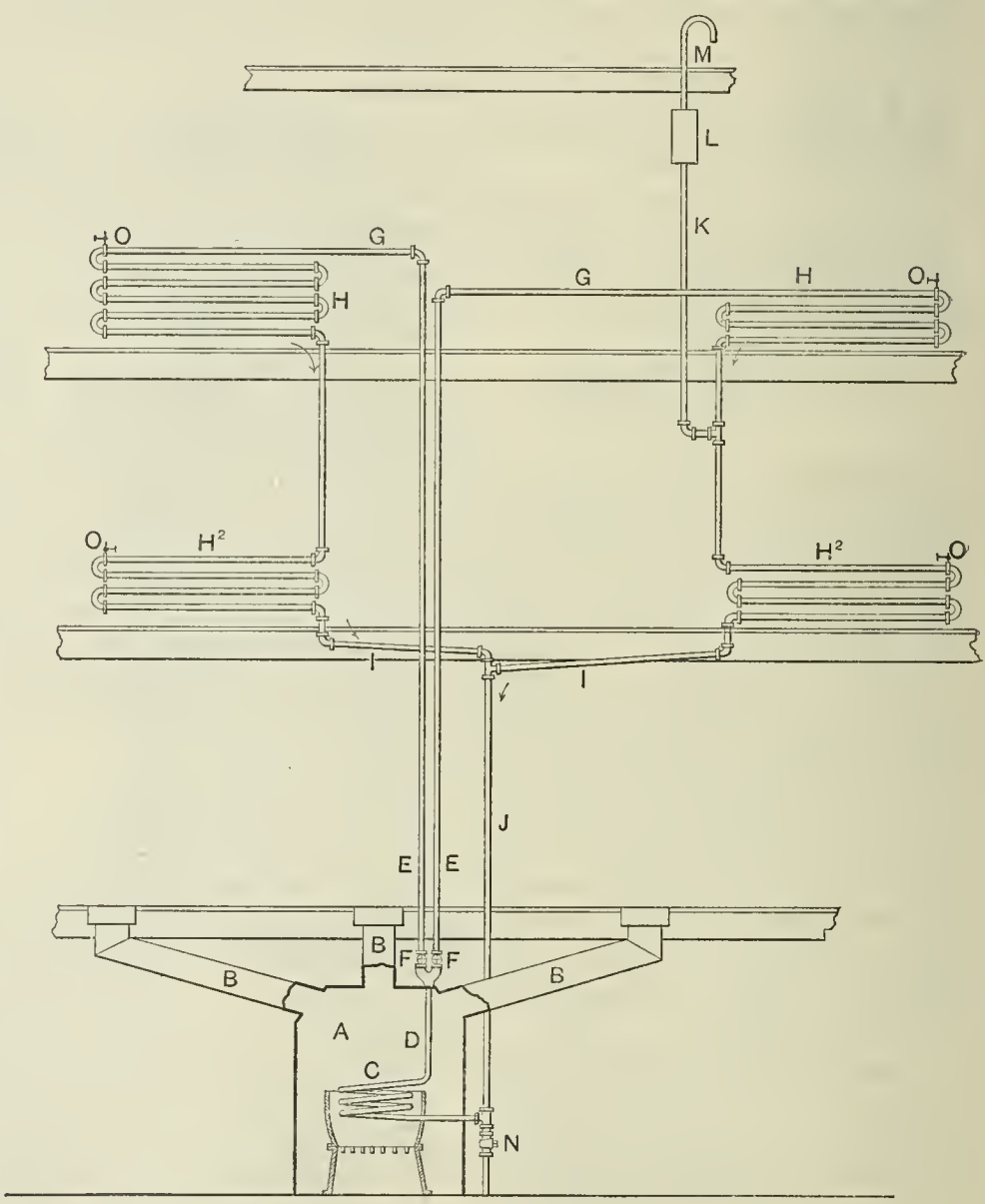
From C. A. W., *Chicago, Ill.*—I would like to learn through *The Metal Worker* how to pipe a room for heating it with hot water to secure the best results. The room is located over a store in which there is a large heating stove. I shall use the room, which is 18 x 22 feet with a 10½-foot ceiling, for a workshop, which will have a work bench extending all across the back end, which has a Western exposure. The proprietor wants to heat the shop from the coal stove, and thinks that a pipe can be run from a coil in the stove above the smoke pipe; then through the floor and up to the ceiling of the shop, so as to avoid a door which is in the shop. In returning to the stove it will connect with a pipe coil, as he does not wish to use a radiator, but he does not know what size pipe or how much of it to use. I have my doubts about it keeping the room warm, as it is in the west end of the building and the work benches have to be at the west end on an outside wall. The building is of brick and a stove pipe runs up to a chimney which stops at the ceiling of the shop.

Answer.—If the stove in question has sufficient heating capacity to heat the store in which it is and the water that would be necessary to heat the shop, it seems as if there would be no difficulty in piping the job so as to give good results. Using the cubic rule in determining the amount of heating surface that would be required in the room, we find that about 140 square feet of radiating surface would be required. This is allowing 1 square foot of radiating surface to every 30 cubic feet of space. Owing to the large size of the radiator, it is probable that 1¼-inch would be better in this case than 1-inch pipe, and in order to expose 138 square feet of surface 322 lineal feet of 1¼ inch pipe would be necessary. The placing of this pipe might be either in a return bend coil or in a manifold coil, and in order to get this amount of pipe in a room it is probable that it would be necessary to have the coil extend across one end of the room and a few feet along each side. It is quite a common practice to place the radiating coil under the work bench, and no objection is made to it by the workmen. A heating coil placed in the stove has a superior heating surface and will take care of more square feet of radiation than is generally rated for a regular hot water heating apparatus, provided that the fire chamber is of ample size and a good fire is carried. Calculating on such conditions, 1 square foot of surface would be required in the heating coil in the stove for every 30 feet of radiation in the pipe coil in the shop, or about 5 square feet of surface. This would amount to about 11⅓ lineal feet of 1¼-inch pipe in the coil in the stove. This coil is preferably located just above the fire, so that it has the radiant heat of the fire and also the heat of the products of combustion. In piping the job the flow pipe from the coil in the stove should run with a positive ascent, so as to avoid air traps, to a point near the ceiling of the shop. Here should be placed an expansion tank, and when connected with the flow main at the highest point it will also serve as an air vent. The pipe from the flow main to the expansion tank need not be over ½ inch in size. From this point the flow main should drop to the radiating coil. In placing the radiating coil care should be taken to so grade it that any air that may be in it may escape up to the expansion tank. The return from the radiating coil may be run back to the stove and connected to the heating coil in the most convenient manner, but always preserving a fall to the stove. Water in being heated expands one-twenty-third of its bulk, demanding more space, and in order to prevent the expansion tank overflowing it should be of ample size.

Combination Heating.—III.

BY J. W. HUGHES.

The question of furnace and the best form of coil or heater adapted to it being decided, the fitter has next to consider the general plan or layout for the mains and branches to suit the different coils and radiators. As the buildings to be warmed differ in plan, so will the placing of the different pipes vary, and as long as the general principles controlling the circulation of water under the effects of heat are not violated the apparatus will work. But there is no doubt but that certain plans on a given job will work better than others. The main object to be kept in view is to so arrange the pipes as to allow of the greatest freedom of circulation. To this end undue friction must be avoided



Combination Heating.—Fig. 11.—*Piping of a Successful Job.*

by not having the pipes too small, and by avoiding too many and too sharp turns, and above all, the pipes must be so arranged as to allow of their being easily filled "solid"—that is, that there be no air pockets, a bubble of air in the mains or coils acting the same as a cut in a rope.

I have for a long time looked upon the circulation of water in pipes as being similar in principle to the pulling on a rope. There is no, or very little, push possible; it is nearly all pull, the pulling force being the difference in weight of the two columns. The weight in the return being greater than that in the flow pipe, on account of the expansion of water through the application of heat in the flow pipe or column, and the consequent greater density, or weight, in the return, causes the water in the return to fall or gravitate toward the point where the disturbance of the equilibrium is taking place—viz., in the heater. As the water in the heater becomes hot it expands and becomes lighter than the unheated water, and by the agency of the law of gravitation ascends to the top by the rising main or flow pipe, the colder (denser, not heavier) water flowing in by the return. As long as the motive power (heat) is applied this goes on continuously; but as the difference in the weight of the two columns of water—viz., that in the flow and return mains—is very little, it takes very little to stop it. It can be compared to a rope over a wheel. As long as the rope is intact and power is applied to pull it the rope continues to revolve as a whole; but cut the rope, or, in other words, break the continuity, and the motion is lost. You may pull part of it or push part of it, but the steady, even motion (circulation) is gone. A bubble of air in the pipes separates the water, and acts in the same manner as cutting the rope. In part of the system circulation may be maintained, being the same as working part of the severed rope, or the heat imparted to the coil may cause motion, but that is due to another powerful agency, steam, and it is no longer a quiet, continuous hot water circulation. Neither is it a regular working steam system, the presence of water in the return pipes preventing them working as proper steam returns. In making the foregoing statements I am aware that in some respects I differ from scientific writers on the subject of hot water circulation, but from a practical point of view it seems to act as described. Perhaps, scientifically, it should not; practically, to all appearances, it does. The lesson to be learned from this is to avoid everything that will prevent the pipes and coils from being solidly filled with water, and that will prevent the water from flowing freely in the direction in which it should go—that is, up from the heater when warmed, and back and down to it when cooled, or deprived of the heat that has been imparted to the air of the apartment to be heated.

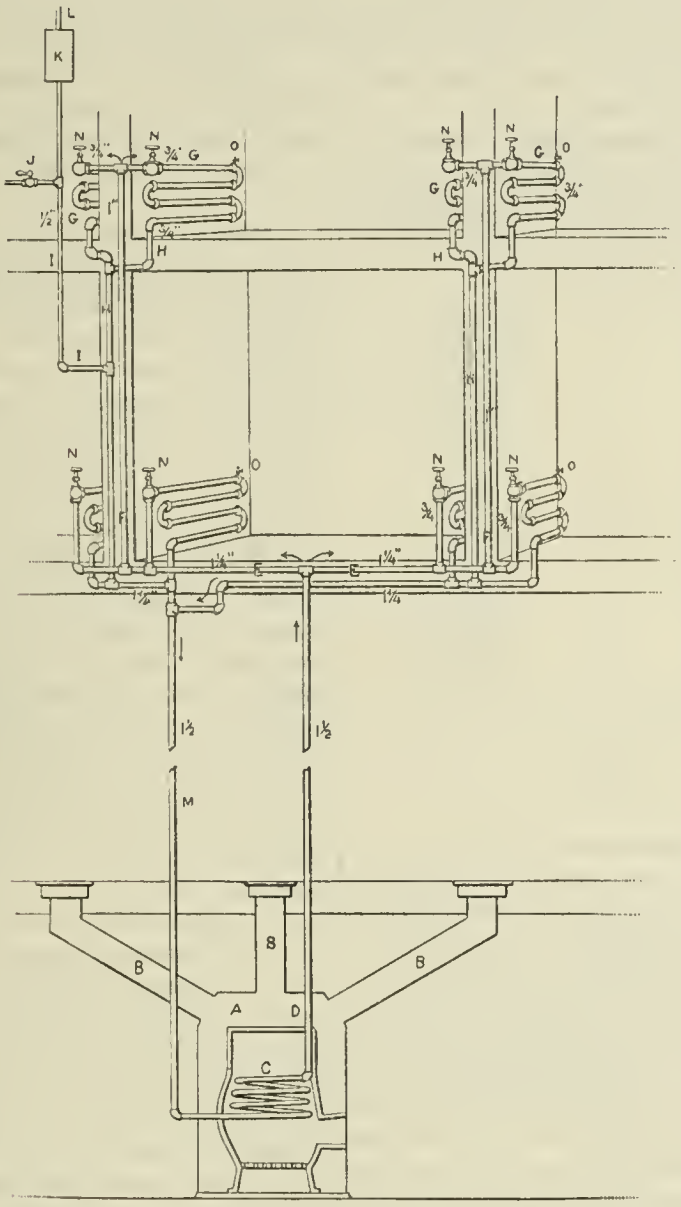


Fig. 12.—Pipes Arranged as in a Straight Hot Water Job.

In fitting the ordinary hot water apparatus it is possible to vary the sizes of the mains, both flow and return, and so proportion them to their work. The combination system is of necessity restricted in a greater or less degree by the size and make of the hot air furnace, and the possibility of fitting a given sized coil or heater in it. The fact must not be lost sight of that in a building warmed with a combination apparatus, air from the furnace is the principal factor, the heat from the hot water circulation combined with it being a useful adjunct or assistant for warming certain portions of the building to which the hot air cannot gain access, or to increase the heat where the hot air would only be partially sufficient. For this reason the apparatus must, as far as possible, be designed to work as a harmonious whole, and valves on the coils should be avoided. If the house becomes too warm, the heat can easily be controlled by the agency of the different keys and check drafts with which all good furnaces are equipped. But to shut off a coil on a general circulation makes an immediate and serious disturbance that is apt to throw the circulation out of gear and cause the formation of steam, with the accompanying noise. And when the checking of the fire causes the condensation of the steam the pipes will no longer be solidly filled with water, and, as a result, there will be a poor circulation or none at all, and the whole work of exhausting the air will have to be gone over again.

The following proportions of heaters or coils in furnaces to the amount of heating coils or circulation in rooms are from actual jobs that worked well, and form part of a record kept in the effort to establish a proper ratio between the heating coil and the work it would do in a satisfactory manner. While no actual rule covering the whole question was ever made as a result of the record kept, yet the fact was established that there were limits above or below which it was not safe to go. Difference in strength of chimney draft, kind of fuel, construction of building, &c., were all important factors, constantly varying, that prevented anything like mathematical exactness in laying down a rule. There is one rule that is positive, and that is to provide for a perfectly free circulation. This will neutralize in nearly every case defects in proportioning the size of heater to coils, and while it will not make up for a shortage of heating surface intended to warm a given area, it will even help out wonderfully on that point:

Thirty feet of 1¼ inch spiral coil in dome of furnace with 1¼ inch flow and return and 1 inch and ¾ inch branches heated 1300 feet of 1 inch circulation coils; 11 feet 1¼ inch heater pipe did the same for 380 feet of ¾-inch coils; 11 feet 1¼ inch coil with 1¼-inch flow and return and 1 inch branches took care of 260 feet of 1 inch circulation coils; 9 feet 6 inches of 1¼ inch heater coil with 1¼ inch flow and return mains and 1-inch branches to coils carried 240 feet of 1-inch circulation; 13 feet 7 inches of 1-inch coil with 1-inch flow and return branched off to 1-inch and ¾ inch supplied 550 feet of 1 inch coils; 12 feet 7 inches of same sizes to 325 feet was a success again; 12 feet of 1-inch to 320 feet of coils worked well; 11 feet 10 inches of 1-inch with same sizes for distribution carried 439 feet of coils; 14 feet 6 inches of 1 inch to 400 feet same sizes, and 13 feet 2 inches of 1¼ inch with 1¼ inch flow and return, 1-inch and ¾ inch distributing branches, to 490 feet of 1-inch coils gave good results.

Fig. 11 shows a method of piping that worked very successfully. A, hot air furnace; B B B, hot air pipes; C, heater coils; D, 1¼-inch flow pipe divided by a

Y-pipe into two 1-inch flows, E E; F F, stop valves on flows E and E, not to shut off but to control and separate flow through the 1-inch flows E and E in case the water had a tendency to circulate more to one side than the other. These valves when once set were seldom afterward touched. G G, branches to top coils H H, through circulation coils H H and H^2 H^2, in the direction of the arrows, made the coils as far as circulation was concerned practically one; I I, 1-inch returns branched into main 1¼-inch return J to furnace; K, ½ inch expansion pipe to tank L; M, open overflow pipe; N, water feed cock; O O O O, air cocks.

Fig. 12 shows another arrangement permitting of valves being fitted on the coils, and the piping more nearly approaches the methods used in a straight hot water job than Fig. 11. It shows furnace A with hot air pipes B, heater coil C, 1½ inch rising main or flow D, which is branched at first floor into two 1¼-inch pipes, E and E, from which are taken ¾ inch branches to supply the coil on first floor. These mains E E are again branched from for the 1-inch risers F F, which are carried up in partition to supply coils on top floor, where they are branched ¾ inch for the coil supplies, returning through the pipes H into the main return M. N shows the valves on the different coils; O, the air cocks; I, the ½-inch expansion pipe; J, feed cock supplied from some adjacent water pipe; K, tank; L, overflow. The method of dividing the flow and bringing back the return is clearly shown, the arrows giving the direction of movement of the water. The coils generally used were circulation coils, as shown, and were secured to the wall by straps and back plates, the coils being made with close straight bends—that is, without pitch—the object being to make them more compact. They were generally fitted above the baseboard, and sometimes box coils were used similar in construction to the ordinary box coil made for steam heating.

Loss of Heat and Radiation.

From H. T. G.—Please answer the following questions in *The Metal Worker*:

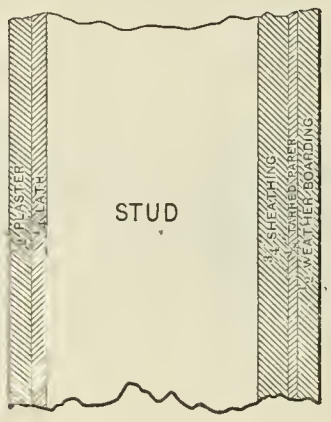
1. What number of heat units are lost per square foot per hour for a difference of one degree between the external and internal air by the external wall, a section of which is shown in the accompanying sketch?

2. What number of heat units are emitted per square foot per hour by both direct and indirect radiators with the water and steam in the radiators at the following temperatures: 120, 140, 150, 160, 170, 180, 190, 200, 210, for water and 220, 230, 240, 250, 260, 270, 280, 290, 300 degrees for steam?

3. Would the same amount of heating surface be required to raise the temperature in a room on the third floor of a building to 70°, external air zero, as in the same size room and under exactly the same conditions on the ground floor, all the building being heated?

Answer.—On pages 38 and 39 of *The Metal Worker* for October 1, 1892, Leicester Allen gave a rule for determining the transmission of heat through walls of buildings, and among examples illustrating the use and value of the rule he cites a case of a wall which may be considered, for all practical purposes, the same as that shown in our correspondent's sketch, and illustrates it in Fig. 2 on page 38 of the issue named, which cut is reproduced herewith. He finds that the loss of heat through such a wall per hour for 1° of difference between inner and outer temperatures is the same for a surface of 2.6381 square feet as it would be through a square foot of glass under like conditions. The loss for a square foot of glass for a difference of 1° being 0.53 heat unit per hour, we find the loss through a square foot of the wall by dividing 0.53 by 2.6381, and the answer is 0.2009 of one heat unit. If the outside temperature were —10° F., and inside 70°, the total loss per square foot per hour would be 0.2009 multiplied by 80, or 16.072 heat units. This in a case where the outer surface radiates freely into space.

2. If the numbers given below for the amount of heat imparted from direct radiators at the temperatures named be divided by two the results will be



Some Questions in Heating.—Section of Wall.

practically near enough for indirect surface as ordinarily used, or where the air to be heated is not driven through them by the use of blowers. It must also be premised that there is a great difference in direct radiators in their power to impart heat. A radiator with three rows of loops or vertical tubes will not impart as much as one with two rows, and the latter will give out less than one having only a single row. There are also differences in heating capacity due to form of loops, and extended surface gives out less per square foot than plane surface. It is obviously too much of an undertaking to give figures at the different temperatures named by our correspondent for every variety of radiators in the market, and, besides, the experimental data for doing this are not obtainable. There are a great many radiators in the market that have not been accurately tested. Some sort of surface must therefore be assumed, and we will therefore figure for what is about the average for direct radiators with two rows of loops or tubes, 36 inches high, for surface, as rated by their manufacturers. Our correspondent gives the temperatures of the radiators, but does not give the temperature to be maintained in the rooms, but we suppose that this is to be 70°. This being the case, the average direct radiator of the kind above named, when set with average skill, will, at 120°, give out about 90 heat units per hour for each square foot of rated surface; at 140°, 126 heat units; at 150°, 144 heat units; at 160°, 162 heat units; at 170°, 180 heat units; at 180°, 198 heat units; at 190°, 216 heat units; at 200°, 234 heat units; at 210°, 252 heat units; at 220°, 270 heat units; at 230°, 288 heat units; at 240°, 320 heat units; at 250°, 340 heat units; at 260°, 364 heat units; at 270°, 384 heat units; at 280°. 406 heat units; at 290°, 424 heat units, and at 300°, 440 heat units. As already said, these figures should be divided by two to get the amount imparted by indirect radiating surface in average practice. The figures are given from records of experiments, not with plain pipe surface, but with direct radiators in actual use.

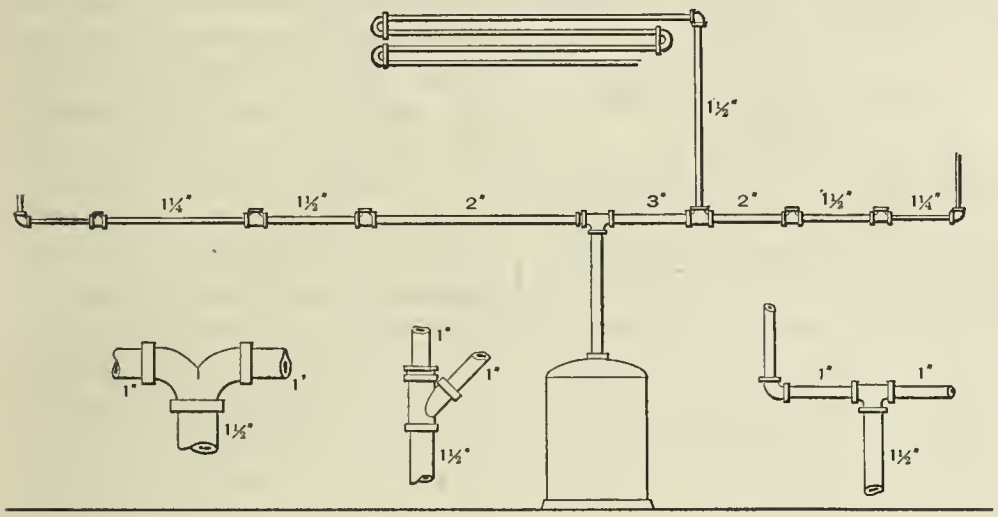
3. There is quite a diversity in practice as to reduction of radiating surface for rooms of the same size on second, third, fourth and fifth floors. In some cases these rooms feel the effect of heat from rooms below more than in others. In cheaply built buildings, such as are most of our city flats, when all parts are heated the air warmed below rises through halls and floors more than in well constructed buildings with fewer stories; and in well built houses, where a large hall is kept constantly heated, the upper rooms will generally not require as much radiator surface as do heated rooms of the same size situated directly below them. In this, as with many other points in heating buildings, no hard and fast rule can be laid down, and the fitter must be guided by judgment and experience. It is quite common to allow a reduction of one-tenth for each successive upper floor if the rooms are large. Thus, if a square room on first floor requires 80 square feet, the next above, if of the same size, would need 72; the third floor, 64; the fourth, 56, and the fifth, 48 square feet; and in many cases this arrangement would work well, but in most cases, in well built buildings, a reduction of only 5 per cent. would be safer, especially where the superimposed rooms are so small that the one on the lower floor would require not more than 40 square feet.

THE CONTRACT for ventilating the new Reichstag buildings at Berlin, Germany, was intrusted to Daniel Grove, an English engineer, whose plans received the first prize in open competition. The amount of fresh air required is estimated at 200,000 cubic meters per hour. This estimate provides for a thorough change of air in the parliament chamber five times every hour during the sittings, and in the other parts of the house at such frequent intervals as is likely to be requisite. A uniform temperature of 68° F. will be maintained throughout the building, partly by hot air and partly by hot water pipes. Mr. Grove has also charge of the kitchen and sanitary arrangements, which are all of the most modern and improved type.

A Pipe Fitting Question.

From C. E., *Worcester, N. Y.*—I should like to have some information as to whether or not it would be practicable to take two pipes from one opening on a main in a hot water job. I give a sketch of the flow pipe, and wish to take a 1¼-inch connection from the main at the point where it is reduced from 3 inches to 2 inches as marked, using a 3 x 2 x 1¼ inch T at this point. I intend to use a 1¼-inch nipple running into a T, which is to be bull headed, a 1-inch pipe running from each side. I intend to take a branch from one side of the T and lead it over to a coil, and from the other side I intend to run the pipe to a radiator. The question is, will such a method of taking off the branches secure good circulation?

Note.—We shall be glad to have some of our practical readers give us their opinions on this subject. The length of the mains leading from each side of a T so placed, the size of the radiators to be fed and the friction due to the method of piping all tend to secure a better circulation from one side than from the other. If, instead of using a T, a twin ell, as shown in the engraving, is used for this purpose, less trouble is likely to result. A still better plan would be to use a Y for the two 1-inch outlets. This would divide the volume and insure a better circulation through both the coil and the regulator.



A Pipe Fitting Question.

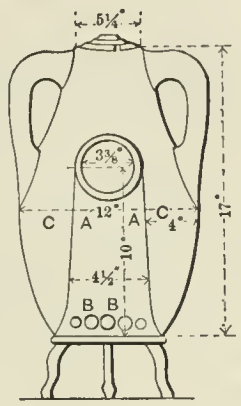
A Heating Problem.

From SAMUEL HEINS, *Rondout, N. Y.*—I notice in *The Metal Worker* of December 29 the article of "T. F. C.," with a diagram in which he asks the reason why one line of pipe works satisfactorily, while the other is a failure. It is pretty hard for any one to answer the question, because it is not stated whether steam or hot water is used. From the sketch it looks as if both of the flow pipes come direct from the top of the boiler, and it seems as if the pipe was complicated, so that there is little chance for a reader to discover just where the trouble is. A different character of drawing would have made the pipe plan more readily understood. There are several questions which if answered would render the solution more easy. The distance of the radiators from the boiler; whether the flow pipe runs straight up, and what character of radiator is used. When information is wanted the inquirer should be very particular to give the fullest possible details and make a careful drawing. From the sketch it would seem that the pipe has not been run properly. All straight fittings, such as bullhead tees and elbows, should be avoided. I have never seen a job work properly with such fittings. The character of the boiler and its distance from the center of the building and the exposure of the building are also important. The mains mentioned look large enough to supply from 200 to 500 feet of radiation. A 1¼ inch pipe will supply 125 square feet of steam radiation. The minimum size of main and return pipe for hot water heating is as follows: A 2 inch pipe will supply from 175 to 300 square feet of direct radiation, while a 1¼-inch pipe will supply 100 square feet of direct radiation. This shows that the flow mains are plenty large enough to do the work. There are a great many men who undertake to do steam and hot water heating who have very little experience, and when they get in a tight place with a job that does not work they ask for help. I have worked on a number of jobs this year that had to be overhauled by an expert to make them give satisfaction. In the past four years I have answered a great many questions and am of the opinion that inexperienced men would save money if they would study out the result that would follow their work before installing it.

A Pompeilan Boiler.

Frederick J. Smith, writing from Naples to *Engineering*, describes the boiler here illustrated:

The water tube boiler in which the fire is applied externally is sometimes spoken of as a modern invention, and the internal fire box is considered by some to belong to the time of Watt. The boiler I am about to describe shows us that the principle of internal firing was known about 2000 years ago. Among other objects found at Pompeii was a boiler of sheet metal, probably copper, as shown below. Its form is similar externally to several vases of silver found at Pompeii, but internally it is furnished with a cylindrical fire box, A A, surrounded by a water space, C C. The fire box is curved at its upper end and terminated in the side of the vase. The lower end of the fire box is furnished with five fire bars, B, B; each bar consists of a tube in communication with the water space. The internal diameter of each tube is about ¾ inch. The fuel used appears to have been charcoal, as fragments of it are to be seen in other heating vessels found at Pompeii. The joints are of excellent construction, and show, as do also many well made surgical instruments, the high culture and skill of the mechanic of the first century. The boiler is furnished with a closely fitting lid, and the whole is supported on three legs of beautiful bronze figures. I have been led to write this description of this curious tubular boiler of Pompeii, as I believe that the great antiquity of the internal method of firing is not generally known.



A Pompeiian Boiler.

Fire Caused by Radiator.

In a letter to *Fire and Water*, Philippe Douval, chief engineer of the fire department of Quebec, says: "Some few years ago a fire occurred in the Post Office Building in this city, and after investigating the matter very carefully, I came to the conclusion, and gave it as my opinion, that the fire was caused by a lot of canvas mail bags having been carelessly placed on a hot water heating pipe. This opinion was at the time questioned by some persons. Last week a fire developed itself in a house on St. Valier street, and it was found to have been caused by a hot water pipe which passed through the wooden ceiling and a deafening of sawdust. This incident will, I think, go far to establish the opinion I had at the time of the post office fire.

I have much pleasure in inclosing you a letter just received by me from Charles Barllarge, the civil engineer of this city, bearing on this subject.

Mr. Barllarge says as to dangers by fire from steam or hot water pipes, I have to remind you that it is only a few years ago, a fact of which I believe I informed you at the time, that, while I occupied house 54 St. Louis street, now tenanted by Dr. Beaupre, some light cotton children's underclothing laid on the radiators to dry in one of the upper stories was brought to me in astonishment by my wife, and found to be scorched absolutely, as if by an overheated smoothing iron. This was during soft weather, and therefore no cold, nothing to rob the heaters of their superabundant heat, due to a very hot fire at the time. This is a result which most persons are apt to doubt, and even disbelieve; the idea being that the heat of boiling water or ordinary steam—that is, steam produced under ordinary atmospheric pressure—can produce no such effect; and in truth such a temperature cannot do so, though in course of time even this will dry some woods to an extent to almost char them and reduce to the state of lignite, making them porous and of looser grain or fiber, and ready to take fire from the merest spark which under other circumstances would die out ere it had time to produce any

effect. But the fact is that just as at an elevation above sea level, you cannot, owing to the decreased pressure of the atmosphere, get a cup of hot tea unless boiled in a close vessel, in the same way in these hot water plants, the temperature goes far beyond the supposed 212° F., due to the water being confined and under a pressure of more than 14½ pounds to the inch. In fact, in an ordinary one story house and attics with heater in the basement, and where the hight to cistern or reservoir level may be 30 feet, the pressure will be two atmospheres, or 29 pounds, and the corresponding temperature of the water 256°, instead of only 212°. But in a three to four or five story house with attices, and heater in basement, the pressure on the water in the boiler will reach three atmospheres, and even four or more for greater altitudes, and temperatures increase to 274°, 292° and so on. Again, the overflow cistern or pipe leading to it will sometimes get out of order or choked or impeded in such a way that, though the hight may not be greater the pressure may be enhanced to almost any extent, and the temperature rise to 500° or more and become capable of quickly charring the softer and resinous woods, thus robbing them of their oxygen, when on cooling again they take in oxygen so quick as to produce combustion or take fire.

HEATING NOTES.

JOHN MCLEAN, formerly with the American Radiator Company, will travel in the Eastern States it the interest of W. A. Russell, manager of the New York house of the Detroit Lubricator Company, Detroit, Mich. Quick opening steam valves, hot water valves and a line of steam specialties will make his visits of interest to the trade.

OFFICIAL BULLETIN No 6 from the Master Steam and Hot Water Fitters' Association of the United States, issued from their headquarters in the Cable Building, New York, gives information on Association matters, and notes an increase in membership and an improved financial condition.

THE IDEAL BOILER COMPANY, 36 Dearborn street, Chicago, announce that they are now prepared to fill orders for all sizes of steam boilers. Quite a number of these boilers have been put in during the past fall and bear so well the test imposed upon them during the severe weather that has been experienced in the last few weeks that they push emphatically the claim that the Ideal steam boilers have no superior in the market.

THE COLORADO HEAT & FUEL SAVING COMPANY have filed articles of incorporation with the county clerk at Colorado Springs, Colo. The company is capitalized at $10,000 and the incorporators are H. J. Foote, J. F. Terrence, W. B. Boardman and F. E. Van Duzen.

JOHN W. MILLS, 100 Lake street, Chicago, has resigned the second vice-presidency of the United States Heater Company, and will again enter the field as a steam and hot water contractor. A new company will be formed, which will be known as the John W. Mills Company, and will consist of John W. Mills, also J. R. Mills and Frederic Dillzer of the Chicago Heating Company, 40 North Clark street.

C. V. KELLOGG, treasurer and general manager of the American Boiler Company, 84 Lake street, Chicago, has returned from an important business trip to Cincinnati and St. Louis.

THE ILLINOIS HEATING COMPANY, 88 Lake street, Chicago, have sold their right in the Cambridge self-cleaning boiler, which was patented by C. B. Thompson, to the J. H. McLain Company, Canton, Ohio, who will manufacture the boiler, both for steam and hot water.

THE NIAGARA RADIATOR COMPANY of Buffalo, N. Y., recently received orders from Switzerland for radiators.

THE FOWLER RADIATOR & MFG. COMPANY have removed their main office from Philadelphia to their works at Norristown, Pa., the change having been made on February 1. The company have elected a new Board of Managers for the years 1895–1896, as follows: President, A. H. Fowler; vice-president, J. R. Goehring; treasurer, John S. Waters; W. Barnhurst and S. B. Waters. The secretary of the company is C. R. Fowler, son of the president. We understand that business with the Fowler Radiator & Mfg. Company is good for this time of the year, they having some excellent orders. They particularly refer to the trade in their semi-direct radiators.

Manufacturers' Prudential Expenses.

A growing item of expense to manufacturers, says *The Iron Age*, is the apparent necessity of making special contributions to their customers or to interests allied with them. For instance, nearly every trade now has its State and national organizations, holding annual conventions. These conventions almost invariably carry with them some character of entertainment to be provided by the local members, who seek the assistance of manufacturers in bearing the expense. If local manufacturers are not sufficiently numerous or financially capable, no hesitation is felt in appealing to others some distance away. Manufacturers making a varied line of products are liable to be called on for contributions to the expenses of annual conventions in a number of trades. But the expenses do not always end with contributions of this character. In some trades the delegates do not hesitate to ask manufacturers to pay their personal expenses in attending conventions, because the local association is too poor to bear such a burden, but, nevertheless, desires to be represented. Again, a railroad company will resolve upon some character of publication to advertise the road. It may be an illustrated work, descriptive of the beauties of the scenery or setting forth the magnificence of the company's equipment, or it may be a guide book, but, nevertheless, the expense of publication is expected to be saddled largely, if not wholly, on manufacturers of railroad supplies, whose cards are inserted in the form of advertisements. The name of a railroad company has been known to be used in assisting schemes for the publication of huge posters advertising the company, but with the cards of contributing manufactuers occupying a portion of the space to preserve the appearance of rendering a return for the money contributed. It is not strange that members of railroad labor organizations should follow the example thus set and appeal to the same manufacturers to purchase ball tickets or otherwise contribute to the support of railroad unions.

Another heavy item of expense is incurred in connection with catalogues issued by wholesale houses. These catalogues are often exceedingly creditable publications, being printed and bound in the best style of the bookmaker's art. They are profusely illustrated, and generally contain numerous cuts of the specialties of manufacturers in the several lines covered. As large editions of such catalogues are distributed, it is claimed by their compilers that the manufacturers derive great benefit from the illustrations of their goods, and this benefit is capable of being measured in dollars and cents. The contributions received from manufacturers for the service thus rendered are usually sufficient to cover the cost of printing a catalogue, and in some cases it is asserted that a handsome profit has been realized. Some wholesalers have been known to go even further than this, and to authorize enterprising bookmakers to get up books of a popular character for free distribution by the house, the cost of publication being defrayed by the insertion of cards from manufacturers, solicited for the purpose.

These and similar expenses are usually charged by manufacturers to "Advertising Expense." The result is that the advertising account is often swollen to heavy proportions. When balances are struck at the end of the year, and it is deemed advisable, especially in such times as these, to retrench expenses, the large advertising account attracts anxious attention. The fiat goes forth that it must be cut down the coming year. On looking into the matter, the first channel of expenditure in advertising which is thought of is probably and very likely to be the trade paper. Disbursements on that account are ordered curtailed, and a great stroke of economy is thought to be accomplished when trade paper advertising is seriously cut down. Again there are numbers of manufacturers who recognize the value of trade papers as advertising media but who assert as a reason for not patronizing their columns that they are under such heavy expense for other forms of advertising that they cannot do so. Now we submit that it is not good policy to discard facilities for advertising which are acknowledged to be of the best character and carry with them no other consideration whatever than that of reaching the class of people sought. Those items of expense which are not for pure advertising should be placed in a separate account. Inasmuch as such expenses are incurred for prudential reasons, either to retain or secure some or all the trade of the parties to whom the payments are made, they should be charged to "Prudential Expense" or some other distinguishing title, separate and distinct from advertising. We do not impugn the motives of any person, nor do we attack the practice which has grown up in the several trades. Manufacturers have a right to expend their money wherever they think they will be benefited, and their customers have an equal right to secure whatever benefits they can from the commercial connection. But a distinction should be made between advertising for the sole purpose of reaching the largest possible number of people interested and expending money to influence the trade of one or at most a limited number of purchasers. Should such a distinction be made, we feel sure that the comparatively small amount paid out for actual advertising would be properly appreciated.

TIN PLATES.

The Tin Plate Settlement.

In less than five months from now the compromise tin plate scale adopted at Pittsburgh last month will have expired. Predictions are freely made that unless the tin plate manufacturers are granted further reductions in wages when the scale again comes up for settlement another conflict will take place. It is admitted that with the present low prices of billets those concerns who roll their own black plates and have modern equipped plants can realize a fair profit in the manufacture of tin plate and pay the compromise scale recently adopted. It is somewhat doubtful, however, whether billets will always be obtainable at $15 and less, and it is claimed that if they advance $1 per ton profits in the manufacture of tin plate will be wiped out. There is also another point to consider. The already large production of tin plates in this country, together with the tonnage that will be turned out in the near future by the many plants now under erection, makes it reasonably certain that before a great while we will be able to supply the home demand and considerably more. In this event the ruinous competition that has so long prevailed in other branches of the iron industry will extend to tin plate and wages will necessarily suffer. A Western manufacturer who has a well equipped plant and who is now operating under the compromise scale, states that with the present selling price of tin plate his profit is but 8 cents a box. He further states that a slight decline in selling prices or a moderate advance in billets will wipe out this small margin altogether.

When the situation has been carefully considered from all points of view, it would seem that wages in tin plate mills can be held at the present standard only for a time and must give way to some extent when the conditions now confronting the industry have arrived.

SCRAP.

The Monongahela Tin Plate Company, Pittsburgh, Pa., started some of their mills on Monday. The present equipment of the works, which are located in the Oliver Iron & Steel Company's old steel mill, is nine tin mills, employing about 500 skilled workmen. It is stated that the company are intending to add eight more mills, making 17 in all, which will make their plant one of the most important in the United States.

The Atlanta Steel & Tin Plate Company, Atlanta, Ind., are about to light their plant with electricity. The company at present use natural gas for lighting purposes, which costs them nothing, being obtained from their own territory; but they think the electric light is so much better as an illuminant that it will be economy to adopt it. They have also under consideration a proposition from a number of business people of Atlanta to contract for electric lights if the company will put in a plant of sufficient capacity to light a portion of the town.

As mentioned last week, the American Tin Plate Company, Elwood, Ind., started up with the four new mills which have been recently completed. This addition provides work for about 200 more men. They have at present nine tin mills in operation, with about 750 men, and are turning out about 7500 boxes of finished tin plates weekly. A tenth mill is in course of construction, which will be in operation in a few weeks' time.

The Cumberland Steel & Tin Plate Company, Cumberland, Md., have resumed operations, with a good volume of orders for black plates.

It is reported that the Blairsville Rolling Mill & Tin Plate Company, Blairsville, Pa., have made a proposition to the Amalgamated Association to pay the compromise scale rate, but without signing the scale.

We are advised by the Britton Rolling Mill Company, Cleveland. Ohio, that their black plate mills are in successful operation and that the new tinning house will be running by March 1.

The Licking Rolling Mill Company, Covington, Ky., are reported to have signed the tin plate scale of the Amalgamated Association.

The Lloyd - Booth Company, Youngstown, Ohio, have received an order for finishing machinery from the Beaver Tin Plate Company, New Lisbon, Ohio.

A proposal to raise the price of tin plates by a combination of the Welsh manufacturers, which was recently put forth by Mr. Daniel of the Cromfelin Works, seems to have fallen flat. It is generally recognized on the other side that, with the growing capacity for production of tin plates on this side of the water, any such policy would be suicidal.

The situation in the Welsh tin plate trade appears to be getting desperate. A London cable dispatch of the 6th inst. informs us that no less than 180 mills are idle, but that the Tin Platers' Union prefers complete stoppage to any further reduction in wages. The latest issue of the London *Iron and Steel Trades Journal* to hand reports the position of affairs in South Wales as serious. At present prices it is a matter of indifference to the makers whether they work or play. Orders are scarce and those received are not sufficiently attractive to induce the manufacturers to make special efforts to meet them. The prospects of the striking workmen are not, therefore, by any means bright for re employment in the near future.

The tin mills of the Ætna Standard Iron & Steel Company, Bridgeport, Ohio, which have been closed since October of last year, were put in operation this week on the compromise scale agreed upon between certain tin plate manufacturers and the Amalgamated Association. This firm decided last year to change four of their sheet mills to tin mills, but on account of labor complications the work was not pushed. Recently, however, good progress has been made toward fitting these mills for rolling black plates, and the firm expect to have them in operation early in March.

The Illinois Steel Company of Chicago emphatically deny the report, emanating from Pittsburgh, that they intend to build a large tin plate plant. The report stated that the company would erect a huge establishment, comprising no less than 30 black plate mills.

A member of one of the largest tin plate and metal houses in New York City, who is an acute and accurate observer, has just returned from an extended business tour, which embraced a number of the Western, Middle and Southern States, and has brought back with him the conviction that the country in general was never in a more favorable condition for a solid revival of business than it is at the present moment. Stocks are everywhere at the lowest possible ebb. Prices are at the bottom figure. There is much money waiting investment: and there is, moreover, a growing sentiment among consumers that the time is ripe to replenish their depleted stocks. Only one thing hinders, and that is the currency uncertainty. If the legislators at Washington would settle this matter, he is confident that an extraordinary impetus would be given to business in general and to the tin plate and metal trades in particular. As it is the general public is waiting from day to day to see what their representatives at the national capital are going to do to get the Treasury out of its hole, and until confidence is restored in this matter the wheels of the chariot of prosperity will still tarry. The individual above quoted describes the sentiment of business men throughout the country at the backing and filling methods of the law makers at Washington as one of exasperation.

Phelps, Dodge & Co., 11 Cliff street, New York City, announce that they have been appointed sole selling agents for the products of the New Castle Steel & Tin Plate Company, New Castle, Pa. The latter concern are about to largely increase their capacity for the production of tin and terne and black plates.

From the point of view of the workmen, president Garland of the Amalgamated Association expresses to the Pittsburgh *Dispatch* his satisfaction at the present situation in the American tin plate industry. Only three mills in the country, he says, are now running non-union, namely, the United States Tin Plate Company, Demmler, Pa.; the St. Louis Stamping Company, St. Louis, Mo., and Wallace, Banfield & Co., Irondale, Ohio.

The Southern canning industry begins to show signs of a revival of activity. Ten of the leading canning factories in Baltimore, which have been idle since October 1, started into operation again on Monday, and others are likely to follow suit.

PLUMBING and GAS FITTING.

Day Classes at the New York Trade School.

The class in plumbing at the New York Trade School this year is making rapid progress, some of the members having already passed on all of the work in the regular course. The superintendent, John Delehanty, has added some work to the course that was never required of the pupils until this year, which makes the progress all the more remarkable.

The lead burning class, which is made up of pupils from the plumbing class, contains over 50 members, the largest in the history of the school. This class has been divided into sections, and some sections have already received their final instructions and have examples of very fine work on exhibition. The instructor, T. B. Walmsley, has added a new method to the course this year, which is the use of a compound blow pipe with illuminating gas. This system is easily mastered after the regular system with a machine has been learned and is of wide practical use, as the plumber can always get gas, and with the blow pipe traps can be lengthened and waste pipes joined quickly and neatly.

The steam and hot water fitting class can show some fine pipe work, and under the instruction of Chas. Coolidge are rapidly becoming fitters whose work will bear critical inspection. An examination of their technical progress was recently held, and resulted satisfactorily to Thomas E. McNeill, who lectures on Tuesday and Friday of each week on a special set of questions which he has prepared. The practical and scientific instruction given in this course is calculated to make it one of the most valuable of the trades taught at the school.

Next year an effort will be made to secure a sufficient number to start the class in tin roofing, cornice and sheet metal work, and the course of instruction laid out for the class which failed to fill this year is being further perfected.

Willimantic Master Plumbers.

The master plumbers of Willimantic, Conn., have formed an association with the following members: William Vanderman, C. L. Clark, H. H. Lyman, Moriarty & Rafferty; J. J. Fay and Chamberlain's Plumbing Company. The objects of the association, in addition to becoming members of the State Association of Master Plumbers, will be a mutual effort to improve methods connected with the business. The organization will use its influence to have a plumbers' ordinance passed. There were present at the meeting James Ahern of Hartford, F. C. Weiant of New Britain and John S. Craig of Hartford. The local association elected the following officers:

President, William Vanderman.
Vice-President, Charles L. Clark.
Secretary, Frank P. Rafferty.
Treasurer, Hollis H. Lyman.

Chicago Master Plumbers.

The members of the Chicago Master Plumbers' Association and a goodly number of their friends from neighboring towns and cities spent a most enjoyable evening on the 30th ult. The occasion was the annual reception and ball of the association. It was held in the banquet hall of the Auditorium, and was a decided success in every way. The new president, P. M. Murphy, opened the exercises with a neat speech of welcome, in which pleasant sentiments were gracefully expressed, finishing his address by presenting Paul Redieske, the late president, with a handsome jewel as a token of the esteem in which he is held by his colleagues of the association. An appropriate response was made by Mr. Redieske. George Herbert then favored the assemblage with a song, after which ex-president Robert Griffith made an able address, taking the place of Health Commissioner Reynolds, who was unavoidably absent. The Latona Club, an orchestral organization, partly composed of plumbers, then rendered a fine selection, after which Scotch dances were given by Miss Maud Gordon, a piano and violin solo by Miss Lily and Master Mandable, children of M. L. Mandable, and a character song by W. W. Murray, who also read an original poem. Dancing then followed, the grand march being led by Mr. and Mrs. P. M. Murphy and Mr. and Mrs. M. L. Mandable. The arragements were of the most satisfactory character and nothing was overlooked that could contribute to the pleasure of those present.

A Live Wire and Plumbing.

In Philadelphia last week, according to newspaper report, a live wire from the trolley system broke and came in contact with an awning post and distributed the current in different directions. One current melted the lead service pipe to the building to which the awning post was attached and a flooded cellar resulted. The tin conductor on the next house was so melted at the joints that it fell on the pavement. The current then skipped past two houses, and a woman drawing water in the bathroom of the third was surprised to see a blue blaze issue from the pipes. She threw water on the flame and that, making a conductor, she received a severe shock, while the faucets were melted from the lead pipe. The employees of the trolley company were summoned and dammed the current while a plumber was employed to dam the flood. It is not known whether the morality of the damaged was sufficient to dam their wrath.

Municipal Cleansing and Public Health.

The February number of *The Engineering Magazine* contains a valuable article by Geo. E. Waring, Jr.. from which we quote the introductory portion:

It is not yet known exactly how the accumulation of filth in a town favors epidemics of disease, nor is it necessary to discuss this here; for, while there are numerous examples of long continued immunity from disease amid most filthy surroundings, there are records of a great many fatal outbreaks by which communities so situated have been suddenly devastated.

There is an almost unbroken record of the final disappearance of oft recurring epidemics and a steady improvement of the public health following the draining and cleansing of filthy towns and the supply of good water.

It is usual to measure the health of a community by the death rate. The true measure would be the health rate. There may be a vast amount of sickness, and of costly disability, with a very low death rate; but a high health rate is an unfailing index of good sanitary conditions, and it insures a low death rate as a matter of course. It is probably safe always to say that, while man may so far withstand the influence of filth as not to die from its effect, the public health—the vigor, efficiency, comfort and happiness of the people—is likely to be grievously lowered by it.

It is a fundamental principle of municipal economy that what leads to health leads to wealth. Yet there is no other self-evident proposition to which public sentiment is so indifferent. Nothing is easier than to awaken popular interest in a new city hall, a brick pavement, or a new fire engine house, and nothing is more difficult than to raise it to the paying point in favor of good drainage, clean streets and enforced sanitary regulations. It often requires the stimulus of a fatal epidemic—a sharp, quick and repeated stroke of death—to loosen the public purse-strings in the interest of the public health. Sometimes even this is of little avail, and we have to await the influence of a great popular panic of dread, as of cholera or yellow fever. The cholera scare of 1892, when one enthusiastic newspaper doctor said, "The cholera germ is actually thundering at the gates of New York," did more good to the crowded tenement house districts of that filth ridden city in a few weeks than had been accomplished during years of indifference. The first case of yellow fever at Brunswick in 1893 frightened its people to flight, and instituted a heartless "shot gun quarantine" throughout the whole region into which they fled. During the whole season there were fewer than 60 deaths, and most of these were believed by experts to have resulted from perennial "malarial fever," which is always very fatal along that coast. As a result, Brunswick is now being sewered in the most effective way, and sanitary

regulations are being enforced which, with the improved drainage, will save more lives every year than have been lost through yellow fever in any ten years, to say nothing of the reduction of sickness from minor malarial diseases, which have constantly sapped the vigor of the people.

The dread of yellow fever is not unnatural, for its devastations in Boston, New London, New Haven, New York, Philadelphia, and most of the larger Southern cities have been terrific. The improvement of health conditions seems now to have driven it into the southeastern corner of the country. Memphis was reclaimed after its very fatal epidemic of 1878-9. New Orleans was first fenced in by a quarantine which has at least coincided with immunity from yellow fever, and it is now being sewered.

It is safe to say that there are more deaths in the United States every year from distinctly "preventable" diseases, which are always with us, than have been caused by yellow fever and cholera together in all the 30 years since the war. Yet we take these deaths as a matter of course, and we pay no official regard to the 20 cases of disabling and painful illness that each death is estimated to represent.

Let us take, as a concrete example, the case of a town that has only 12 deaths from typhoid fever in a year. This disease can be entirely extinguished. Every death from it is an unnecessary death—as much so as a death from small-pox. The town in question therefore suffers, monthly, the private execution of one of its unoffending citizens, in expiation of a crime that may be partly its own and partly its neighbor's. The people accept this execution as calmly as they would accept a monthly death from old age. They go on electing the usual city officials and voting money liberally for pavements and new fire apparatus; but they leave the care of the public health to agencies that were considered adequate at a time when we still supposed that the question of life and death was in the hands of God and was to be determined largely by prayer. We now know that in this case, as in so many others, "*laborare est orare;*" but, while we may trust less to prayer than we formerly did, we are still slow in effective labor.

While great advances have been made in sanitary knowledge and practice in a few towns and among a limited class of the people, when we come to consider the 12,000,000 inhabitants of towns of more than 1000 and not more than 25,000 population, we find that, as a rule, sanitary improvement hardly exists. With the great majority of these towns the beginning of the sanitary impulse, beyond the occasional influence of a striking epidemic or the fear of an impending epidemic, has hardly yet been felt.

THE J. L. MOTT IRON WORKS, New York, are developing considerable trade in their gas furnace pot for melting metals. This has been found very convenient in printing establishments for melting their stereotype metal. It is made in three sizes capable of melting 250, 500 or 1000 pounds. The burner is arranged in the larger sizes in 11 sections, each section consuming from 15 to 25 feet of gas, as it is regulated. With six sections in operation and replenishing as the material melted, 1500 pounds of metal have been melted in three-quarters of an hour. Manufacturers who use large quantities of molten metal in their work will find this apparatus very convenient, particularly where it is not desired to run furnace continuously.

Connecticut State Plumbers.

The fifth annual convention of the Connecticut State Association of Master Plumbers was called to order at Waterbury, Conn., by President James Ahern, at 9.30 a.m. Wednesday, in a handsomely decorated hall. The president introduced Thomas D. Barlow of Waterbury, who made an address of welcome and introduced the Mayor of the city. The Mayor stated that he sympathized with the plumbers in the attempts at humor at their expense, and congratulated them on being always ready to afford prompt relief in times of need. He called attention to the new water supply of the city and extended the courtesy of the city during their stay. President Ahern returned the thanks of the association for the courtesies extended. The Credential Committee was then appointed, and a recess was taken until its report was made. The committee reported favorably on 12 new members.

After appointing the Auditing Committee the roll was called, and among those present were:

J. C. Howland.
James Ahern.
S. E. Dibble.
R. H. Stohart.
J. S. Craig.
A. J. Clerkin.
Wm. Vanderman.
F. A. Curtis.
Geo. Agard.
H. A. Despar, Worcester, Mass.
John Mitchell, President National Association Master Plumbers.
W. E. Crosby, National Executive Clerk.
A. Troland.
Major H. B. Middlebrook.
L. H. Mills.
Geo. E. Schofield.
Thomas Logan.
A. L. Brown.
C. H. Belfield.
C. S. Eames.
F. C. Booth.
J. M. Page.
D. L. Yarrington.
R. B. Chamberlain.
Edward A. Fuller.
James Donovan.
Geo. D. Buck.
F. J. Reynolds.
H. H. Goodale.
Thomas Oakes.
N. B. Bull.
E. B. Smith.
N. R. Bailley.
S. H. Beard.
H. A. Beaton.
Geo. Leckler.
J. D. Eldridge.
G. W. Hazel.
J. Monaher.
A. D. Sykes.
W. H. Marston.
Thomas Barlow.
Geo. W. Minor.
Robert Morgan.
D. A Curtis.
John Mulligan.
J. B. Weiant.
J Murray.
P. J. Tierney.

President Ahern then introduced John Mitchell, president of the National Association of Master Plumbers, who made an interesting address on the success and advantages of organization and the interests of the plumber, which was received with frequent applause. He spoke of the objection to the camp follower at the national convention, whose influence and behavior were discreditable, and stated that a welcome and a warm one would be tendered to the representative honorable business men who came to the convention to partake of its benefits.

A vote of thanks was tendered President Mitchell for honoring the Connecticut State Association by his presence. A letter was read from L. B. Cross regretting that he could not accept the invitation to attend. Letters were also read from John Trainor, Baltimore; D. G. Finnerty, Boston; W. E. Goodman, Milwaukee, and H. J. Pattison, New York, and an invitation was received from Randolph & Clowes to visit their works. The Executive Committee reported that several meetings had been held and the affairs of the association were in good condition, and that a bill had been framed and was now before the State Legislature.

The reports from the other committees were read and accepted.

S. E. Dibble read a paper on apprenticeship, which we print in full elsewhere.

H. A. Despar, Worcester, Mass., was introduced by the president, who stated that Mr. Despar had given excellent assistance to the Legislative Committee by furnishing them specimens of defective plumbing and traps to exhibit before the Legislature to aid in securing the passage of the bill now before it.

The report of the retiring officers was then read, in which the death of Alfred Hopkins was alluded to as a great loss to the association and the trade. Thanks were given to those who had assisted the officers in their work.

R. H. Stohart stated that as Alfred Hopkins had been one of the oldest, ablest and most enthusiastic plumbers, he moved that a committee be appointed to draft resolutions to be submitted to the association and after being passed to be sent to the family of the deceased.

The convention then went into executive session. After adjourning the executive session an election was held, when the following officers were selected for the ensuing year:

President, J. B. Weiant.
First vice-president, C. S. Eames.
Second vice-president, A. J. Clerkin.
Corresponding secretary, George Rapeleye.
Treasurer, John S. Craig.
Financial secretary, R. H. Stohart.
Delegates to national convention, J. B. Weiant, L H. Mills and William Vanderman.
Alternates, F. J. Reynolds and J. Donovan.

A vote of thanks was tendered the master plumbers of Waterbury for their

hospitality, and also to the retiring officers for their excellent service.

Middletown was selected as the place for holding the next convention.

The convention then adjourned to a banquet at the Scovill House. After disposing of an elaborate *menu* speeches were made by Mayor Kilduff, John Mitchell, president of the National Association of Master Plumbers, and J. B. Weiant. Not the least enjoyable feature was a quartet, singing "Love's Old Song" and "Maiden, Wilt Thou Dance?" James Ahern alluded to the Waterbury watch and the Brown boiler as spreading Waterbury's fame. P. J. Tierney of Rhode Island, M. J. Daly, H. A. Despar and Robert Morgan also spoke, after which the plumbers dispersed with pleasant recollections of the hospitality of the Waterbury plumbers and the value of association.

The Trade.

Peck Bros. & Co., New Haven, were represented by Irving B. Hotchkiss, A. J. Purdue and S. D. Baker.

Randolph & Clowes, Waterbury, by F. H. Hoffman, Frank J. Rourke and Thomas M. Hadley.

F. J. Knox, Hartford, by Dwight W. Knox and L. M. Dyer.

Henry McShane Mfg. Company, by R. H. Maguire.

The Momeyer & Story Company, New York, by N. D. Merwin.

E. S. Wheeler & Co., New Haven, by W. E. Morgan and E. W. Hotchkiss.

C. S. Mercer & Co., New Haven, by R. S. Woodruff.

Hopson & Chapin Mfg. Company, New London, by W. S. Hopson.

The Stamford Foundry Company, Stamford, by S. H. Plumb.

The Richmond Stove Company, by B. Mallory.

The New York Central Iron Works, by D. G. Richardson.

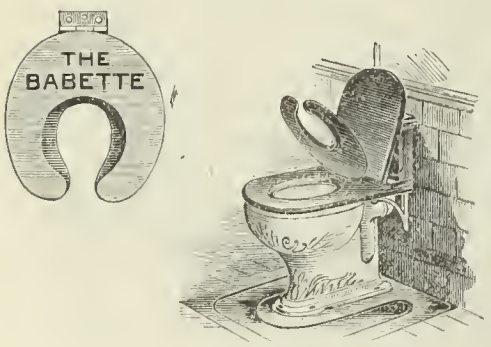
The Ideal Boiler Company, Boston, by Herbert E. Jones.

Randolph & Clowes, Waterbury, had a fine display of plumbers' goods in the convention hall.

The convention hall decorations were arranged by T. H. Bolger, State vice-president of the Journeymen Plumbers' Association.

Babette Seat.

The Babette Company, Disston Building, Philadelphia, are putting on the market the child's closet seat shown in



The Babette Seat.

the accompanying illustration. It is made of stamped steel, the hinge being of brass, riveted to the plate. Its construction allows of its being easily adjusted to any closet seat, and the fact that there is room for such an article in nearly every household should insure for it a good sale. It is heavily lacquered to represent oak, and is both strong and durable.

Apprenticeship.*

BY S. E. DIBBLE, NEW HAVEN, CONN.

I do not propose to give any history pertaining to this subject, but there are a few matters in connection with it to which I desire to refer. As you all know, this system formerly involved the binding out, by their parents, guardians, or other proper authority, by contract, minor children for a term of years, for the purpose of being instructed in the art or trade they professed. The old English law required a service of seven years to learn a trade, but in Connecticut no time was limited. The result was that in England a much longer time was required than was necessary in many cases, while in this country insufficient time and the lack of proper regulations have oftentimes opened the door to and subjected us to the inconvenience of unskilled mechanics. As a system apprenticeship has passed away, and there seems very little encouragement for its revival. When the master mechanic ceased to work with his apprentices, not only were the boys deprived of the personal care of their masters, but the workshop itself ceased to be a place in which trades could be thoroughly acquired, and the boys were too often kept at work which they can do to the best advantage of their masters, or even to the best advantage of themselves, without, however, learning their trade in all its various branches.

In my own experience, I am frequently requested by fathers to take their sons as apprentices and teach them the trade. Such requests are frequently accompanied with offers of payment, and when so accompanied I have always positively refused to entertain them, on the ground that a boy working without pay lacks a necessary element to ambition; for weekly pay, though small, stimulates him to do better work, and helps, I believe, to make him a better man. There should always be a thorough understanding with the parents of all boys being taught in this way, as well as with the boy himself, upon all the points which may enter into such an arrangement, such as time, services, pay, &c. I think that we do not sufficiently encourage our boys to learn our trades, whatever those trades may be, and this, in my judgment, is a great mistake.

If the master plumber is no longer able to give his apprentice his personal attention, and the benefit of a personal contact with him—his time being more profitably spent either in his office or in some place outside of the workshop—some other system than that which many of us knew in our younger days must be substituted. This substitute seems to be afforded in the trade schools, where trades are taught the youth of our land as the professions are taught in the professional schools. The modern trade school is not altogether an untried venture. The industrial schools of France are not new, and have contributed much to the wealth and prosperity of that people. England spends large amounts of money in establishing and maintaining similar schools, where young men can learn what the workshop does not teach, and what a thorough and successful application of the laws of sanitary science require. The practical man, be he a master mechanic or a journeyman, may say that it is not possible to teach in any school sufficient to equip a man for first-class work. This, to a considerable extent, is true, and is recognized in the professions. Experience in a lawyer's office, for a law student, or in a hospital, for a medical student, are essential accompaniments to the studying, which the schools afford, to make the most successful lawyer or doctor. And so it seems to me it may be in the trades. A boy in a trade school is not expected to completely prepare himself in all details, but it teaches him the laws on which a trade should be based, and by which it is, to a large extent, governed. This feature is, I think, oftentimes in danger of being forgotten, and it seems to me that in these days it is the combination of the trade school and the workshop that will produce the best results; the trade school to teach boys how to work, and the workshop to enable them to perfect, by experienee, what they first have learned.

This matter of regulating and governing our boys is an important one, more important than many of us think. It is the foundation on which the future success of our trade largely depends. This raises the inquiry, Are we doing what we can to make the plumber of the future a master plumber? Are we making him as competent and skillful as we ought to, so that when he comes before the world to care for the interests which will be his he will be able to successfully promote those interests to his own advantage and the advantage of those whom he serves? The workmen of the future should be better workmen than we are. This I say without any disrespect to any member of our association or to any plumber, be he master or journeyman, throughout the land, for it is only by improving each successive generation of workmen in any calling that the welfare of that calling can be promoted. I see no reason why our boys should not be educated, but every reason why they should be educated thoroughly. Suitable boys or young men should be selected in the first place, and then they should be carefully taught the trade in all its thoroughness and detail. Whether it is advantageous to return to the old system of indenture may be a doubtful question, but I think that no boy should be permitted to perform the duties which his trade may thrust upon him until he has served a term of years in the workshop—five, for example—beginning, perhaps, at the age of 16, with a rebate of from one to two years if he is a graduate of a trade school.

I would close by referring in this connection to the apprenticeship system now in vogue in Chicago. Under this system each employer returns to the Master Plumbers' Association a list of those working for him as apprentices, with the date when they began so to work, their ages and their places of residence. All this is recorded by some proper officer, who issues a card to the employer, to be kept so long as the apprentice works for him. When the apprentice ceases to work for him the employer makes an entry of that fact upon the card and returns the same to the association. The apprentice also receives a card from the association which passes as a voucher of his standing, and which, whenever he changes his boss, is properly filled in with the date of such change, &c., until his certificate shows that he has served the proper time. The result is that a complete record is kept of all apprentices, their fitness, residence and such other details as may be of use to employers. The period of time covered by the apprenticeship is five years.

* Read at the Waterbury meeting of the Connecticut State Association of Master Plumbers.

TRAPS AND VENTS.

IT IS REPORTED that on February 1 the Sanitary Potters' Association, which was formed in 1890, was formally dissolved by mutual consent, and the $500 posted as a forfeit by each of the 13 sanitary potteries interested was returned to the depositors. The association comprised the ten sanitary potteries in Trenton and one each in Bordentown, Baltimore and Tifflin.

AUDITOR-GENERAL GREGG, Philadelphia, will appeal from Judge Bregy's recent decision that Plumber John Gormley was exempt as a manufacturer and not a dealer. The question in dispute involves between 700 and 800 persons, and means a loss or gain to the city of between $10,000 and $12,000.

A REPORT to the Board of Health of Philadelphia finds many school buildings in an unsanitary condition.

J. M. BUTLER & SON are a new plumbing firm, in Suffolk, Va.

PLUMBER: "I want to see the tank, mum."

Lady of the Flat (snappishly): "Well, he ain't here; and what's more, I don't expect him before 2 or 3 in the morning."—*Exchange.*

THE L. J. TOWLE COMPANY, Boston, Mass., had a fire in their plumbing supply house last week.

SMITH & WOODHALL, plumbers and tinsmiths, Southbridge, Mass., have dissolved copartnership by mutual consent. Mr. Smith will continue the business.

PATRICK J. OWENS, a well-known plumber of Roxbury, Mass., died at his residence, 65 Palmer street, last Sunday night, after a long illness.

A RESOLUTION was adopted at the Sanitary Convention held at Harrisburg. Pa., last week, recommending the Legislature to pass a bill to offer a prize of $25,000 to the discoverer of the best method for the disposal of sewage by precipitation, filtration or otherwise in a solid mass so that it may be returned as fertilizer to the land.

THE KING MFG. COMPANY, West Troy, N. Y., have been incorporated by the Secretary of State to manufacture and sell the King waste water trap and other plumbing and hardware specialties. The capital is $15,000 and the directors are: Fayette B. Durant, John H. King of West Troy, and Howard A. Lansing of Menands.

A BILL to control and regulate plumbers and plumbing is to be introduced in the Legislature of Rhode Island.

MICHAEL DRISCOLL has associated with him ss a partner in the plumbing and hardware business at Cazenovia, N. Y., Floyd F. Marshall. The new firm will be known as Driscoll & Marshall, and dates back to the dissolution of the firm of Collins & Driscoll, December 15.

A MODERN PLUMBING LAW is before the legislature of Delaware.

THE PLUMBING FIRM of Beck & Keith, Winston, N. C., have been dissolved.

THE PARTNERSHIP heretofore existing between John D. Swinton, Samuel S. Van Etten, David L. Swinton and John D. Swinton, Jr., under the firm name of Swinton, Van Etten & Co., Portchester, N. Y., was dissolved on January 21. The business of general hardware, steam heating, plumbing and stove manufacture is to be continued by the firm of Swinton & Co., comprising John D. Swinton, David L. Swinton and John D. Swinton, Jr.

THE SHUSTER FOUNDRY COMPANY, South Pittsburg, Tenn., will, it is reported, double the capacity of their pipe foundry.

A SANITARY MEASURE which the plumbers throughout the country will approve has been adopted in Chicago. In a school in the thickly settled districts and among the poorer classes a complete bathroom has been fitted up, and the grimy urchins from the district are given a bath by a woman who has been specially hired for this laundry work. It is stated that as many as 30 of the dirty youngsters have been scrubbed in a day, and that beneficial results have attended the work. A proposition to extend the bathroom to other schools in the densely populated districts is now receiving favorable consideration at the hands of the Board of Education.

THE Massachusetts Association of Master Plumbers hold their annual meeting in Boston next Tuesday.

JAMES H. EUSTIS, representing the Walworth Mfg. Company, Boston, was one of the visitors at the Plumbers' Convention at Waterbury, Conn.

AT A RECENT MEETING of the Bridgeport, Conn., Master Plumbers' Association the following officers were elected for the ensuing year: President, Geo. E. Schofield; first vice-president, Msjor H. B. Middlebrook; second vice-president, Theodore Fox; treasurer, L. H. Mills; secretary, C. T. Eames; financial secretary, Thomas Logan.

GEO. H. CLOWES of Randolph & Clowes, Waterbury, Conn., is about combining business with pleasure in making an easy tour through the South and West in the interest of seamless drawn brass and copper tubing and sheet brass and copper.

THE AHRENS & OTT MFG. COMPANY, Louisville, Ky., have issued a circular in a three-color effect devoted to their enameled soil pipe and fittings, which are tested to 50 pounds water pressure. Attention is called to their smoothness, securing a perfect flushing, their non-absorbent and non-corrosive qualities, and to the claim that they can be used in an ordinary house with but a small advance in cost over tarred pipe.

F. B. WOODS, Everett, Mass., has lately purchased the plumbing stock and good will of Geo. W. Plaisted, and is about to open a shop on Chelsea street.

THE NEW BUILDING that is being erected by Disley & Weyand, at Waterbury, Conn., for their plumbing, sheet metal, cornice and skylight business is well advanced. It is to have a sheet metal front, which is already making a fine show. Progress on this building is being delayed by their press of work for their customers.

DR. JAMES CAMPBELL, P. J. Darcey, James Ahern and T. L Dowling, representing the Board of Health, the master plumbers and the journeymen of Hartford, Conn., held a session in the Board of Health rooms on Friday evening of last week, for the examination of journeyman plumbers, applicants for licenses as such. Seven men were examined, as follows: T. M. McCarty, M. J. Brazel, E. C. Kelleher, George Owens, John J. Carney, J. C. Keenan and D. O'Connell. The first five passed a successful examination and will be granted licenses. Keenan and O'Connell have yet to make a practical test to the satisfaction of the board.

PHILO STEWARD, who has officiated for a year or more as bookkeeper in the plumbing firm of N. S. & B. T. Steward, Skowhegan, Me, has purchased the interest of the junior member of the firm. B. T. Steward is soon to establish himself in the same business in Pittsfield, and Geo. Williams, also of Skowhegan, will be associated with him in his new field.

A BUFFALO PLUMBER was up before Mayor Jewett last week for violating the city ordinance in connecting the plumbing in a house without notifying the Water Department. He said one of his assistants neglected to notify the department and that he was out of the city at the time or the thing would not have happened. The Mayor has the power to revoke his license, but it is probable he will let the plumber off with a reprimand.

HENRY A. RATH, SR., a well-known master plumber, died a few days ago at his residence, in Elizabeth, N. J. Mr. Rath had recently visited Denver and also made trips to the South in the hope of restoring his health, but without success. He was born in New York 48 years ago, and when a boy enlisted as a drummer in the Eighty-eighth New York Volunteers and was severely wounded at the battle of Manassas. On coming to Elizabeth, Mr. Rath learned his trade as a plumber with John Hilton, before which time he had worked for the Richardson & Boynton Company. Later he entered in partnership with Charles Spittlehouse, with which connection he continued in business for seven years and afterward alone for 14 years. For the last two years the firm have been H. A. Rath & Co., his partner being Henry Kleinhaus. Mr. Rath was well known in Elizabeth and his death will be severely felt by many friends. Mr. Rath died on the twenty-fifth anniversary of his wedding and besides his widow leaves three sons and one daughter.

Chicago Master Plumbers.

The Master Plumbers' Association of Chicago gave its second annual banquet and ball last week at the Auditorium. About 500 persons were present.

Dr. A. R. Reynolds of the Health Department was on the programme for a toast, but was unable to be present. A pleasant feature of the evening was the presentation of a gold badge to the outgoing president, Paul Redieske, by Secretary Breen on behalf of the association.

Among those present were the following and their wives:

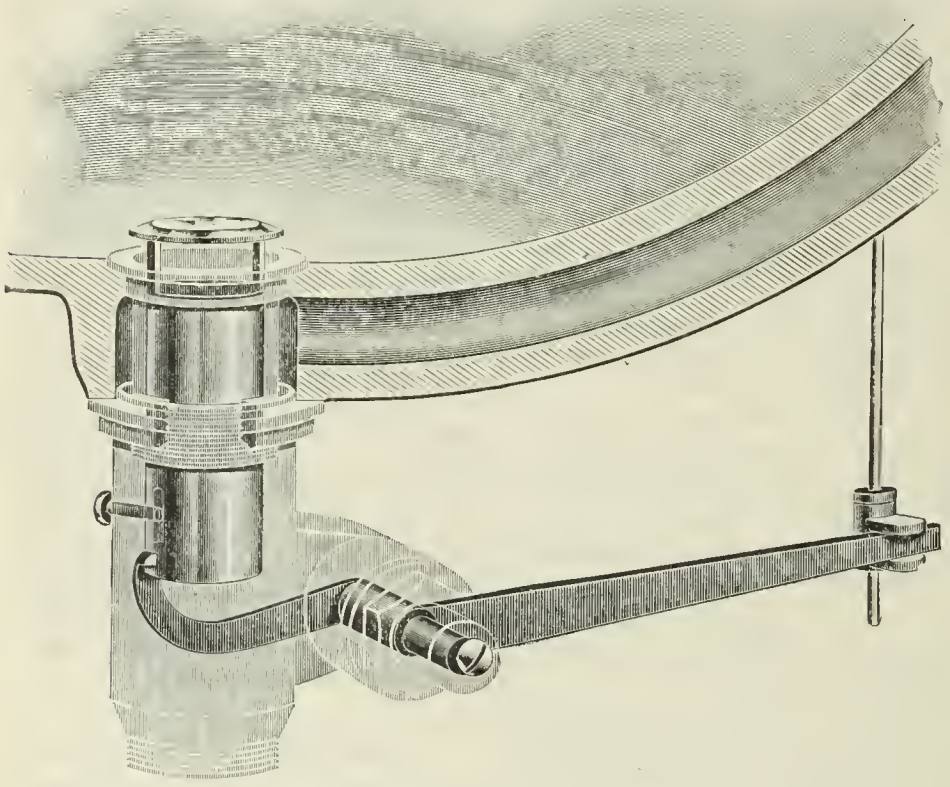
C. H. Herbert. D. Rock. J. J. Wade, J. Sanders. W. J. Corboy, Thomas Conway, Robert Griffith, M. L. Mandable, C. C. Breyer, J. B. Breen. T. M. Murphy, A. Murray, W. H. Cummings, A. G. Weber, G. A. Larson, P. M. Murphy, D. Whiteford, T. C. Boyd, J. J. Doyle, James Barret, Robert Lowden, James Meath, T. P. Culloton, Hugh Watt, John Roland, D. M. Quay, J. M. Simpson, W. Dunham, E. Baggot, A. Young. J. H. DeViney, A. H. Watson, J. O'Neil, James Scanlan.

THE NORTHWESTERN MASTER PLUMBERS' ASSOCIATION was disbanded at Oshkosh, Wis., last week, and the State Master Plumbers' Association was or-

ganized. No other business was transacted than to wind up the affairs of the old association and to merge it into the new. The officers elected by the association for the year are: President, Patrick Ryan, Appleton; vice-president, George McCall, Chippewa Falls; secretary, W. S. Patterson, Appleton; treasurer, Charles Hulett, Racine. The plumbers from outside the city who attended the meeting were W. S. Patterson, Appleton; Patrick Ryan, Appleton; Ed. Thomas, Green Bay; Anton Brehme, Fort Howard; John Abearn, Fond du Lac; Michael Murphy, Fond du Lac; Thomas Hamilton, Marinette.

The Hale Basin Waste and Plug.

The accompanying illustration is a sectional view through a basin showing the Hale basin waste and plug offered to the trade by the Dececo Company, 146 High street, Boston, Mass. The particular purpose of this arrangement



Hale Basin Waste and Plug.

is to prevent the spattering of waste water up the overflow and thus fouling its walls and permitting the accumulation of filth, which decomposes and gives off offensive odors in the room. Besides the spattering during the outflow of water the contents of the basin backs up the overflow, thus allowing dirt to accumulate within. This possibility is overcome by the waste and plug shown in the illustration. Referring to the cut it will be seen that the plug part of the device is simply a method of opening and closing the outlet of the basin from the outside. The upright spindle shown at the right of the engraving extends through the marble and terminates in a knob for the hand to raise and lower, the former motion closing the basin plug and the latter motion opening it. Both of the motions are positive, as shown by the illustration. It will be seen that the plug has a cylinder which extends down about 2 inches below the overflow, and is inclosed in a larger cylinder which serves as the waste of the basin. When water passes through the overflow it descends into this larger cylinder through slots in the lock nut. It will be seen that it is quite impossible by this arrangement for the water discharging from the bowl to reach the overflow. The Hale waste is also made for use with a plug and chain, doing away with the plug lifting device illustrated. Either form, however, we understand, can be applied to any of the patent overflow bowls.

Dimensions of a Small Treadle Lathe.

A writer in *Engineering* states that, having had occasion to carry out some experiments of a mechanical nature, somewhat accurate and complex, he needed a treadle lathe to do a fair share of work in iron, brass and wood. It must cut screws in steel up to 40 threads per inch with accuracy, and be back geared for heavy work. The slide rest must be of the compound type, the mandrel hollow, and an index plate must be attached to it. The accessories to be obtained, if possible, from the makers, as time was limited; the tool must be reasonable in price.

The correspondent failed to find a tool meeting all the requirements and of the proper dimensions in stock in either England, Germany or the United States. He therefore advances the following specifications as embracing the main characteristics of a lathe which he thinks would meet a demand already established: Length of bed, 4 feet 6 inches; swing, 9 inches; three-speed cone for 1½-inch belt; mandrel, 1⅞ inches diameter, ¾-inch bore clear through and fitted with spring chucks with draw bar. The back gear would be 6 to 1, and would be placed under the head stock. The tail of the mandrel would extend beyond the back bearing, and have cone and nut for mounting index plates; the mandrel and boxes would be of steel, hardened, ground and lapped. Machine cut gear wheels to cut from 3 to 64 threads per inch, and right and left hand gear in head stock. The compound slide rest would bear for a length of 14 inches on each side of the bed. It would be slotted for T-bolts, and would be fitted with a sliding stay. The width of saddle would not be less than 6 inches. Stop screws would be fitted to each slide. The leading screw, 1 inch in diameter, with V-thread, ten threads per inch, to be attached to slide rest by divided nut 3 inches long. The rod feed would be placed below the leading screw; this would also work the cross feed. The apron would be of the skeleton form in order to observe what is taking place behind it. A machine vise would be fitted to the slide rest, also an angle bracket for placing the compound rest and the vise vertical if desired. A steady rest and T-rests for wood turning would be provided. The tail stock spindle would have a bore of ¾ inch clear through, and its nose screwed similar to the mandrel. The spindle would be arranged for both lever and screw feed, and a small four-hole turret would be made for the same, a similar draw bar to be provided for spindle as in the head stock. There would be a light countershaft provided to drive drilling and grinding attachments to slide rest.

The writer believes that such a lathe could be made to sell for between $150 and $200.

T. Jefferson Coolidge, treasurer of the Amoskeag Mfg. Company, and a leading authority on the New England cotton manufacturing industry, recently gave to a Boston paper his views as to the removal of cotton mills to the South. Labor at the South, he declares, is lower than in the North, the mills are nearer the cotton fields, and there is a large saving in freight charges. Again, Southern railroads take cotton as fifth class freight, while Northern ones take it as second and third class. Then, coal in New England costs $4.50 a ton, while in the South it does not cost more than $1.50. Mr. Coolidge, moreover, was of the opinion that these reasons for the mills moving South were likely to increase rather than otherwise, and he thought, therefore, that the movement Southward, instead of falling off, would grow steadily larger.

A writer in the February *Forum* endeavors to explain the large gold shipments to Europe in addition to the ordinary merchandise balances by showing that the United States owes Europe a large debt which costs us some $350,000,000 a year to liquidate, as follows:

1. For money spent by American travelers abroad, about	$100,000,000
2. For freights carried in foreign ships, about	100,000,000
3. For dividends and interest upon American securities still held abroad, minimum	75,000,000
4. For profits of foreign corporations doing business here, and of non-residents, derived from real estate investments, partnership profits, &c., about	75,000,000
Total	$350,000,000

Last month the H. M. Myers Company, Beaver Falls, Pa., manufacturers of shovels, spades and scoops, turned out the largest product in any one month in the history of the firm, they having made, finished and shipped over 6000 dozen shovels. The firm have all the orders and specifications on hand that they can take care of until May 1, having recently booked a number of large orders for home and export trade.

STOVE TRADE NOTES.

Ohio Stove Trade.

Reports respecting the stove and range industry in this section and adjacent territory are not uniform and may be divided into three classes: those which are unqualifiedly good and encouraging, those which are decidedly dubious, and those which are moderate and temperate in tone, breathing a conservative spirit, reflecting a moderate trade and hope for the future. Of course the experience of one is not the experience of all during a transition period like the present, and the diversity of views is in some respects desirous, exhibiting an individuality which is the life of business success.

Several foundries write that they did not succeed in starting up until near the middle of January after the blowing out due to stock taking and balancing, but that since that time they have been running full. One foundry couples this statement with a comprehensive review of the past month, saying: "Our output for January was 55 per cent. greater than the same month of 1892, and 70 per cent. greater than the same month in 1893 and 1894, between which two years there was a difference in sales of only a few dollars. Our sales of 1894 averaged $100 a month more than they did for 1893." Adding further: "We have more orders on our books now than we ever had at this season. During the last two or three years the trade has opened up a little earlier each year, and the increase in January sales this year may be accounted for, to some extent at least, by this fact, which would naturally make the other spring months drop off a little; so, on the whole, the spring business may average up about as usual."

This view is substantiated by others, even in other States, and while no "boom" is anticipated a steady improvement, based upon fuller employment of the people, results in increased purchasing power and therefore of consumption. Other manufacturers, while noting an evident lack of confidence, are still able to see an improvement and are disposed to gauge business matters by current events at Washington, and the political death of the present Congress on March 4 is awaited with some impatience. Other sections, however, evidently have met with nothing encouraging and can see no improvement in the immediate future. While foundries have been running full time, sales have been 25 per cent. less than in January, 1894, while the number of customers asking for indulgences is increasing and customers are disposed to contract rather than extend purchases. No decided improvement is looked for until fall.

After all is said and done, however, it is evident that there is a general sentiment that there is a gradual return of confidence, and while business may fluctuate the tendency is toward recuperation, and this view is sustained by the larger purchases of pig iron by many foundries and mills.

ODD PLATES.

A MEETING of the creditors of the National Vapor Stove & Mfg. Company of Lorain, Ohio, was recently held in Cleveland for the purpose of reorganizing in the interest of those who purchased the plant at a receiver's sale. A new company was organized with a capital stock of $125,000, the directors being Joseph Collwell. H. B. Hunt, Charles E. Adams, J. B. Sage. Ira B. Bassett, T. A. Reilly and J. A. Reaugh. The Board of Directors elected J. E. Adams president and general manager, H. B. Hunt, vice-president and Joseph Collwell, secretary and treasurer. We understand it is the intention of the company to put the factory at Lorain, Ohio, in operation at once with a full force of men.

IN *The Metal Worker* of January 26 an error was made in stating that Geo. W. Graves was one of the corps of representatives of Eugene Munsell & Co., 128 Water street, New York, their relations having been severed during the latter part of 1894. The house are now preparing to push their line of gas and gasoline stoves. The gas cooking attachment for coal ranges has proven quite popular with the trade. They also have some attractions in mica for stove manufacturers.

ON TUESDAY of this week the plant of the Perry Stove Company, Albany, N. Y., resumed operations with a force of about 75 men.

ONE OF THE HANDSOMEST CALENDARS for the new year that has reached us is that just sent out with the compliments of the Weir Stove Company of Taunton, Mass. Mounted upon very heavy cardboard are two rollers working in metallic journals, one roller being placed near the top of the card and the other an equal distance from the bottom. Upon the rollers is wound a long sheet printed with the different months of the year. Each month is a design in itself, and being printed in colors presents an attractive appearance. The borders of the card upon which the calendar is mounted are embellished with designs of a floral and pictorial character, while across the top is the word "Glenwood," and across the bottom the name and address of the company, with an indication of the line of goods manufactured. Accompanying the calendar is an announcement in the shape of a four-page folder illustrating the Glenwood hot air heater and the Glenwood combination hot air and hot water heater, the latter being made in four sizes and can be furnished with either cast or steel radiator. The company state that they expect to give the trade during the year a number of new and original additions to their already entenslve lines.

THE CHICAGO & ERIE STOVE COMPANY of Erie, Pa., are offering the trade the Rapid Helper six hole range, fitted with their patent oven. The latter is constructed with steel bottom so made as to prevent its buckling. This is accomplished by means of cast iron adjustable braces, so arranged under the bottom oven plate as to prevent it from springing out of shape. By opening the flue door this improvement can be partially examined. The manufacturers state that these patent ovens heat very rapidly and are therefore economical in the use of fuel. Three sizes and many styles of the Rapid Helper are offered, all of which have a special flue strip for soft coal.

AT THE ANNUAL MEETING of the Syracuse Stove Works, Syracuse, N. Y., Francis Kernan was elected president and treasurer; Fred. J. Finck, vice-president; N. E Devereux, secretary and William H. Landers, superintendent.

AT THE ANNUAL MEETING of the stockholders of the Foster Stove Works, Ironton, Ohio, J. D. Foster, C. A. Hutsinpillar, L E. Marting, Charles Alexander, E. Horschel, O. P. Doty and H. A. Marting were elected directors. At a meeting of the board a 5 per cent. dividend was declared and officers for the ensuing year chosen. J. D. Foster was elected president; C. A. Hutsinpillar, vice-president; L. E. Marting, secretary and treasurer, and Charles Alexander, superintendent.

THE 1895 STAFF of traveling salesmen representing the Syracuse Stove Works of Syracuse, N. Y., include the following, who will visit dealers in the territory named: George N. Pickstock in Western New York, Col. R. Daggett in Central New York, C. H. Ingham in Eastern New York, Ed. A. Wilbur in Michigan and Wisconsin, and George M. Eggleston in New York City and the State of New Jersey. The company resumed operations at their works on Wednesday, January 30.

A RECENT VISITOR at the Cincinnati office of *The Metal Worker* was W. E. Anthony of W. E. Anthony & Co., Detroit, Mich., the Michigan and Minnesota representatives of the Portsmouth Stove & Range Company, Portsmouth, Ohio. Mr. Anthony expresses himself as highly gratified with the brilliant reception the Model wrought steel ranges have met with in the territory named.

GEO. W. GRAVES is about to locate at Rochester, N. Y., where he will handle several lines of heating and cooking goods as manufacturer's agent.

THE DIFFERENCES between the Albany, N. Y., molders and the stove manufacturers, which were of a mild character, are reported to have been amicably adjusted. It is probable that all the foundries in the city, which are

busy with annual inventory, will soon be in operation.

THE THATCHER FURNACE COMPANY, 240 Water street, New York, are sending out a blotter calendar for February, so that a reminder of the Thatcher furnaces and ranges and the Champion steam and hot water heaters will be constantly before the trade.

N. H. SQUIRES, Secretary of the Torrance Iron Company, Troy, N. Y., was a recent visitor among the stove trade in New York. The company make a large line of malleable stove trimming and appliances, lifters, shakers, turnbuckles, draft knobs, &c.

FOUNDRIES Nos 1 and 2 of the Reading Stove Works, Reading, Pa., made their first heats since Christmas on January 31. Foundry No. 3, at Orrton, across the river, operated by the same corporation, will also be in operation at an early day. The combined plants of these works give employment to upward of 800 hands.

THE BELLAIRE STOVE WORKS of Bellaire, Ohio are now running half time with a full force, but Manager Johnstown states that the works will be operated on full time about the middle of the month. The outlook is said to be encouraging.

THE WOMEN'S EDITION of the Syracuse *Post* bearing date of February 2, contains various departments covering Finance and Trade, Music, Education, Medicine and Surgery, Religion, Child Life, Physiology, Clubs and Societies, Political Equality, Household Economics and Philanthropy, are all edited by women. The advertisements are of an equally varied character, among the number being that of the J. F. Pease Furnace Company of Syracuse, N. Y. In the space occupied are the opinions from the women of Syracuse concerning the Pease Economy heaters, being, we understand, representative expressions of over 2000 Syracuse women who are using company's heaters and furnaces.

THE MONARCH STOVE COMPANY of Mansfield, Ohio, have issued an exceedingly attractive catalogue of the Monarch stoves and ranges designed for using gas and gasoline as fuels. The publication is known as Catalogue E and consists of 72 pages, profusely illustrated and bound in attractive paper covers with embossed side title, a portion of which is executed in old gold. A feature which tends to give a rich effect to the catalogue is the printing of the pages, the body of each being a delicate brown with white border, while the text appears in black with headlines in blue. The goods shown cover a wide range of gas and gasoline constructions. The opening pages are given up to the Monarch New Method, an artistic creation, fitted with patent vaporizing chambers, Monarch patent sight feed, direct action needle valves made of Tobin bronze, burnished brass burner cylinders with double seamed bottoms and cast heat collars supported by bolting to the top. Following this is the Regal Monarch, a richly treated cabinet range furnished with new high shelf and sub-heating flame; the Monarch range with Russia iron oven and elevated tank; several varieties of the Monarch with burners operated from a single generator; Monarch juniors with single generators and also with individual burners and a varied line of ovens, broilers, burners, &c. Several pages are devoted to repairs and to cuts of the Monarch trade-mark for newspaper and other advertising. The latter portion of the catalogue is given up to Monarch stoves and ranges for gas, these including cabinet and table stoves, hot plates and heaters. Attention is also given to independent connections, burners, rubber tubing, &c.

A NOTABLY HANDSOME PUBLICATION is issued by White, Warner & Co., Taunton, Mass., in the interests of their household ranges. It is a card shaped like a harp, the frame of which carries some dozen gorgeous roses of many varieties. Each blossom has on it the name of the month, and the days of the month are recorded literally *sub rosa*. It is a beautiful piece of coloring and the shading of the different varieties includes all colors between the light tea and the deep red. Those who have been fortunate enough to receive these calendars will see the whole year in rose color, and will begin each month by turning back a lovely blossom.

THE MANY FRIENDS of Secretary Thomas of the National Association of Stove Manufacturers will be glad to learn of a slight improvement in his condition since our last issue went to press. While the change for the better is thus far but slight, there are strong hopes on the part of his physician and family that if the improvement continues through the next few days Mr. Thomas will before long be able to get out.

COL. WILLIAM LOGAN CLARKE, secretary of the Phillips & Buttorff Mfg. Company, Nashville, Tenn., died in that city of typhoid pneumonia on January 19, after a brief illness, at the age of 56 years. He was a business man of exceptional ability and was much respected by his friends and associates. A widow and six children survive him.

H. GILBERT HART of Hart & Crouse, Utica, N. Y., has been spending a few days in Chicago.

THE FOX FURNACE COMPANY of 28 Vincent street, Cleveland, Ohio, state that their business is showing a remarkable increase, giving evidence of the wide popularity of the Fox furnace. The statement is made that the company's business for January, 1895, was three and a half times as great as during the same month in 1894. The company are kept busy, even in February, which is ordinarily a dull month in the furnace business.

RECENT ADVICES from Evansville, Ind., are to the effect that the strike at the works of Kiechle, Brentano & Oberdorfer, has resulted in more or less disturbance. The report states that some non-union molders from Louisville, who were being taken to the foundry, were attacked by the strikers and some of the men badly injured.

THE CARTON FURNACE COMPANY of Utica, N. Y., state that the fire which visited their works on Sunday, February 3, will not in any way interfere with the conduct of their business, as the damage was confined almost altogether to their small foundry. Their duplicate patterns are intact, and with the stock in their storage building the company are in a position to promptly fill orders for any and all sizes and styles of the Carton heaters. Their large foundry, with slight repairs, will be in full operation on Monday, the 11th inst., and the company's new foundry, now under construction, is expected to be ready by March 1. It is interesting to note in this connection that while the fire was in progress on the 3d inst. the company had plans and details for the erection of a new structure, and before the fire was fairly extinguished gangs of men were at work clearing away the *débris*.

The Chicago Drainage Canal.

At a recent meeting of the Board of Trustees the annual reports of the chief clerk and the chief engineer were presented. The financial statement was as follows:

Receipts of the District from organization to December 31, 1893	$5,381,757.78
Receipts for the past year	7,399,367.93
Total Receipts	$12,781,225.71
Expenditures of the District from organization to December 31, 1893	5,186,504.83
Expenditures for the past year	6,292,134.85
Total expenditures	$11,478.639.68
Balance on hand December 31, 1894	$1,302,586.03

The report of the chief engineer reviewed the work from the beginning, and showed the condition of the undertaking at the present time. Since January 1, 1894, nine sections have been equipped and the plant for working them perfected; eight sections have changed hands, and one has been abandoned by the contractors.

On 11 sections only has the work been vigorously prosecuted. In 1895 the work will begin with 28 sections equipped, and much greater progress is predicted, the completing of the work being expected in the fall of 1896. A safe estimate of the value of the machinery used by the contractors is placed at $3,000,000.

The rate of progress of the work reached a maximum in August, when the amount earned by the contractors was $666,481.81, and since then the average has been $568,031.32 per month.

Several plans have been proposed and considered for the controlling works at Lockport, the one combining the greatest advantages and least cost being a combination of lifting gates and a section of bear trap dam. There will be eight of these gates, working between solid masonry piers, the gates being raised vertically by mechanism operated from bridges spanning the space between the piers. Each space will be 30 feet wide and dam 160 feet between bulkheads. The estimated cost is $160,000.

One of the special features noted in the detailed report of sections is the performance of two hydraulic dredges on section B. The two dredges excavated 1,538,387 cubic yards in 882½ working days, or an average of 1731.9 cubic yards per day each. The total removed to January 1, 1895, is 12,608,806 yards of glacial drift and 5,358,968 yards of solid rock, or $48\frac{6}{10}$ per cent. of the glacial drift, $43\frac{57}{100}$ per cent. of the rock and $45\frac{43}{100}$ per cent. of the entire work.

One of the most flourishing cities in the Indiana gas belt is Elwood, which, according to a recent statement, has some 30 large industries, capitalized at $4,350,000 and employing 3270 workers.

The Ohio Falls Car Works have contracted to build 1000 box cars for the Pennsylvania Railroad.

The Manufacture of Tubular Articles.

From United States letters patent issued to C. T. Cayley and R. S. Courtman of London, England, and assigned to the United States Projectile Company of Brooklyn, N. Y., we take the accompanying engravings and present the following description of a method of making tubular vessels or bottles for containing gases under pressure. The vessel is made from a solid block of metal, the various steps in the process of manufacture being illustrated in the drawings, Figs. 1 to 10. Fig. 1 is a view of the solid block, Fig. 2 shows the block after it has been pressed to the shape of the bottom of the mold. Fig. 3 is a sectional view of the block after it has been cupped by the action of a punch. In Fig. 4 the cup has been drawn by one or more operations, while heated, nearly to the length, diameter and thickness of the finished article. In Fig. 5 the cup has been swaged down and closed at one end to enable it to be drawn through a die and over a mandrel as shown. Fig. 6 shows the completed blank, formed from the partly completed blank seen in Fig. 4, by subjecting the latter to a process of cold drawing. Fig. 7 shows a bottle completely formed from the finished blank, Fig. 6. Fig. 8 shows the method of closing the end and Figs. 9 and 10 show the dies used successively in this process.

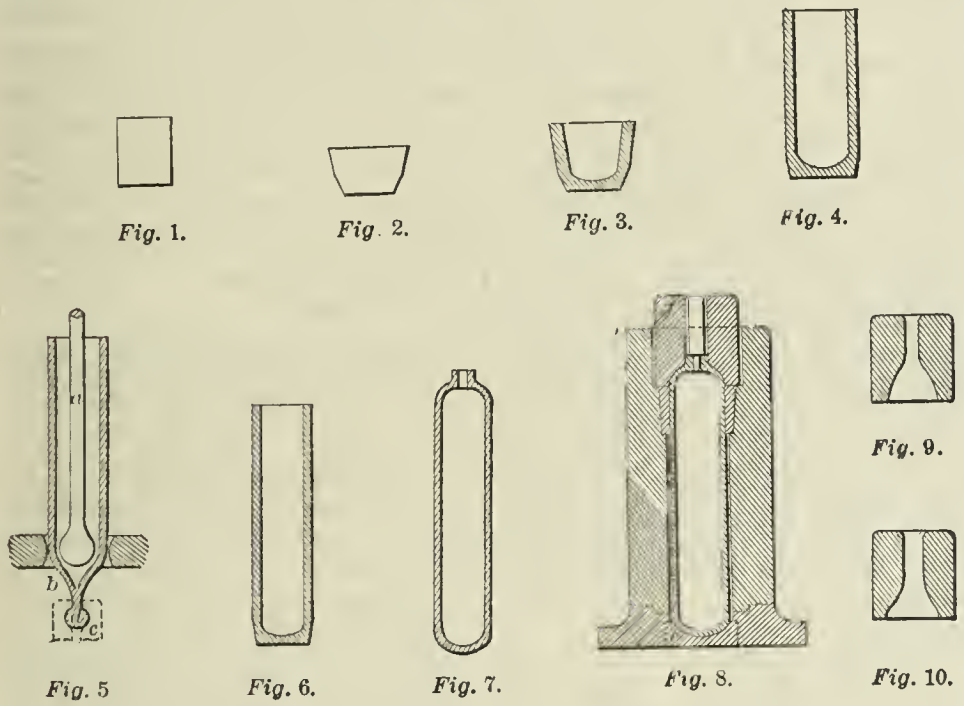


Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5 Fig. 6. Fig. 7. Fig. 8. Fig. 9. Fig. 10.

METHOD OF MAKING TUBULAR ARTICLES.

The block is first placed in a mold and pressed to the shape shown in Fig. 2, after which, and at the same heat, it is placed in a second mold and by means of a punch is worked into the form of a hollow cup, Fig. 3. The initial tubulation of the metal being thus effected, the cup is placed upon a mandrel and submitted to a process of hot drawing through dies of successively diminishing size, to which the blank is subjected in proper order, being reheated as often as may be necessary. The block has now been brought substantially to the shape shown in Fig. 4. If the blank is to be used in manufacturing a tube about 4 feet or less in length, it may be finished by merely subjecting it to a process of cold drawing by which it is reduced to the proper length and thickness and brought to the exact diameter required, thereby constituting a complete, finished metallic blank, ready for use in the process of manufacture of the complete, finished tubes, bottles, or tubular vessels about to be described.

We take the following description of the process for lengths greater than 4 feet: "If, however, the tube, bottle or tubular vessel is to be of greater length than 4 feet, or thereabout, we can, by known methods, subject the blank described above to the action of rolls, after having punched, cut or otherwise removed its closed end and inserted a mandrel, said rolls having a series of grooves of diminishing size. After reducing it very nearly to the length, diameter and thickness it will have when finished, it is preferably pickled, to remove the oxide, or scale, from its surface, is then subjected to an annealing process and finally finished by cold drawing. By the latter process we are enabled to reduce the metal to any required thickness, however slight, and we impart to it great strength, stiffness and toughness. We may use for this cold drawing process any known method, but we prefer that illustrated in Fig. 5 of the drawings. This method consists, substantially, in closing and swaging or shaping the end *b* of the tube in such manner as to form thereon a strong, prolonged neck, or shank, 4, provided at its extremity with a knob or other suitable holding device, *d*. This device is placed within the grasp of jaws *c*, reciprocated by any suitable means. Within the tube we insert a mandrel, *a*, having upon its end a ball of such size as to impart the proper interior diameter to the tube. The exterior diameter is imparted by means of a circular die, having its edge convex, or rounded, and lying in suitable position with relation to the interior device *a*. The cold drawing may be completed at a single operation, or it may be effected by repeatedly drawing the tube, the diameter of the die and mandrel being slightly diminished at each operation. By this process we produce not only tubular blanks suitable for the manufacture of bottles or tubular vessels capable of holding gases under pressure, but we can also form tubing sections of any suitable or ordinary length, diameter and thickness.

"In the manufacture of blanks for the production of bottles we operate upon a solid block of steel or iron by substantially the same method as that described until it is reduced to the form shown in Fig. 6, the blank being of a length somewhat in excess of that of the bottle when the latter is finished. We then cut off the surplus length from the upper or open end of the tube, and turn or otherwise shape the bottom or closed end, to bring it to the required shape and thickness. The open end of the blank is then heated and placed in a mold, Fig. 8, in which the open end of the blank is to be closed and its neck formed. At the lower end of the mold is a block, *e*, to support the blank against the action of the die *f*, or dies, Figs. 9 and 10. These dies, when more than one are used, operate successively, preferably by hydraulic pressure. The matrix recess in each die is successively approximated to the complete or finished shape, until the last is reached, which imparts the necessary form. The matrix recess in each die opens into a concentric bore having a form adapted to receive and aid in forming the neck of the bottle, this operation being completed by the use of a mandrel having a reduced end, which is passed down through the bore 17 in the die to form the opening in the neck which is to receive the valve."

The United States Projectile Company of Brooklyn are using the process in the manufacture of bicycle tubing, using special Swedish steel billets.

One of the largest pieces of bronze casting ever made in the United States was shown lately in the foundry of A. T. Loome, in New York City. It is a statue of the late Major-General Devens of Massachusetts, the work of Olin L. Warner. The figure, which is 9 feet 6 inches in hight, was cast in one piece, the arms only being separate. It represents the deceased soldier in the uniform of the United States army, and is dignified in treatment, the workmanship of the draperies being particularly excellent. The statue is a commission from the city of Boston, where it is to be erected. The St. Gaudens statue of Peter Cooper, to be placed in front of the Cooper Institute, which was also cast by Mr. Loome, is now completed and will shortly be placed in position. The figure is represented seated and was cast in two pieces, over 6000 pounds of metal being used in its construction.

The whaleback steamer "Pathfinder" and her consort "Sagamore," have broken all records for the number of round trips made by a steamer and consort during the season. Since leaving Chicago on April 5 last the "Pathfinder" and "Sagmore" have made 24 round trips, 22 of these being from Duluth to Ohio ports with iron ore. In all, the two boats have carried about 120,000 gross tons of iron ore, 9000 tons of coal and 500,000 bushels of grain. These two vessels are part of the Minnesota Iron Company's fleet. At average current rates, their gross receipts for the season must have been about $95,000 for ore, $7500 for grain and $1800 for coal.

The New York State Superintendent of Public Works, in his annual report, says that the time is fast approaching when operation of the canals of the State in a practical manner must cease unless the canals are improved so that the business done thereon can be done at a profit to the boatmen.

TRADE REPORT.

The Iron Market.

Pig Iron.—The New York market is without important change. Consumers purchase indifferently and orders are chiefly for moderate quantities to be delivered within a short time. The offering is much the same as it has been for some time past, with competition keen, particularly on the lower grades of Iron. Prices have not varied greatly, but the market is still rather weak. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

Taking everything into consideration it may be said, as regards Philadelphia, that the Pig Iron market is better than it was a week ago. There is more business being done, there is more inquiry, and prices, while not quotably dearer, are firmer and in some cases fractionally higher. Consumers are not taking large lots, however, although in the aggregate sales during the past week have been quite heavy. The foundry trade seems to have got fairly to work after several weeks shut down, and as they were all bare of stock buying has been a necessity, and will continue to be so in case orders come in as expected. Sales have been at all sorts of prices, varying according to quantity, point of delivery and grade of Iron required. The lowest for Philadelphia would be at the following inside figures, and from that upward, with 20¢ @ 30¢ less for all grades delivered at Harrisburg, York, Baltimore, &c.:

Standard No. 1 Foundry X	$12.00 to $12.50
Standard No. 2 Foundry X	11.00 to 11.50
No. 2 Plain	10.75 to 11.00
No. 1 Soft	11.50 to 11.75
No. 2 Soft	10.75 to 11.00

Chicago advices indicate that local Iron has been in better demand the past week in that market. One contract of 1000 tons was entered and a good number of small sales were made. Shipments on old orders are increasing, as consumers find that they require much more material than was expected. Foundrymen are carrying no stocks in their yards and are constantly urging more prompt shipment from the furnaces. Sales of about 2000 tons of Southern Iron are reported in various lots, but the only character of Southern Iron in demand is soft grades. Prices appear to be firmly maintained. Lake Superior Charcoal is quiet. Quotations are as follows, for cash:

Lake Superior Charcoal	$13.00 to $14.00
Local Coke Foundry, No. 1	10.25 to 10.50
Local Coke Foundry, No. 2	9.75 to 10.00
Local Coke Foundry, No. 3	9.50 to 9.75
Local Scotch	10.50 to 11.00
Ohio Strong Softeners, No. 1	12.50 to 13.00
Southern Silvery, No. 1	11.50 to 11.75
Southern Silvery, No. 2	11.25 to 11.50
Southern Coke, No. 2	10.00 to 10.50
Southern Coke, No. 3	9.75 to 10.25
Southern, No. 1, Soft	10.25 to 10.50
Southern, No. 2, Soft	9.75 to 10.25
Alabama Car Wheel	17.50 to 18.00
Jackson County Silvery	15.50 to 16.00
Other Ohio Silvery	14.25 to 14.50

In the Pittsburgh district the week has been without special features. There is only a limited demand for Foundry Iron, and prices depend largely upon the size of the order and the conditions surrounding it. We quote as follows, for cash:

No. 1 Foundry	$10.50 to $10.65
No. 2 Foundry	9.75 to 10.00

Several encouraging features have been developed in the Cincinnati Pig Iron situation during the past week and an increased volume of business has been transacted. Between 15,000 and 20,000 tons of Iron have been sold by local factors for distribution to diversified interests, extending over one to four months in delivery. Quite a number of mills as well as foundries of various kinds have been in the market and the freer purchases indicate either more confidence in the Metal market or increased orders for finished product making it necessary to cover contracts. Probably both these facts and opinions have influenced purchases. On the other hand, while furnaces are still taking orders at current quotations, it is evident that they have a firmer feeling and are more encouraged respecting the near future. At the close there are a number of buyers in the market and several important transactions are pending. Quotations are without essential change; transactions, as a rule, are based more upon inside than outside quotations, but the tone of the market is a little harder at the close. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.00 to 9.25
Southern Coke, No. 3	8.50 to 8.75
Ohio Soft Stoue Coal, No. 1	14.50 to 15.00
Ohio Soft Stone Coal, No. 2	14.00 to 14.50
Lake Superior Coke, No. 1	11.75 to 12.25
Lake Superior Coke, No. 2	10.75 to 11.50
Hanging Rock Charcoal, No. 1	16.00 to 16.50
Hanging Rock Charcoal, No. 2	15.50 to 16.00
Tennessee Charcoal, No. 1	13.00 to 13.50
Tennessee Charcoal, No. 2	12.00 to 12.50
Standard Southern Car Wheel	15.75 to 16.75
Lake Superior Car Wheel and Malleable	14.25 to 14.75

The St. Louis Pig Iron market is if anything less favorable than when last reported. Sales are reported as small, and consumers are all restricting their purchases to limited quantities, with the possible exception of the local Pipe works, who have bought between 5000 and 6000 tons since the first of the year. Prices are weak and appear top heavy. No. 2 Foundry is quoted at $6.75, f.o.b. cars Birmingham, and this price has been shaded in some cases. The general situation is anything but encouraging. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.00 to $10.25
Southern Coke, No. 2 Foundry	9.50 to 9.75
Southern Coke, No. 3 Foundry	9.00 to 9.25
Southern Car Wheel	16.00 to 16.50

CONTRACTORS in Pipe Fitting will find at the works of the Eastwood Wire Mfg. Company, Belleville, N. J., a full line of Perfection Bronze Fittings such as are used in connection with digesters of paper mills and chemical works. The company are also prepared to furnish Perfection Bronze Castings up to 9000 lb in weight. They are now at work on an order for 5-inch Flange Cocks for use in a chemical plant.

Metal Market.

Pig Tin.—Spot stock has been under close control throughout the week, and prices have been held at a sharp premium over those at which contracts for the current month were sold and more or less freely offered. The premium was due to the fact that the concentration of spot supply in the hands of a few dealers left little available Tin elsewhere for speculative purposes. The market closed quiet but firm. Retail business has been moderate, with prices for small lots of Straits from store unchanged at about 15¢ ℔ lb. for Pig and 16¢ for Bar. The visible supply on the 1st inst. is computed at 24,546 tons, against 24,614 tons on January 1. Of this amount 1594 tons was on the spot here and 3200 tons afloat for this country. London had 10,157 tons spot and 4420 tons afloat. The balance consisted of Continental holdings and stock afloat for that quarter. Compared with a year ago, the visible supply shows an increase of about 7000 tons.

Copper.—Business has been rather slow and prices have weakened slightly under the influence of freer offerings of some brands for both prompt and near future delivery. The severe weather has interfered somewhat with the demand for both Ingot and Manufactured Copper. Small lots of Lake Ingot from store are quoted at 10½¢ ℔ lb.

Pig Lead.—The market has been remarkably steady. No fluctuation to speak of in prices has taken place. Buying interest has not been at all brisk, but the demand increased somewhat the past few days and about 400 tons were sold, chiefly for early delivery. The situation at the primary sources of supply is regarded as strong statistically. No noteworthy improvement has developed in the demand from small consumers, who are buying very indifferently. Retail prices for small parcels of American Pig rule at 3¼ @ 3⅝¢ ℔ lb.

Spelter.—In sympathy with reduced cost at the West the market here has weakened further, and is at present in poor shape. The lower prices have stimulated buying to a very moderate extent only. Prime Western brands in small parcels are quoted at 4¢ @ 4¼¢, with inferior brands at slightly lower prices.

Antimony.—About the usual jobbing business is passing. Prices on small lots remain steady at 9¼¢ @ 9½¢ ℔ lb for Cookson's and 8¢ for Hallett's.

Tin Plate.—Very low prices have served to keep up a fairly live interest in Cokes for future delivery. Otherwise the market has been "flat, stale and unprofitable." Spot business, which is still moderate and of a hand to mouth character, has been seriously contracted by the severe weather prevailing in this section, which has effectually stopped all out of door work. Prices are still more or less weak, with a slight decline quoted in some lines.

Stocks in jobbers' and importers' hands are good and the assortment fair. Production on the other side has been materially reduced through the closing down of about 50 % of the Welsh works. On the other hand the domestic producing capacity is increasing rapidly by the starting up of American plants under the new wage agreement.

A special London cable dispatch of February 6, to *The Iron Age*, reports on the British Tin Plate market as follows: In Tin Plate there has been scarcely anything doing. Buyers decline to operate beyond small orders in hand. There is less American inquiry. Bessemer Cokes have been pressed for sale at as low as 9/ without finding buyers and Siemens are offered at 9/4½. Quotations f.o.b. Wales are given as follows:

Bessemer Cokes, IC 14 x 20.....	9/	@	9/1½
Siemens Cokes, IC 14 x 20.....	....	@	9/4½
Ternes, 20 x 28.....	18/	@	23/
Charcoals, IC 14 x 20.....	10/6	@	13/

Sheet Iron.—The movement in both Black and Galvanized Sheets has been moderate during the week under review. The jobbing demand has been restricted by the severity of the weather. Manufacturers' agents say, however, that a good deal of inquiry is coming in from the larger consumers, who are anxious to close for their spring and early summer requirements, being evidently satisfied that it is a good thing to buy at present prices. Jobbers' quotations for small lots of No. 27 Common Iron from store are about 2.65¢. Galvanized Sheets in small lots rule at 75 and 5 % @ 75 and 10 % off.

Trade Notes.

THE SWARTS METAL COMPANY, of which S. Swarts is president, have opened an office and salesrooms at 120 West Lake street, Chicago. They are manufacturers, jobbers and exporters of Metals, handling high grade Babbitt, Solder, Stereotype and Electrotype Metal, Pig Lead, Pig Tin, Copper, &c. They will shortly issue an illustrated catalogue describing different grades of Metals and Alloys.

THE CONNECTICUT PLATING COMPANY, 217 North Tenth street, Philadelphia, are calling the attention of the trade to their facilities for Electro Plating in gold, silver, nickel and other metals, and state that they are especially equipped for Electro Bronzing heavy castings for architectural and other works.

THE HUGHES-TAYLOR CAN COMPANY, Baltimore, Md., have been incorporated by Charles J. Hughes and Henry C. Winebrenner with $30,000 capital.

THE OLIVER SHEET IRON MILLS, Easton, Pa., which have been idle for several years and which have been recently put in repair, will, it is announced, be put in operation with a large number of hands in a few days.

Gustaf von Leibhaus, a German official, is now in the United States inspecting the sewerage systems of American cities for the purpose of reporting thereon to the Berlin authorities. He regards the Washington system as superior to that of New York, Philadelphia or Baltimore. The sewerage system of Paris, he believes, leads the world.

CONDITION OF THE

Hardware Trade.

IT IS GRATIFYING to hear from many who have made a careful comparison of January, 1895, with that of 1894 that the present year begins with greater promise than did the last. A number of merchants and manufacturers advise us that not only have they sold a greater quantity of goods during the past month than a year ago, but that the value of goods is greater. This is certainly an encouraging feature considering the fact that goods are probably from 20 to 25 per cent. cheaper. Orders are reported to be coming in more freely, and it is evident that trade is gradually improving. The severe weather which has prevailed in many parts of the country has, however, had, and still has, the effect of retarding the demand. Careful buyers are watching the market closely and note with interest the improved tone in Wire Nails, Barb Wire and some other goods that lie near the raw material and on which prices have been exceptionally low. The advances which have taken place have a good effect on the tone of the market, though as yet there has been no general strengthening of prices, which continue on many lines weak and irregular, lower quotations being made than ever before. In this condition of things the trade are naturally reluctant to place orders beyond their requirements, unless it be in a few cases where the buyer is confident the lowest prices have been reached and that it is a safe policy to order. There is, however, comparatively little of this, as prices have for so long a time been tending downward that it is a question with many as to whether or not a turn may be expected in th near future.

Advices from Chicago.—The volume of business in Shelf Hardware is not so large as it was. The extremely cold weather, the worst known in this section for years, has been of such prolonged duration that it interferes seriously with outdoor work and has cut off the demand for important classes of material. Seasonable goods for spring delivery are in fair request, and staple goods are doing well when they can be had at the low prices recently made by the large jobbing houses. A remarkably strong demand is noted for Stamped, Pieced and Japanned Tinware. Jobbers are having much difficulty in keeping up their stock and are buying from each other in order to meet the requirements of their customers. Aluminum Goods are also going remarkably well considering the comparative dullness of this ware. Numerous inquiries for Tinners' Tools and Machines are now coming forward, more than for three years past, showing that people are again starting into business. This is taken as a strong indication that confidence is being restored among the people at large. Heavy Hardware is in fair condition with a healthy movement, although the volume is not as large as jobbers would like to see. Everything taken is going at once into the hands of consumers and any increase in consumption is therefore perceived immediately.

Notes on Prices.

Wire Nails.—The improvement referred to in our last issue still holds, the market being firm with an active demand and the order books of the manufacturers well filled. The tone of the market is decidedly firmer and prices are well maintained. There is an active demand coming in from the larger and the smaller trade, and all indications point to the fact that stocks in the hands of the trade generally are exceptionally light. At the same time it is pointed out by the manufacturers that the production of Nails is considerably less than it was a year ago and in their opinion the demand will easily take care of all the goods which can be manufactured during the current half year.

Advices from Chicago.—Manufacturers maintain the firm position noted last week. Large inquiries are in hand, some for delivery running up to the opening of navigation. Jobbers have not advanced their prices, some continuing to sell at 95 cents, while others ask $1 to $1.05.

Cut Nails.—The Cut Nail market continues without important change. Small lots from store, New York, are quoted at 90 cents. The volume of business is moderate and the tone of the market slightly irregular.

Advices from Chicago.—Manufacturers report only a moderate trade at unchanged prices. Jobbers sell small lots from stock at $1.

Barb Wire.—In our last report we referred to the slightly better feeling in the Barb Wire market, without, however, a quotable advance. During the past week there has been a still further improvement and prices are a little higher. Small lots from store in New York are held at $2.15 to $2.20. There is an increasing demand, and the outlook for the season's business is promising.

Advices from Chicago.—A large trade is in progress, which is particularly heavy to the Southwest. Texas and the Indian Territory appear to be the points now developing the strongest demand. Prices are fairly firm, but it is stated that some concessions are being made to secure as large a share of the Southwestern business as possible. The demand in this immediate vicinity is about as it has been, some jobbers reporting a good run of orders for spring delivery. The general demand for Wire products is steadily increasing and the leading establishments expect to be crowded to their utmost capacity to meet the requirements of their customers in March. Jobbers' quotations range from $1.55 to $1.65 for carloads of Painted and $1.90 to $2 for Galvanized.

Shot.—An advance of 5 cents in the price of Shot is announced under date January 30. The following are the revised prices, terms net 30 days, or 2 per cent. discount for cash in 10 days, a discount of 5 cents per bag (25 pounds), and a special discount of 2½ per cent. being allowed on lots of one ton and upward, bought, invoiced and paid for at one time:

Drop Shot up to B, 25-pound bag.....	$1.15
" " 5 "	.30
Buck Shot, 25-pound bag.....	1.40
" 5 "	.35
Chilled Shot, 25-pound bag.....	1.40
" 5 "	.35
Dust Shot, 25-pound bag.....	1.75
" 5 "	.40

Bright Wire Goods.—The market for Bright Wire Goods has recently been showing evident marks of weakness, and prices are lower. There is, however, a good deal of irregularity in the quotations named by the different manufacturers, some of whom refrain from pressing their goods in view of the still lower prices of their competitors.

Wrought Goods.—The market for Wrought Goods is in an unsatisfactory, unsettled and somewhat demoralized condition, prices generally being low and very low quotations being made by some manufacturers. The lowest prices current are, it is understood, on goods of inferior quality and light weight. It will be worth while for the trade to look carefully into the quality of goods in this line, as well as prices at which their orders are accepted.

Wrought Iron Pipe.—The Wrought Iron Pipe and Tube Manufacturers' Association met at the Monongahela House, Pittsburgh, on Tuesday and Wednesday of last week, this being the first meeting of this organization held for some months. Sixteen firms were represented in person, as follows :

AMERICAN TUBE & IRON COMPANY, Middletown, Pa., and Youngstown, Ohio.
A. M. BYERS & Co., Pittsburgh, Pa.
CONSHOHOCKEN TUBE COMPANY, Conshohocken, Pa.
DUQUESNE TUBE WORKS COMPANY, Pittsburgh, Pa.
SPANG, CHALFANT & Co., Pittsburgh, Pa.
NATIONAL TUBE WORKS COMPANY, McKeesport. Pa.
OIL CITY TUBE COMPANY, Oil City, Pa.
OIL WELL SUPPLY COMPANY, Pittsburgh, Pa.
MORRIS, TASKER & Co., INC., Philadelphia, Pa.
PENNSYLVANIA TUBE WORKS, Pittsburgh, Pa.
THE PITTSBURGH TUBE COMPANY, Pittsburgh, Pa.
RIVERSIDE IRON WORKS, Wheeling, W. Va.
WESTERN TUBE COMPANY, Kewanee, Ill.
COHOES TUBE COMPANY, Cohoes, N. Y.
SYRACUSE TUBE COMPANY, Syracuse, N. Y.

Frank J. Hearne of the Riverside Iron Works, Wheeling, W. Va., was chairman, and Joseph Brown of Pittsburgh secretary. The object of the meeting was to consider the advisability of advancing prices on Pipes and Tubes and to take any other action that would improve the condition of this industry, which has been unsatisfactory for some time. After a thorough discussion it was resolved to rearrange the lists and discounts on Pipes and Tubes and to make slight advances in prices. We give below the new lists and discounts adopted, as follows:

Wrought Iron Pipe, Butt Welded.

Diam. inches.	Black.	Galv'd.	X strong.	XX strong.
⅛	$0.05½	$0.08	$0.11	$0.22
¼	.05½	.07½	.11	.22
⅜	.05½	.07½	.11	.22
½	.07	.09½	.14	.28
¾	.08½	.11½	.17	.34
1	.11¾	.16	.23½	.47
1¼	.15½	.22	.31	.62

From the above list the manufacturers announce a discount of 70 per cent. on Butt Welded Pipe, Black, and 64 per cent. discount on Butt Welded Pipe, Galvanized.

Wrought Iron Pipe, Lap Welded.

Diam. inches.	Black	Galv'd.	X strong.	XX strong.
1½	$0.26	$0.31	$0.52	$1.04
2	.35	.42	.70	1.40
2½	.52	.62	1.04	2.73
3	.68	.80	1.36	3.57
3½	.81	.96	1.62	4.25
4	.95	1.16	1.90	5.00
4½	1.25	1.50	2.50	6.56
5	1.42	1.75	2.84	7.45
6	1.85	2.20	3.70	9.25
7	2.45	3.00	4.90	12.25
8	2.95	3.70	5.90	14.75
9	3.75	....	....	.....
10	4.75	....	....	.....

Referring to the above list the association determined on the following discounts: On Black Lap Welded Pipe, 77 per cent.; on Galvanized Lap Welded Pipe, 68 per cent.

Standard Boiler Tubes.

Size O. D.	Price.	Size O. D.	Price.
1	$0.37	4½	$0.69
1¼	.35	5	.82
1½	.32	6	1.08
1¾	.32	7	1.33
2	.30	8	1.70
2¼	.32	9	2.25
2½	.36	10	2.76
2¾	.39	11	3.30
3	.39	12	3.77
3¼	.45	13	4.43
3½	.48	14	5.04
3¾	.55	15	5.87
4	.60	16	6.50

On sizes of Boiler Tubes from 1-inch to 2¼-inch a discount of 75 per cent. is announced, and on larger sizes from 2½ inch to 16-inch a discount of 77½ per cent.

Lap Welded Casing.

Nom. I. D.	Nom. O. D.	B.W. G.	Price.	Weight.	Threads.
2	2¼	13	$0.24	2.22	14
2¼	2½	12	.26	2.82	14
2½	2¾	12	.27	3.13	14
2¾	3	12	.29	3.45	14
3	3¼	11	.32	4.10	14
3¼	3½	11	.35	4.45	14
3½	3¾	11	.37	4.78	14
3¾	4	10	.43	5.56	14
4	4½	10	.46	6.00	14
4¼	4½	10	.50	6.36	14
4¼	4½	6	.67	9.38	14
4½	4¾	10	.52	6.73	14
4½	4¾	6½	.67	9.39	14
4¾	5	9	.58	7.80	14
5	5¼	9	.61	8.20	14
5	5¼	7	.71	9.86	14
5	5¼	4	.87	12.80	11½
5	5¼	1	1.06	15.88	11½
5 3/16	5½	9	.63	8.62	14
5 3/16	5½	5	.84	12.49	11½
5⅝	6	8	.73	10.46	14
5⅝	6	6½	.83	12.04	11½
5⅝	6	4½	.95	14.20	11½
5⅝	6	2½	1.13	16.70	11½
6¼	6⅝	8	.85	11.58	14
6¼	6⅝	6½	.97	13.52	11½ 14
6¼	6⅝	3½	1.18	17.02	11½
6⅝	7	8	.93	12 34	14
6⅝	7	4	1.27	17.51	11½ 10
7¼	7⅝	8	1.06	13.55	14
7⅝	8	7	1.22	15.41	11½
7⅝	8	4	1.53	20.17	11½
8¼	8⅝	7	1.25	16.07	11½
8¼	8⅝	5	1.56	20.10	11½
8¼	8⅝	2½	1.86	24.38	11½ 8
8⅝	9	7	1.51	17.60	11½
9⅝	10	6	1.80	21.90	11½
10⅝	11	5	2.13	26.72	11½
11⅝	12	4½	2.42	30.35	11½
12½	13	3½	2.95	33.78	11½
13½	14	2½	3.48	42 02	11½
14½	15	2	4.15	47.66	11½
15½	16	2	4.57	51.47	11½

The discounts relating to the above list as announced by the association are as follows:

	Per cent.
Screw and socket joint casing	65
Inserted joint casing	60

In connection with the foregoing it will be understood that additional discounts are allowed by the manufacturers to the large buyers and to the jobbing trade. It is stated by the manufacturers that a determined effort will be made to sustain the advanced prices. Manufacturers present at the meeting reported a considerably larger demand at present than is usual at this season, and the outlook for the future is regarded as very encouraging.

Lawn Mowers.—There are many indications that a large business will be done during the present season in Lawn Mowers. The market is, however, in a somewhat unsatisfactory condition. On the cheaper machines very low prices are being made, while on the better grades the market has a better tone. In view of the unprofitable prices prevailing on goods which are without recognized position some of the manufacturers have withdrawn from the market for the present, but with increased facilities on the part of their competitors and new concerns in the field the supply of machines is ample and competition active.

Philadelphia Lawn Sprinkler.—This Lawn Sprinkler was described in *The Metal Worker*, January 26, as manufactured by the Philladelphia Lawn Mower Company, Philadelphia. The Sprinkler is sold from the following list, which is subject to a discount of 33⅓ per cent., f.o.b. Philadelphia:

	Each.
No. 1	$1.00
No. 2	1.25
No. 3	2.00
No. 4, with turtle back	7.00

Columbian Enameled Steelware.—We are advised by the Bellaire Stamping Company, Harvey, Ill., that they have made a reduction in the price of their Columbian Enameled Steelware for the season of 1895.

Grip Wire Stretcher.— Grip Wire Stretcher, put on the market by W. C. Heller & Co., Montclair, N. J., is priced at $3 per dozen, subject to a discount of 50 per cent.

Glass.—Within the past week or two there has been a decrease in the American Window Glass productive capacity of the country equivalent to about 70 pots. This has been caused by factories going out of blast for repairs, and they are likely to remain idle for two or three weeks. The impression prevails that shut downs, ostensibly for repairs, will become more common, as orders are now pretty well filled and present prices offer little or no inducement for stocking Glass at factories. It is expected that the amount of Glass made will gradually decrease until prices and demand offer additional incentives to production. The New York market is represented by the following quotations: In small lots, 85 and 15 per cent. discount for single and 85 and 20 per cent. discount for double strength Glass. Further reports have come to hand regarding the new arrangement among the American Plate Glass manufacturers, to which reference was made in our issue of January 10, 1895, which indicate that the properties of the several Plate Glass companies will be sold to a corporation upon a basis of $10,000,000

Old Metals.—Business is only fair and prices are barely steady. The following quotations represent the current rates paid by dealers in this city:

Heavy Copper	℔ 7 ¢
Light and Tinned Copper	℔ 6½¢
Heavy Brass	℔ 4¾¢
Light Brass	℔ 3¾¢
Lead	℔ 2¾¢
Tea Lead	℔ 2½¢
Zinc	℔ 2⅛¢
No. 1 Pewter	℔ 10 ¢
No. 2 Pewter	℔ 5½¢
Wrought Scrap Iron, ℗ gross ton	$7.50 @ $8.00
Heavy Cast Scrap ℗ gross ton	7.50 @ 8.50
Stove Plate Scrap	℗ gross ton 5.00
Burnt Iron	℗ gross ton 3.00

Old Rags, Paper, &c.—Demand is fair and dealers' purchasing prices substantially the same as those quoted last week, namely:

No. 1 White Rags	℔	3	@ 3¼¢
No. 2 White Rags	℔	2¼	@ 2⅛¢
Mixed Rags	℔	¾	@ 1 ¢
Blues and 3ds	℔	1⅛	@ 1⅜¢
Hard Sized White Shavings	℔	2⅛	@ 2¼¢
No. 1 White Book Shavings	℔	1¾	@ 2⅛¢
No. 2 White Book Shavings	℔	1	@ 1⅛¢
Light Book Shavings	℔		⅝¢
No. 1 Mixed Shavings	℔	⅞	@ 1 ¢
No. 2 Mixed Shavings	℔	⅝	@ ¾¢
No. 1 Printed Books	℔	1	@ 1¼¢
Ordinary Mixed Books	℔	½	@ ¾¢
Newspapers	℔		2·5¢
No. 1 Manila Paper	℔	¾	@ 1 ¢
No 2 Manila Paper	℔	⅝	@ ¾¢
Bogus Paper	℔		½¢
Common Paper	℔	¼	@ 3·5¢
Straw Chips	℔		⅝¢
Binders' Clippings	℔		½¢
Jute Butts	℔	1½	@ 1¾¢
No. 1 Jute Bagging	℔	1	@ 1¼¢
Mixed Bagging	℔	¾	@ 1 ¢
No. 2 Bagging	℔	½	@ ¾¢
Hemp Twine	℔	2	@ 2¼¢
Manila Rope	℔	2	@ 2¼¢
Jute Rope	℔	1½	@ 1¾¢
Mixed Rope	℔	¾	@ ⅞¢

Old Rubber.—The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots, ℔ lb.	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@ .05¼
Rubber Shoes, less than carloads, ℔ lb.	@ .04¾
White Wringer Rolls, ℔ lb.	@ .03⅞
White Syringes, ℔ lb.	@ .03⅞

In a Special Notice on another page the John W. Ealy Company call particular attention to their "tracer," which is designed to give information to the subscriber as to the history, credit, standing, &c., of his customers, or those who are prospective customers. The success with which the "tracer" accomplishes this is emphasized. The company also state that in addition to the "tracer" report they are in a position to give all the benefits that any other mercantile agency can furnish, including a reference book of credits, semi-annually issued in January and July. This "blue book" contains a complete classified list of names, with the financial worth and pay ratings of merchants, manufacturers and dealers throughout the United States and Canada in Hardware, Stoves, Tinware, Plumbing and House Furnishing Goods.

Fire at A. Stevenson's Brass Works, 531 West street, New York City, caused heavy damage on February 7.

C. F. Evans, for many years with the C. W. Evans Company and latterly with the firm of Evans & Robertson, Cincinnati, Ohio, with associates, under the name of the C. F. Evans Steel & Iron Company, with office at 50 Carew Building, Cincinnati, have just completed arrangements whereby they will represent Iron and Steel and kindred productions in Cincinnati and the territory tributary thereto.

As a result of the conferences between President Wilson of the Board of Health of New York and Street-Cleaning Commissioner Waring, President Wilson announced that several amendments to sections 95 and 96 of the Sanitary Code would be acted upon by the board next week. It is thought that the proposed amendments will be adopted. All receptacles required by one section must comply with the following conditions, viz., to be of iron, either painted or galvanized; of cylindrical form, not more than 21 inches in diameter and 36 inches in hight, with two handles on the upper part, and metal cover; to have the name of the street and the number of the house marked in plain letters thereon; to be kept clean and inoffensive, and in good order, both inside and outside, when empty. The proposed amendments provide for a uniform receptacle, and eliminate the words "box, barrel and tub."

Eugene Kulinski & Co., 93 Thompson street, New York City, have just completed two wrought iron gates for the new City Hall, at Philadelphia, which are among the most massive and elaborate specimens of artistic hammered iron work ever produced in this country. The gates, which will stand in front of the Select and Common Council Halls of the Quaker City, are made from designs by W. B. Powell of Philadelphia. They are in the Renaissance style, light and graceful in appearance and profusely ornamented, yet strong and massive, each gate, with its immediate frame work, weighing 3 tons. The gates and adjuncts are each 18 feet wide and 15 feet high, and there is not a casting in the whole fabric. Every portion, to the minutest detail, has been hammered out of Swedish iron and American mild steel. The workmanship of the gates is exquisite, and they form a noteworthy addition to the beautiful examples of American art in iron which now adorn most of the great cities of the United States.

The receivers of the American Water Works Company, Omaha, Neb., have discovered that the plumbers in that city have been connecting houses with the water supply without informing the company, and claim that the company lost $1000 per month. Some of the plumbers have been cited to appear before the court to explain their action.

The first train passed, on February 1, through the new Belt Line tunnel of the Baltimore & Ohio Railroad in the city of Baltimore. The tunnel, which is 6 miles in length, was built at a cost to the railroad of $7,000,000. It has been in course of construction for four years. The company have contracted for electrically driven locomotives for taking trains through the tunnel, and it is expected that the new motors will be at work by April 1, after which no more steam engines will be permitted to enter the tunnel. It will be of value to the Baltimore & Ohio road, as obviating the ferrying of trains across the bay at Canton. Passenger trains between Washington and New York will by its means save from 20 to 30 minutes on their present schedule.

Gen. Austin Lathrop, Superintendent of State Prisons, in his annual report to the New York State Legislature for the fiscal year ended September 30, 1894, urges the pressing necessity of making some provision for the employment of convicts, who, under the new State constitution, are prohibited from working at any industry whereby they may come into competition with free labor.

The first ingot for the Russian armor plate contract was cast on Saturday at the Bethlehem Iron Company's works, under the eyes of the company's officials and the Russian inspector.

CONTENTS.

	Page.
Editorials:	
Hobbies	33
Their Good Influence	33
News and Notes	33
The Letter Box—	
Driven Wells	34
A Faulty Arrangement of Piping. Ill.	34
Size of a Gallon	34
Rusting of Gutter Outlets	35
Insufficient Air Supply	35
Estimating Labor in Pipe Fitting Contracts	35
Chimney Sweats	35
Barker's Chimney Top Ventilator	35
Roofing and Cornice—	
The Evolution of an Old Building. Ill.	36
Flashings	37
Heating and Plumbing—New Work and Contracts	37
The Retal-Store—	
Browne's Tea and Coffee Urn. Illus	38
The L. & H. Process Stove. Illus	38
Memoranda	38
The Art of Display	39
Reading Stove Dealers' Association	39
Steam and Hot Water—	
Heating from a Coil	40
Combination Heating.—III. Illus	40
Loss of Heat and Radiation. Illus	42
A Pipe Fitting Question. Illustrated	43
A Heating Problem	43
A Pompeiian Boiler. Illustrated	43
Fire Caused by Radiator	43
Heating Notes	44
Manufacturers' Prudential Expenses	44
Tin Plates—	
The Tin Plate Settlement	45
Scrap	45
Plumbing and Gas Fitting—	
Day Classes at the New York Trade School	46
Willimantic Master Plumbers	46
Chicago Master Plumbers	46, 49
A Live Wire and Plumbing	46
Municipal Cleansing and Public Health.	46
Connecticut State Plumbers	47
The Babette Seat. Illustrated	48
Apprenticeship	48
Traps and Vents	49
The Hale Basin Waste and Plug. Illus.	50
Dimensions of a Small Treadle Lathe	50
Stove Trade Notes—	
Ohio Stove Trade	51
Odd Plates	51
The Chicago Drainage Canal	52
The Manufacture of Tubular Articles. Illustrated	53
Trade Report—	
The Iron Market	54
Metal Market	54
Trade Notes	55
Condition of the Hardware Trade	55
Notes on Prices	55
Metal and Miscellaneous Prices	58
Labor Exchange—	
Help Wanted	60
Situations Wanted	60

Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 7, 1895.

Tin—

Straits pigs.....16½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX, 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 26.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade.	IC, 10 x 14	@ 5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX. 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—	IC. 10x14.14x20.	$4.75 @ 5.00
	IC, 14x20. 90 lb.	4.25 @ 4.50
	IC, 14x20. 100 lb.	4.50 @ 4.75
	10 x 20	@ 7.25
	20 x 28	@10.00
	IX, 10x14, 14 x 20	@ 6.25
N.Y. Grade.	IC,10x14, 14x20	@ ....

Charcoal Plates.—Terne.

Guaranteed Plates command specia prices, according to quality.

Mansel and Dean Grades.—	IC. 14 x 20	@$5.00
	20 x 28	$9.50@10.00
	IX. 20 x 28	12.00@12.50
Worcester Brand and equal.—	IC. 14 x 20	@ 5.25
	IC, 20 x 28	10.00 @10.50
	IX, 14 x 20	6.25 @ 6.50
	20 x 28	12.50 @13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56	....	$12.50
XX, 14 x 56	29.50	14.00
X, 14 x 60	....	13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.37½
IX, 10 x 14, 12 x 12, 14 x 20. 6.62½

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.62½
IX, 10 x 14, 12 x 12, 14 x 20. 7.12½

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.12½
IX, 10 x 14, 12 x 12, 14 x 20.. 7.62½

Usual extraf or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20.....$5.75
IX, full weight, 14 x 20..... 7.50

Irondale A A:

IC, full weight, 14 x 20..... 5.25
IX, full weight, 14 x 20..... 6.75

Irondale A:

IC, full weight, 14 x 20..... 5.00

Irondale B:

IC, 100 lbs., 14 x 20 ..... 4.75
IC, full weight, 14 x 20..... 4.85

Irondale C, IC, 14 x 20, 100 lbs..... 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates.—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $5.00
Old Hundred, IC, 14 x 20, 100 lbs.... 4.75
R. W. & B., IC, 20 x 28, 216 lbs.....10 00
Old Hundred, IC, 20 x 28, 200 lbs.... 9.50

Roofing Plates.

Palm, IC, 20 x 28.....@$10.00
Palm, IX, 20 x 28..... @ 12.00
Empire, IC, 20 x 28.....@ 10.75
Empire, IX, 20 x 28.....@ ....
Hickory, IC, 20 x 28.....@ 11.50
" IX, 20 x 28.....@ 14.00
Alaska (heavily coated), IC, 20x28 @ 13.50
Alaska IX, 20 x 28.....@ 16.50
Special, IC, 20 x 28.....@ 13.50
" IX, 20 x 28.....@ 16.50
Niagara, IC, 20 x 28..... 9.50
Iroquois, IC, 20 x 28..... 9.00

Westmoreland:

IC, 14 x 20..... 5.25
IC, 20 x 28..... 10.50

Kenwood:

IC, 20 x 28..... 10.00

Furmston:

IC, 14 x 20..... 4.75
IC, 20 x 28..... 9.50

Irondale AA, IC, 14 x 20.....
Irondale A, IC, 20 x 28..... 10.50
Irondale B, IC, 20 x 28..... 10.10
Each extra cross $1.50.

Challenge, IC, 20 x 28.....10.50

Jnno:

IC, 14 x 20.....
IC, 20 x 28.....

Illinois, Old Method:

IC. 20 x 28..... 13.50
IX, 20 x 28..... 16.50

E. L.:

IC, 20 x 28..... 10.75
IX, 20 x 28..... 13.25

Jessie:

IC, 20 x 28..... 10.25

Old Process:

IC, 14 x 20..... 8.00
IX, 14 x 20..... 9.50
IC, 20 x 28.....16.00
IX, 20 x 28.....19.00

H. B. L., Old Style:

IC, 14 x 20..... 7.00
IX, 14 x 20..... 8.25
IC, 20 x 28.....14.00
IX, 20 x 28.....16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.65

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 1-10¢	2 8-10¢
17 to 20	₩ lb 2 2-10¢	2 9-10¢
21 to 24	₩ lb 2 3-10¢	3 ¢
25 and 26	₩ lb 2 4-10¢	3 1-10¢
27	₩ lb 2 5-10¢	3 2-10¢

Russia, Planished, &c.

	100 lbs.
Patent Planished, ₩ lb, A	$10.20 } 10%
Patent Planished, ₩ lb. B	9.20 } dis
Craig's Polished Sheet Steel	8¼¢

Galvanized.

Juniata, or first quality.....dis.75&10%

Copper—

Ingot.

Lake.....11 ¢@ 11½¢
Casting Brands.....10 ¢@ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, 5/8 inch up to ¾ inch	.36
Plain, ½ inch up to 5/8 inch	.38
Plain, 3/8 inch up to ½ inch	.41
Plain, 5-16 inch up to 3/8 inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, 1/8 inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than 1/8 inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 lb casks.....$4.75
300 lb casks,.....4.95
Loose sheets.....5.05

Solder—

½&¼..... 9¾@10¢
Extra Wiping.....8½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9½¢

Lead—

Soft Pig Lead.....3½¢
Bar.....4¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe—

1¼ and under, Plain.....57½&10&10%
1¼ and under, Galv .....50&10&10%
1½ and over, Plain.....67½&10&10%
1½ and over, Galv.....57½&10%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....57½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd.....65%
Ritchie's Spiral Lock Seam, Galv'd....60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....65%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....₩ lb, 2 ¢
" " Brown.....₩ lb, 1½¢
" " Purple.....₩ lb, 2½¢
" Ground in oil, B. Red ₩ lb, 6½¢
" Ground in oil, Red.. ₩ lb, 6½¢
" Ground in oil, Brown ₩ lb, 5½¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls.....60¢
Linseed Oil, Raw, in bbls .....58¢
Mineral Paints.....2@4¢
Orange Mineral.....8¢
Pure White Lead in Oil.....5½@5¾¢
Dry White Lead in bbls.....4¾@5½¢
Red Lead, American.....5½@5¾¢
Red Venetian, English, dry .....1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs.....7½¢
Sipe's Japan Oil, in bbls. ₩ gal..... 34¢
Spirits Turpentine, in bbls., ₩ gal. 35½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.50
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.15
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.50
Roofing Pitch, lb bbl. of 300 lb.....$3.00

NEW YORK, FEBRUARY 8, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Ainminum (gnaranteed over 98% pure), in rolling ingots
Small lots.....₩ lb, 63¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ lb, 60¢
100-lb lots..:.....₩ lb, 55¢
Ton lots.....₩ lb, 53¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ lb, 55¢
100-lb lots.....₩ lb, 53¢
Ton lots.....₩ lb, 50¢

Antimony—

Cookson.....₩ lb, 9¼@9½¢
Hallett's.....₩ lb, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.	
¼-in. up to 2-in.	$0.35	25 @ 30%
5/16-in. up to ¾-in.	.36	
⅜-in. up to 5/8-in.	.38	
7/16-in. up to ½-in.	.41	
5-16-in. up to 3/8-in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
1/8-in. up to 3-16-in.	1.50	
Smaller than 1/8-in.	Special	
3 in. and larger.	Special	
2 in. to 3 in., to No. 19, inclusive,	.38	

Cooper and Bronze Tubing—

8¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized.....60&10%
Galvanized, Locked Joints.....60&10%
Tin.....60&10%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₩ lb, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....9¾¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:

Lap or Slip Joint, Galvanized.....70&5%
Lap or Slip Joint, Terne.....60&5%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb 2.25	2.60¢
Nos. 17 to 21	₩ lb. 2.35	2.70¢
Nos. 22 to 24	₩ lb, 2.45	2.80¢
Nos. 25 and 26	₩ lb. 2.55	2.90¢
No. 27	₩ lb. 2.65	3.00¢
No. 28	₩ lb, 2.75	3.10¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11@11½¢
Patent Planished....₩ lb, A, 10¢: B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16	75&5@75&10% off.	
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig.....3½@3¾¢
Bar.....4@4½¢
Pipe.....5¼¢ 20%
Tin Lined Pipe.....12½¢ 20%
Block Tin Pipe.....30¢ 20%
Sheet.....6¼¢, 20%
Old Lead in exchange, 2¾¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....30%
Netting, Painted Sheets.....30%
Door Mats, Galvanized.....30%
Window Guards, Paneled.....15%
Tree Gnards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100 @ 500 lb		5¾¢
Lead, Amn. White, in oil	@	5½¢
Lead, Red, bbls. and ½ bbls.	@	5¾¢
Lead, Red, kegs	@	5¾¢
Ocher, American	@	1½¢
Red Venetian, American	@	1¾¢
Linseed Oil:		
Raw, ₩ gal	@	.56
Boiled	@	.59
Spirits Turpentine:		
In bbls	@	.30
Putty:		
In barrels and ½ bbls	@	.01¾ .01¾
In tubs	@	.01¾ .01¾
In tin cans	@	.01¾ .02¼
In bladders	@	.01¾ .02¼
Roofing Material, &c.:		
Asphaltum, Trinidad Refined, ₩ ton		$30.00@$35.00
Asphaltum, Rock, ₩ ton		$14.00
Coal Tar Felt, 1 Ply, ₩ lb		2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.		$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.		$1.85
Roofing Pitch ₩ bbl.		$2.25

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe," " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—
Galvanized.....60%
Tin.....60%

Rock and Slag Wool—
	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	2½	33½¢
Rock Wool, ordinary	2½	27¢
Rock Wool, extra	7½	43½¢

Rosin—
Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.44@$1.45
Rosin, E. & F.....₩ bbl. $1.50@$1.55
Rosin, G. & H.....₩ bbl. $1.65@$1.95
Rosin, I. & K.....₩ bbl $2.30@$2.50
Rosin, M. & N.....₩ bbl $2.80@$6.00

Seamless Brass Tubes..net
List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—
According to size, f.o.b. cars, Quarry Station.
Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.70@ 4.00
Peach Bottom, ₩ sqr.....4.75@ 5.00
No. 1 Chapman, ₩ sqr.....3.90@ 4.25
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.50@ 2.75
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—
Solder—
½&½, guaranteed.....11¢
No. 1.....9@9½¢
Prices of Solder indicated by private rands vary according to composition.

Soldering Fluids—
Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....3½¢ } 5 qls.
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢
Yager's Soldering Salts.
½-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—
Western Spelter.....4¢@4¼¢
Bertha (pure).....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers. Conductor—
Galvanized.....60%

Tin, Pigs and Bars—
Banca, pigs, ₩ ℔.....16¢
Straits, pigs, ₩ ℔.....15¢
Straits in bars, ₩ ℔.....16¢

Tin Plates—
American Terne Plates—
Alaska (re-squared) IC, 14 x 20....$6.50
Alderly, extra quality, IC, 14 x 20..5.87½
Allegheny, IC, 14 x 20.....4.50
" IX, 14 x 20.....5.75
Anchor IC, 14 x 20.....4.12½
Apollo Roofing, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Black Diamond (Extra Coated), IC, 14 x 20.....7.50
Bonus (Extra Coated), IC, 20 x 28..11.50
" " " IX, 20 x 28..14.50
Boston, IC, 14 x 20.....6.25
Brooklyn, IC, 14 x 20.....4.50
Capitol, IC, 14 x 20.....4.25
Central, IC, 14 x 20.....4.75
Climax, IC, 14 x 20.....4.37½
Columbia, IC, 14 x 20.....6.25
Columbus, IC, 14 x 20.....4.75
Dunlap's Double Dipped, IC, 14 x 20 7.50
" " " IX, 14 x 20 8.75
" Domestic, IC, 20 x 28.....10.00
Empire, IC, 14 x 20.....5.12½
Eureka, IC, 20 x 28.....9.50
" IX, 20 x 28.....12.00
Eureka, 200 lbs., IC, 20 x 28.....9.20
Excelsior, IC, 14 x 20.....4.75
Filbert, IC, 14 x 20.....7.25
Flag, IC, 14 x 20.....4.00
Florida, IC, 14 x 20.....4.75
Flushing, IC, 14 x 20.....6 25
Freeport (Hand dipped and Resquared). IC, 14 x 20.....6.50
IX, 14 x 20.....7.75
F. R. P., Extra, IC, 20 x 28.....15.00
Globe, IC, 14 x 20.....4.50
Golden Star Old Style, IC, 20 x 28...15.00
" " " IX, 20 x 28...18.00
Grace, IC, 14 x 20.....4.25
Hamilton's Best Redipped, IC, 14x20 7.75
" " " IX, 14x20 9.25
Hickory (Resquared), IC, 14 x 20...5.50
J. L. O., IC, 20 x 28.....9.25
Juniati, IC, 20 x 28.....11.50
Juno, IC, 14 x 20.....5.50
Kensington, IC, 14 x 20.....6.75
" IX, 14 x 20.....8.00
Knoxall, IC, 14 x 20.....4.75
Laufman's Apollo (Resquared), IC, 14 x 20.....6.75
Laufman's Apollo (Resquared), IX, 14 x 20.....8.25
Leominster, Extra Coated, IC, 14x20...5.75
Lion (Stamped), IC, 14 x 20.....5.75
Lulu, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.50
Maple, IC, 14 x 20.....5.75
Merchant's Roofing (Resquared), IC, 14 x 20.....7.50
Meurer's Old Method, IC, 14 x 20.....7.50
Meurer Roofing, IC, 14 x 20.....7.00
National, IC, 14 x 20.....5.50
Nava, IC, 20 x 28.....10.00
" IX, 20 x 28.....12.50
New Castle Old Method, IC, 20x28, 18.00
New Castle Palm, IC, 20x28.....14.50
Old Colony, IC, 14 x 20.....7.50
Osborn's Old Process, IC, 20 x 28....14.00
" " " IX, 20 x 28....17.00
Osceola, Old Style, IC, 14 x 20.....7.25
" " IX, 14 x 20.....8.75
Pennsyl Old Method (Treble Coated), IC, 14 x 20.....7.00
Phillips' Roofing, IC, 14 x 20.....7.00
Phœnix, IC, 14 x 20.....4.62½
Pullman, IC, 14 x 20.....5.75
Republic, IC, 14 x 20.....4.75
Scott's Extra Coated (Resquared), IC, 14 x 20.....8.00
Scott's Extra Coated (Resquared), IX, 14 x 20.....9.50
Standard, IC, 14 x 20.....4.15
Star, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.00
Superior, IC, 14 x 20.....4.50
Taylor's Old Method, IC, 14 x 50....6.50
Taylor Old Style (Resquared), IC, 14 x 20.....7.50
Taylor Roofing, IC, 14 x 20.....6.75
The Osborn Roofing, IC, 20 x 28.....11.50
" " " IX, 20 x 28.....14.00
Thomson's Puritan, IC, 14 x 20.....5.50
Tip Top, IC (Resquared), 14 x 20....4.88
" IX " 14 x 20....6.13
Triumph, Old Style, IC, 14 x 20.....7.50
" " IX, 14 x 20.....9.00
U. S. Monongahela, IC, 14 x 20.....6.10
U. S. Redipped, IC, 14 x 20.....8.25
Venus, IC, 14 x 20.....4.12½
Waldo, IC, 14 x 20.....5.75
Westmoreland, IC, 14 x 20.....6.25
Willow, IC, 14 x 20.....5.25
Zero, IC, 14 x 20.....4.50

American Bright Plates—
Almond, IC, 14 x 20.....$5.25
Brilliant (Tissue Packed), IC, 14x20. 8.00
Brooklyn, IC, 14 x 20.....5.50
Century, IC, 14 x 20.....5.00
Climax, IC, 14 x 20.....4.75
Excelsior, IC, 14 x 20.....6.50
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....5.50
Florida, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Gladys, IC, 14 x 20.....4.50
Hazel, IC, 14x20.....5.80
Ivy, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Linden, IC, 14x20.....5.50
Mars, IC, 14 x 20.....4.50
" IX, 14 x 20.....5.50
Merchant's Dipped, IC, 14x20.....10.00
Merlon, IC, 14x20.....6.00
Mint, IC, 14x20.....5.00
New Castle Best Palm Charcoal, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
New Castle Palm Charcoal, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.00
New Castle, Charcoal, IC, 14 x 20... 6 25
" " IX, 14 x 20... 7.50
New Castle, S. Charcoal, IC, 14 x 20. 6.00
" " IX, 14 x 20. 7.25
New Castle Palm Coke, IC, 14 x 20.. 5.75
" " IX, 14 x 20.. 6.85
New Castle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Oak, IC, 14 x 20.....4.75
Palma, IC, 14x20.....6.00
Pansy, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.00
Phœnix, IC, 14x20.....5.25
" IX, 14x20.....6.50
Royal, IC, 14x20.....6.25
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Walnut, IC, 14 x 20.....4.65
Youghiogheny, IC, 14 x 20.....6.00

Imported Terne Plates—
Charcoal.
MF Grade, IC, x 20.....$6.2
x 28.....12.5
Pontymister Old Style Grade, IC, 14 x 20.....5.50
" " 20 x 28.....11.00
" IX, 14 x 20.....6.50
" " 20 x 28.....13.00
Worcester Grade, IC, 14 x 20.....4.50
" 20 x 28.....9.00
" IX, 14 x 20.....5 75
" 20 x 28.....11.50
Dean Grade.—IC, 14 x 20.....4.25
" 20 x 28.....8.50
" IX, 14 x 20.....5.50
" 20 x 28.....11.00
Abercarne Grade.—IC, 14 x 20.....4.00
" 20 x 28.....8.00
" IX, 14 x 20.....5.50
" 20 x 28.....11.00
Mansel Grade, IC, 20 x 28.....8.00

Imported Bright Plates—
Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Caerland Grade. IC, 10 x 14.....$5.25
" " IC, 12 x 12.....5.50
" " IC, 14 x 20.....5.25
" " IC, 20 x 28.....10.50
" " IX, 10 x 14.....6.50
" " IX, 12 x 12.....7.00
" " IX, 14 x 20.....6.50
" " IX, 20 x 28.....13.00
" " DC, 12½ x 17.....5.00
" " DX, 12½ x 17.....6.50
Allaway Grade. IC, 10 x 14.....4.75
" " IC, 12 x 12.....5.00
" " IC, 14 x 20.....4 75
" " IC, 20 x 28.....9.50
" " IX, 10 x 14.....5.50
" " IX, 12 x 12.....5.75
" " IX, 14 x 20.....5.50
" " IX, 20 x 28.....1.00
" " DC, 12½ x 17.....4.25
" " DX, 12½ x 17.....5.00
Coke.
Steel Coke.—IC, 10x14, 14x20.....4.25
" 10x20.....6.50
" 20x28.....8.50
" IX, 10x14, 14x20.....5.25
B. V. Grade.—IC, 10x14, 14x20.....4.25

Imported Boiler Plates.—
IXX, 14x26..(112 sheets).....$11.50
IXX, 14x28..(112 sheets).....11.90
IXX, 14x81..(112 sheets).....13.25

Tinning—
Brass and Copper.....

Tubing—
Tin.....55%
Galvanized.....55%

Brass and Copper.—
Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—
Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—
List Feb. 1, 1895.
1¼ and under, Plain.....70%
1¼ and under, Galv.....64%
1½ and over, Plain.....77%
1½ and over, Galv.....68%
Boiler Tubes.....75@77½%
Screw and Socket Joint Casing.....65%
Inserted Joints Casing.....60%

Zinc—
600 ℔ casks.....₩ ℔ 4¾¢
Per ℔.....5¼¢

It Is Reported—
Minnesota.
That Joseph and John D. Bricher have purchased their brother's stock of Hardware, &c., at KELLOGG. They will continue the business under the name of Bricher Bros.

That J. B. Mack & Co. are successors to F. M. Spalding in the Hardware business at MINNEAPOLIS.

Hoovel & Iverson are successors to H. G. Anderson in the Hardware business at JACKSON.

Missouri.
That Carl W. Shearer has bought the interest of his father, D. E. Shearer, in the Hardware business at MILAN.

Nebraska.
That D. Waite's Hardware store, at PALMYRA, was burglarized recently and a lot of cutlery carried off.

New York.
That the Hardware firm of Wright, Dana & Co., UTICA, have been incorporated with a capital stock of $50,000.

That D. Crocker of AFTON has sold his stock of Hardware, Stoves and Implements to C. J. Fuller of the same place. Mr. Fuller will take possession February 1, after which time he will add considerably to the stock.

That the Hardware firm of Sponenberg & Waddingham, WATERTOWN, was dissolved on the 15th inst. H. M. Sponenberg, having purchased the entire stock and good will of the business, will continue it at the old stand.

That J. H. Ellenbaum, Hardware merchant, NIAGARA FALLS, has commenced the erection of a three-story brick block, a part of which he will occupy on completion.

That J. C. Myers has retired from the Hardware business at LYONS. Chss. A. Noble is his successor.

That Mr. O'Neil has purchesed a half interest in the Hardware store of Daniel McWilliams, EAST BLOOMFIELD.

That the Hardware firm of McMillan & Johnston, KINGSTON, have dissolved, Mr. McMillan retiring. The business will be continued by Mr. Johnston, who will have S. D. Coykendall as a special partner.

That Murphy Bros. are making radical changes in their Hardware and grocery store at PH NIX.

Ohio.
That the Heldinyer Hardware Company, ELYRIA, have been incorporated. The capital stock is $20,000.

That J. F. Cover, Hardware merchant, OTTAWA, has disposed of a half interest in his business to W. S. P. Gill, the firm style becoming Cover & Gill.

That E. M. Frederick, Hardware merchant of JOHNSTOWN, has just completed a new storeroom, 38 x 80 feet, with 16-foot ceiling. The main room is 28 x 80 feet in dimensions, shelved to the ceiling and fitted with F. E. Myers & Bros.' Store Step Ladders. The storeroom is 10 x 68 feet and the office 10 x 12 fect. Mr. Frederick took possession of the new store on the 21st inst.

That the Krautz Hardware Company, LORAIN, were recently incorporated. The capital is $20,000.

That on the 15th inst. the Hardware establishment of J. M. Kerr & Co., GALLIPOLIS, was burglarizcd.

That Hugh J. Frascr has purchased J. C. Taggart's interest in the Hardware and Drug firm of Fraser & Taggart, EAST PALESTINE.

Pennsylvania.
That William Kimball has purchased the Hardware business of the late Jacob Schieffelin, TIOGA.

That Merrill Douglass has purchased the Stove and Tinsmith business of his father, the late Thomas G. B. Douglass, BRISTOL, and will take active charge of it April 1.

That G. S. Eaby & Son have disposed of their Tin and Sheet Iron business, at ALTOONA, to Albert A. Johnson.

That F. E. Gale & Bro., SHINGLE HOUSE, have removed their stock of Hardware to GENESEE FORKS.

That S. L. Robb has taken possession of his new Hardware store at JAMESTOWN.

That J. A. Gleen has sold his Hardware store at NEW WILMINGTON to Barnes Bros.

South Carolina.
That a new Hardware store has recently been opened at AIKEN by C. R. Allen & Co; they will also do a plumbing business.

South Dakota.
That F. H. Treat, formerly of the firm of Ferguson & Treat, lumber dealers, CANTON, is now the proprietor of a Hardware store in that place, having recently commenced business in that line.

Vermont.
That C. C. Whitten of the firm of Whitten & Temple, W. RANDOLPH, has purchased his partner's interest in the business.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A SALESMAN to travel the territory of Michigan and Ohio and a portion of Pennsylvania; must have experience as traveling salesman and be competent to design steam and water heating apparatus and sell the goods; give reference and salary required and state experience. "Territory," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 9

One good all round TIN, GALVANIZED IRON CORNICE and SLATE WORKER; steady work; good wages; must work on trial. Address "E. J.," 68 West Main street, Lexington, Ky. Feb. 9

Competent RETINNER for black and tinned work; state experience and wages expected. The Chicago Stamping Company, Chicago, Ill. Feb. 9

A practical PLUMBER and GASFITTER; one capable of estimating from plans and specifications, can secure a good interest in an old established firm; married man preferred. "Hardware," 130 West Fulton street, Grand Rapids, Mich. Feb. 9

By Eastern representative, a SALESMAN acquainted with wholesale hardware and rubber goods trade in New York City to sell specialties on commission. "A. H. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 9

SALESMAN in every State to sell as side line our steel roofing, corrugated iron, conductor, eave trough, &c.; product of a large concern. "Rare Chance," office of *The Metal Worker*. 96-102 Reade street, New York City. Feb. 9

A thoroughly competent galvanized iron cornice worker who understands drawings and is not afraid to work, as ASSISTANT FOREMAN in shop; a young man with ambition and modern ideas preferred; must be sober. "X.," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. Feb. 2

A good all round man who understands plumbing, tin work and general job work, pipe work, &c.; must be strictly temperate and reliable; steady job for right man; state age, experience, married or single and wages expected. Wilkinson & Watson, Oberlin, Ohio. Feb. 2

A practical TINNER capable of doing country tinning and plumbing; in country town with water system; give age and experience, married or single and wages wanted. Box 32, Newport, Perry County, Pa. Feb. 2

A first-class SALESMAN for the Eastern portion of the State of Pennsylvania; one who has traveled in that territory, and has an extensive acquaintance with the trade, and understands stamped, pieced and japanned ware, metal goods, tinmen's supplies and house furnishing hardware. "S. S. & Co.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

A FOREMAN for boiler shop; must be a first-class and experienced mechanic; able to calculate costs, make accurate estimates and build work cheaply; do not apply unless strictly sober, industrious and in good health. "Boiler Maker," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

A good boy, between the age of 16 and 18 years, to learn the tinsmith and plumbing trade; one who uses profane language need not apply; a good home for a good boy; terms, $30 per year with board and washing; must serve three years. A. M. Kreider, Lititz, Pa. Feb. 2

At Cleveland, Ohio, FOREMAN for small machine shop working on repair work; applicant must have practical experience, with a fair education. Address in own handwriting, stating age, experience, education and wages expected, "Foreman," care of E. S. Adams, 312 The Cuyahoga, Cleveland, Ohio. Feb. 2

By manufacturer, A1 TRAVELING SALESMEN visiting the stove and housefurnishing trade to sell our gasoline stove specialty on commission; big seller; state territory traveled. "Gasoline Stoves," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 2

SITUATIONS WANTED.

By a first-class CORNICE, SKYLIGHT and JOB WORKER, CUTTER and DRAFTSMAN; can estimate from plans, take charge of any number of men and handle to the best advantage. "Cornice Cutter," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 9

By a TINSMITH who thoroughly understands hot water heating, furnace and range work; fair knowledge of plumbing; German; married; steady position wanted. "William," care A. Maas, 339 East Twenty-second street, New York City. Feb. 9

By a reliable TINSMITH who is a good roofer and general outside workman; references if desired. James T. Cranston, 42 Anson street, Derby, Conn. Feb. 9

As CUTTER or FOREMAN in a cornice shop; first class draftsman; capable at all branches of the business; 20 years' experience. A. Johnson, 543 East Thirteenth street, New York City. Feb. 9

By a TIN, COPPER and SHEET IRON WORKER; 20 years' experience at all branches of the trade; first-class jobber and bench worker; expert on furnace work; reasonable wages. E. Harriott, 556 West 126th street, New York City. Feb 9

By a METAL PATTERN MAKER in or near New York; 10 years' experience. D. McCance, 186 Summer avenue, Newark, N. J. Feb. 9

A man 29 years of age would like to engage with a firm doing a large manufacturing business who require the service of a careful mechanic with a practical knowledge of machinery; also ability to design machines for special work, make drawings, &c.; strictly temperate, industrious and reliable; will engage for the first year at $2.50 per day. "J. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 9

Steady job wanted by a first-class PLUMBER in city or country; wages moderate. John Pratt, 630 Third avenue, New York City. Feb. 9

Steady employment desired by a first-class PLUMBER in city or country. Conrad Smallen, 64 West 101st street, New York City. Feb. 9

By a young man, as PLUMBER and GASFITTER; wages moderate; city or country. O. D. Burt, West Berkshire, Vt. Feb. 9

By a first-class tinner, as FOREMAN; understands steam and hot water heating and plumbing; first-class references. E. E. Dugroat, 10 Elm street, Morristown, N. J. Feb. 9

By a young man with three years' experience at the plumbing trade; can wipe a good joint; would like a steady job. Edward Kiernan, Wood avenue, above North, Bridgeport, Conn. Feb. 9

Steady job by a young man as TINNER; six years at outside work. "Tinner," 160 Middle street, Bridgeport, Conn. Feb. 9

Steady job wanted by a young man as TINSMITH; inside work preferred; wages moderate. Thomas Wall, 200 Navy street, Brooklyn, N. Y. Feb. 9

By a young married man as TINSMITH; nine years' experience at city and country work. Fred Waxman, 1521 Avenue A, New York City. Feb. 9

By a young man, 24 years old, as TINNER; can clerk in hardware store; strictly temperate and honest; best of references furnished; job preferred in country town in Pennsylvania or Ohio. Rush B. Miller, Fulton, Mich. Feb. 9

As SALESMAN on the road or CLERK in store; nine years' experience in stove, range, and tin store. "Tinner," Danville, Ky. Feb. 9

COMMISSION SALESMEN wanted on side line; goods sell from small samples and illustrated catalogue, mainly to hardware, housefurnishing, crockery, dry goods and bazar trades; state territory. "Staple Goods," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 9

A gentleman who has had about seven years' experience in the stove, range, tin roofing and furnace business desires a position as TRAVELING SALESMAN for some house; will satisfy as far as energy and push go. "W. H.," care Box 566, Lexington, Ky. Feb. 9

As PLUMBER; strictly sober, neat and quick workman wants work in city or country; 20 years at trade; understands plans thoroughly; can guarantee first-class work done; best of references. Edward Moran, 181 East 111th street, New York City. Feb. 9

By a young man, 20 years of age, who has had three years' experience at plumbing; can do a good job; not afraid of work; good reference. T. Breslaine, Rondout, N. Y. Feb. 9

As a SALESMAN, for steam and hot water boilers; well acquainted with the trade in New York State and Connecticut; formerly with the United States Heater Company and Detroit Heating & Lighting Company, both of Detroit, Mich.; best of references; or would accept a position to take charge of forge shop. Frank Shay, Pine Plains, N. Y. Feb. 9

By a PLUMBER; 12 years' experience; first-class steady workman; 28 years of age; position preferred in the South or West. J. McGee, 194 Mallory avenue, Jersey City, N. J. Feb. 9

A good TINSMITH with eight years' experience wishes steady work; can do all kinds of stove repairs, roofing, spouting, and steam and hot water radiator work. O. W. George, Girard Manor, Schuylkill County, Pa. Feb. 9

By young man, 14 years in shelf and heavy hardware; understands stoves and plumbers' goods; willing to make himself useful in shop; A1 references and strictly temperate; good bookkeeper. "J. R. B.," Alexandria, Ind. Feb. 9

By a young man with three years' experience and a graduate from the Master Builders' Exchange Trade Schools, at plumbing and gas fitting; would like to finish out his time; can wipe a fair joint of the various kinds; am thoroughly conversant with drainage; understand brazing and soldering in all its branches; Can furnish first-class reference; willing to go anywhere. S. E. Draves, 1032 Fernon street, Philadelphia, Pa. Feb. 9

By a TINSMITH and GENERAL JOBBER; order work a specialty; roofing, guttering, spouting, heater work and tinware; eight years' experience in one shop; employer about to sell out; willing to go to any city or country town in the United States or Canada. Chas. B. Garrison, Lock Box 222, Bridgeton, N. J. Feb. 9

By a practical experienced TIN and SHEET IRON WORKER; 25 years' experience at cornice and skylight work; can work from details and estima e from plans; capable of taking charge of shop; can also do dairy and blow pipe work. "W. C. B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 9

By a TINNER, with eight years' experience, at all branches of tin and furnace work; best of references; strictly sober and steady. F. P. Meade, 624 West High street, Lima, Ohio. Feb. 9

By first-class plumber, as FOREMAN of some shop; country preferred; can estimate on all kinds of work and can handle men to good advantage; expert on all kinds of pump work, also steam and gas fitting; would like to correspond with some good firm wanting such a man. "R. P. F.," 706 Fourth street, Marietta, Ohio. Feb. 2

By a PLUMBER, in city or country. W. Chandler, 277 West 127th street, New York City. Feb. 2

Steady job, by a PLUMBER and GAS FITTER; willing to do anything; sober and reliable; wages moderate. H. W. Bauer, P. O. Box 55, Wakefield, N. Y. Feb. 2

By a practical man of 12 years' experience as FOUNDRY FOREMAN on stove plate, bench or heater work; thoroughly posted on iron and iron mixtures; strictly temperate; can furnish first-class references. "S. P.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 2

By a first-class TIN, BRASS, COPPER and SHEET IRON WORKER; 20 years' experience; references; steady job desired, city or country. B. Maurer, 63 Lewis street, New York City. Feb. 2

A TIN PLATE SALESMAN who has had 15 years' experience, having been in the employ of two prominent tin plate firms, both as salesman on the road and five years as manager of a Chicago branch, desires to make arrangements with a Pittsburgh or Western tin plate mill to represent them in Chicago and large adjacent cities, he having sold this trade in the past. "Tin Plate," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 2

As FOREMAN or STEEL MAKER; age 40 years; have had 25 years' experience as foreman and molder in steel and iron foundry; can make all grades of crucible steel castings, warranted perfectly sound, soft and smooth, need no annealing; or will sell mixtures, facings and plan of furnaces, so that any brass or iron foundry at a small outlay can make their own steel castings; castings made one day can be used the next; for A1 reference and samples of steel, address "Steel," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 2

By a practical PLUMBER and GENERAL JOBBER, in city or country; steady, honest and sober; willing to work cheap. J. D. Abrams, Box 75, Hempstead, N. Y. Feb. 2

A thorough business man, who has had years of experience in all that pertains to the management of a manufacturing and mercantile business, desires a position as representative of a large manufacturing establishment as SALES AGENT or MANAGER of branch house. "W. J. A.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia. Feb. 2

By a TINSMITH of over 25 years' experience at furnace, iron pipe and general job work; understands tin assortment work; competent to take work and figure from specifications; references furnished. P. O. Box 489, Brockport, N. Y. Feb. 2

Special Notices.

NOTICE.

It has come to my knowledge that certain parties are offering an exact duplicate of our Phillips-Newbold Tinning Machine, including our Flue arrangements, both of which are protected by patents, and hereby give notice that any user of such Pots and Machines will be held responsible for damages, without reference to the builders thereot.

I have this month sold nine of our Phillips-Newbold Machines to run on special work where other pots are being run on such work as they are adapted for

(Signed) F. R. PHILLIPS,
Philadelphia, Pa.

FOR SALE.

Patent Steel Roofing, with the necessary tools for applying, electros for advertising, &c. Trade established. Good opportunity now open. Reasons can be given on spplication. Address

"COLUMBIA,"

office of *The Metal Worker*, 96 102 Reade Street, New York.

FOR SALE.

1 No. 2 American Giant Dynamo.
1 No. 3 Cupola Blower.

ENTERPRISE STOVE CO.,
Vincennes, Ind.

FOR SALE.

No. 7 Sturtevant Blower, only short time in use. Address

EUGENE MUNSELL & CO.,
218 Water St., New York.

FOR SALE.

In a growing town in Central Massachusetts, a Stove, Tin, Plumbing and Heating business. Water works just being introduced in the town. Capital required $1500. Address "B. E. L.," office of *The Metal Worker*, 96-102 Reade St., New York.

WANTED,

tenders to furnish one hundred thousand nipples, two inches outside diameter, one-sixteenth inch thick, one and one-quarter inches long, wrought iron or steel. Address

"H. H. H.,"

office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo.

WANTED.

Bsse Burner line of Hard Coal Stoves, by a stove manufacturer whose representatives cover the States of Michigan, Wisconsin, Indiana, Illinois, Missouri, Iowa and Western Ohio. Manufacturers having a line of this kind and wishing their goods sold through a manufacturer may send catalogue of their 1895 stoves. Address "STOVE MANUFACTURER," office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, O.

AN OLD ESTABLISHED Stove, Tin and House Furnishing business with good job bing trade Plumbing, Roofing and Furnace Work. Located on one of the best avenues in New York City, with full set of Plumbers' and Tinners' Tools and Machines, also horse and wagon, with privilege of doing business under owner's name. Good reason for selling. Business established 40 years. Address

"ESTABLISHED,"

office of *The Metal Worker*, 96-102 Reade St., New York.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

Special Notices.

FOR SALE.

A paying Hardware, Stove and Tinware business finely located in New England. Stock comprises a full line of Hardware, Paints, Oils, Tinware and Woodenware Have good trade in Steam Fitting, Plumbing, Tin and Sheet Iron work. Exceptional inducements will be offered to right man. Address

"EXCEPTIONAL"

office of *The Metal Worker*, 96-102 Reade St., New York.

FACTORY FOR SALE AT WHITESTONE, L. I. (30 minutes from New York). With boilers, 15 H. P. engine, machinery, tools, etc. Price, $5000: terms, $2000 cash, balance on mortgage. L. I. Railroad and Sound boats afford cheap freights. Very advantageous for light manufacturing, such as metal work, novelties, hardware, etc. Lot 50x100 facing on two thoroughfares, three-story brick building, 30x90, in excellent condition, with boiler and engine annex building. Address "FACTORY," P. O. Box 2718, New York City.

WANTED

for 1895, Side Lines, to handle on commission. Must give territory.

HANSELL & BELSON,
144 North 2d St., Philadelphia.

FOR SALE.

A No. 8 Sturtevant Blower, Countershaft and Pulley complete. This blower has been melting from 10 to 12 tons of iron per hour. Address

SCANLAN & CO.,
Louisville, Ky.

FOR SALE.

The leading stove store in a growing manufacturing city of 20,000, near New York. This is an old, and the best business stand in the city. Large store and moderate rent. We do Steam and Hot Water and Hot Air Heating, Plumbing and Tinning. This is a good investment, but present owner has too much other business to see to. Can inventory down to $3000. Address "A. A.," No. 119. office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

$2000

will buy a full stock of Stoves and House Furnishing Goods with complete sets of Plumbers' and Tinners' Tools, also good stock of Iron Pipe, Fittings, &c. Location the best. Town good. Stock can be reduced some if desired. Purchaser has control of entire Plumbing trade. Best reasons for selling. Business was established in 1865. Address "RETIRED," office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE or TO LEASE.

An established Plumbing and House Furnishing business at Narragansett Pier, R. I. Inquire of W. H. GRIFFITH & CO., on premises, or address D. D. CLARK, Westerley, R. I.

Special Notices.

WANTED.

A practical corniceman can make favorable lease of established shop. Some capital and good references required. Address "H. H.," office of *The Metal Worker*, 59 Dearborn St., Chicago.

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,
Solicitors of Patents.

OFFICES:
PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row.
WASHINGTON,
Atlantic Building, 928 F. St.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.
PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.
E. B. STOCKING, Attorney at Law, 611 F ST., N. W., WASHINGTON, D. C.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address

"STOVE FOUNDRY,"

Office of *The Metal Worker*, 96–102 Reade Street, New York.

Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

THE "TRACER" TELLS.

THE "TRACER" TELLS — Isn't it worth your while to learn what other Wholesale merchants know about Retailers who seek credit from you? The "Tracer" tells.

THE "TRACER" TELLS — Isn't it worth your while to learn from other Wholesale merchants what record your would-be customer has made with them? The "Tracer" tells.

THE "TRACER" TELLS — Isn't it worth your while to be able to ask several thousand merchants everywhere what they know about a man you want to know about? The "Tracer" tells.

THE "TRACER" TELLS — Isn't it worth while to learn that one of your customers, who is prompt in New York. Philadelphia, or St. Louis, is getting *very slow pay* in Chicago and Boston? The "Tracer" tells.

THE "TRACER" TELLS — Isn't it worth while to learn your customers' inside business history, not from outside guesses, but from inside records; *the actual experience of those who have dealt with them?* To learn those things that determine *character* and *business ability* as well as *financial strength?* The things that make you trust or distrust a man? The things that come up in actual business dealings, but which an outsider cannot know? The "Tracer" tells.

THE "TRACER," TELLS — Is he honest? Is he tricky? Is he careful, prudent, shrewd? Has he the qualities of success? Does he cancel orders unjustly? Does he make false claims for deductions? Is his record good or bad? Are his methods good or bad? The "Tracer" tells.

THE "TRACER" TELLS — and it is the *only* thing that tells. Every business man leaves a record, widely scattered in the ledgers and in the minds of merchants far apart That record, if gathered, is the best proof of what a man actually *is*, in his business relations. The "Tracer" gathers these scattered leaves and makes the record complete. The "Tracer" goes to thousands of Wholesale merchants everywhere. From them come a dozen detached bits of experience, concerning one man; together they show his whole business past, and his present condition. Has he over bought? The "Tracer" tells. Is he getting slow? The "Tracer" tells. Is it time for caution? The "Tracer" tells.

HE "TRACER" TELLS — this history to us in fragments. We tell it complete to all who supply the fragments. They supply a few facts; *in return they get a complete history.* In addition to our *unrivaled* "TRACER" report, this Agency gives all the benefits that any other Mercantile Agency can possibly furnish, including a Reference Book of Credits, semi-annually, January and July issues. For terms write: THE JOHN W. EALY COMPANY, New York, Boston, Philadelphia, Chicago, Pittsburgh, or Cincinnati.

SLATE FOR ROOFING AND BLACKBOARDS.
SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS.
AULD & CONGER,
100 EUCLID AVE., CLEVELAND, OHIO.

Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10 inches, Cloth. Price, $3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

CONTENTS:

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Sauce pans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set fo Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS,
Publisher,
96-102 Reade St., NEW YORK.

The Improved White Mountain Freezer



"Excellent Cream!"

And frozen in **4** Minutes with the improved

White Mountain Freezer.

The Leader for 1895. All Dealers Will Want Them.

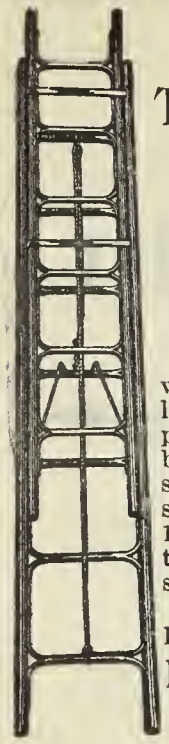
The Best Freezer

The Best Seller

Positively the **only** one having a **duplex dasher** with **double self-adjusting wood scraping bar.**

SOLD BY ALL THE LEADING JOBBERS.

The White Mountain Freezer Co., - - Nashua, N. H.



Look at this Ladder.

THE PATENT BENT RUNG LADDER.

The Strongest, Lightest and Best Ladder Made.

A sixteen-foot ladder only weighs 21 pounds. Extension ladders of this kind are easily put up and taken down by a boy. Our double and single step ladders have no equal. A six-foot step ladder will carry 1000 pounds, and will last three times as long as the old style step ladder.

Write for catalogue and price-list.

Indiana Ladder Co.,

INDIANA, PENNSYLVANIA.

KEUFFEL & ESSER CO.,

127 Fulton and 42 Ann Streets, NEW YORK.

Branches: { 111 Madison Street, Chicago. { 708 Locust Street, St. Louis.

Drawing Materials AND Surveying Instruments.

Write for

Keuffel & Esser Co.'s Catalogue of 1895.

26th Edition.

Enlarged by over 100 pages. The most complete and reliable catalogue, representing the largest and most complete stock in this line.

How Many Beans in a Bushel?

Several customers were chatting in a Lafayette avenue grocery store one evening recently, when the grocer pointed to a half barrel of small beans and asked how many of them it required to make a bushel, says the New York *Herald*.

Various estimations were offered. One man recklessly put the number down at 50,000, which occasioned a laugh from all the others, who had guessed a much less quantity, ranging all the way from 5000 to 20,000.

"Well, gentlemen," remarked the grocer, "you are all wrong. There are approximately 119,000 beans in a bushel."

No one was inclined to believe him. He showed them that it took 60 beans, selected at random, to weigh ½ ounce. The rest of the calculation was simple.

"Now," then said one of the party, "since we are engaged in guessing contests, how many dollar bills would it take to weigh as much as a silver dollar?"

One said 100 and another said 75, while the grocer, who knew all about the beans, put the figures at 300.

"All wrong," remarked the man. "It takes just 22." This was proven to be the case by experiment.

— MAMMA: "You must be very careful. The doctor says your system is all upset."

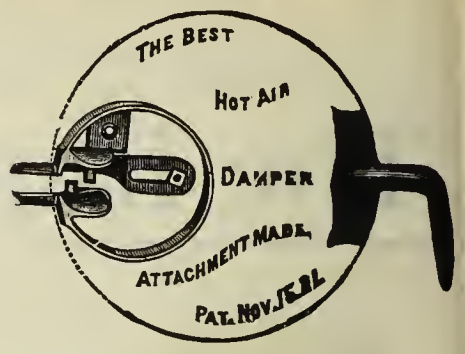
Little Dot: "I guess it is. My foot's as'eep. Foteses must be awfully upset w'en they goes to s'eep at the wrong end." — *Good News.*

— YOUNG TUTTER: "What we want in our society, Miss Maude, are brains, brains."

Miss Summit: "But how are you going to supply them?" — *Vogue.*

Crown Damper and Crown Damper Attachment.





NICKEL PLATED HANDLE. **PUT UP 1 DOZ. IN A BOX.**

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

AMERICAN Dampers and Clips.

WAFFLE IRONS.

THE BEST



For Gas or Gasoline Stoves.

Easy to Clean, Long Wood Handles.

BUY *NO OTHER.*



Wood or Nickel Handle.

BEST SELLER.

ASK FOR THE **AMERICAN.** Buy no Other.



JUST OUT.

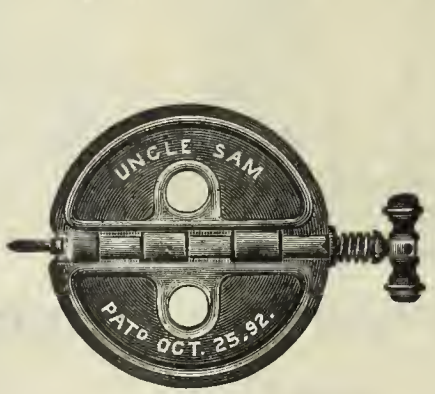
BEST CLIP MADE.

Send for Samples.

GRISWOLD MFG. CO.,

ERIE, PA.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers



W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.

Manufacturers of

Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.



THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

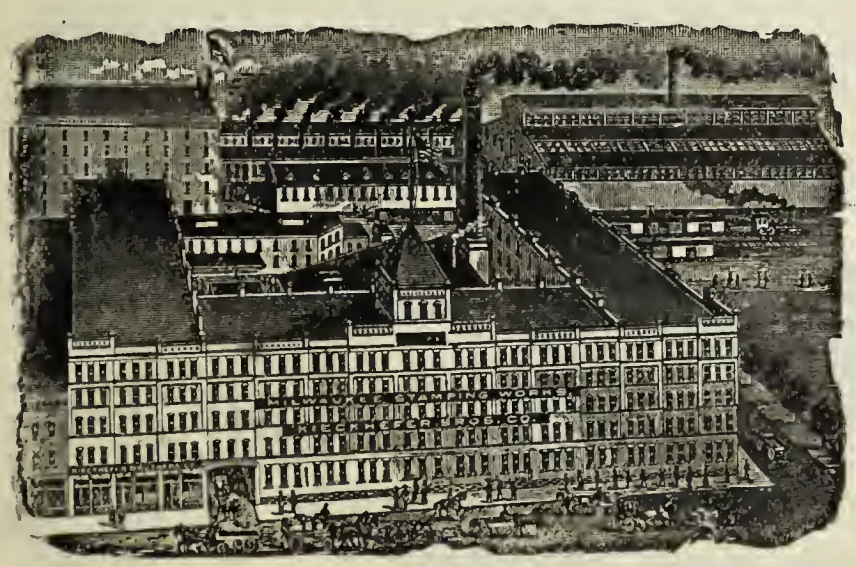


Agents for SPLENDID OIL COOKING STOVES
and MAJESTIC OIL HEATING STOVES,

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED,
JAPANNED AND ENAMELED
PIECED AND STAMPED
Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.

"PRINCESS" CHILD'S TRAYS.

PATENTED.



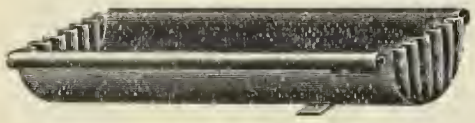
Fitting closely around body of child, and with high protection in front, it gives perfect protection to the child, and prevents soiling of table-cloth and carpet.

MANUFACTURERS FULL LINE

STAMPED, JAPANNED AND PLAIN TIN WARE.

KEEN & HAGERTY, SOLE MANUFACTURERS, BALTIMORE.

"We are Advertised by our Loving Friends."



Pat. Jan. 19th, 1895.

Look Here,

Hardware and Housefurnishing Dealers. An article you **must** keep is the wonderfully popular

Crusty Bread Pan.

The most perfect bread baker ever made. Every lady trying it acknowledges that. **Tests make customers** for this pan, and **that is a fact.** The Clark-Sawyer Co., a big Department Store of Worcester, Mass., say: "They are a good thing, and will make their own way, if people can be made to give them a trial." Your jobber must be in the list below. Write them for prices. They all carry this popular pan in stock.

MADE ONLY BY

The Niles Mfg. Co.,

NILES, OHIO.

HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ill.
HORTON, GILMORE, McWILLIAMS & CO., Chicago, Ill.
WM. FRANKFURTH HARDWARE CO., Milwaukee, Wis.
JOHN PRITZLAFF HARDWARE CO., Milwaukee, Wis.
FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.
R. D. CONE CO., Winona, Minn.
A. F. SHAPLEIGH HARDWARE CO., St. Louis, Mo.
RICHARDS & CONOVER HARDWARE CO., Kansas City, Mo.
WYETH HARDWARE & MANUFACTURING CO., St. Joseph, Mo.
THE GEORGE TRITCH HARDWARE CO., Denver, Colo.
EMPKIE-SHUGART CO., Council Bluffs, Iowa.
SICKELS, PRESTON & NUTTING CO., Davenport, Iowa.
A. BALDWIN & CO., Limited, New Orleans, La.
FITTEN-THOMPSON HARDWARE CO., Atlanta, Ga.
PHILLIPS & BUTTORFF MANUFACTURING CO., Nashville, Tenn.
STRATTON & TERSTEGGE, Louisville, Ky.
THE F. H. LAWSON CO., Cincinnati, Ohio.
VAN CAMP HARDWARE & IRON CO., Indianapolis, Ind.
STANDART BROTHERS, Detroit, Mich.
THE GEO. WORTHINGTON CO., Cleveland, Ohio.
THE McINTOSH-HUNTINGTON CO., Cleveland, Ohio.
L. H. SMITH WOODEN WARE CO., Limited, Pittsburgh, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
CHARLES MILLAR & SON, Utica, N. Y.
BARKER, ROSE & GRAY, Elmira, N. Y.
SHIELDS & BROTHER, Philadelphia, Pa.
C. S. MERSICK & CO., New Haven, Conn.

For

1895

We respectfully solicit your orders for

Pieced Tin Ware,
Stamped Tin Ware,
Japanned Tin Ware,
Black Sheet Iron Ware,
Galvanized Sheet Iron Ware,
Enameled Ware,

and guarantee satisfaction, both as to quality and prices.

Respectfully,

The Geuder & Paeschke Mfg. Co.

Manufacturers,

St. Paul Ave. and 15th St., Milwaukee, Wis.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

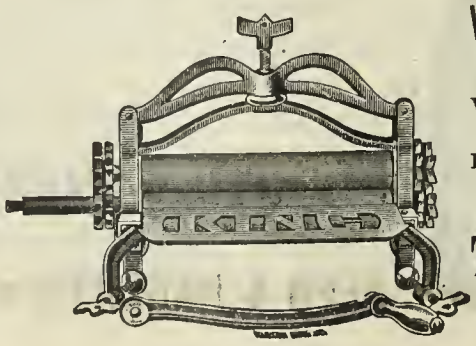
A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.



Weight, 16 ounces. Can be sold in all seasons.
Length, 10 inches.

Write to Manufacturers for Prices.

WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.
Boston Office, H. F. Livermore & Co., 34 Oliver St.

ROCHESTER STAMPING WORKS. ROCHESTER, NEW YORK,



"ROCHESTER" TEAPOT.
Patented.

WANT **50,000** NAMES

To which they may address their

NEW CATALOGUE

For 1895.

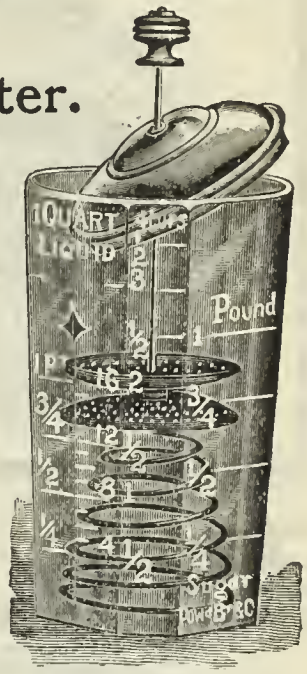
No Goods Genuine without our Name.



"ROCHESTER" CUSPIDOR.
Patent Pending.



THE WONDERFUL LIHGTNING Egg Beater.



Perfect beating in 1 minute.

A combined dry and liquid measurer.

The cheapest and neatest of 'em all.

Once tried always used.

2 sizes.

Write for Prices.

LIGHTNING DASHER EGG BEATER CO.,
TOLEDO, O.

NEW YORK ELBOW CO.,

18 Cliff St., N. Y. City.



Makers of Elbows AND Roasters.



THE TRIUMPH COOKER,

WITH LOCK COVER.
STEAMLESS, ODORLESS AND NON BOIL-OVER.
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.
A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.



THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O,

"NEVER-BREAK" STEEL HOLLOW WARE



WON'T WARP.



WON'T WARP.

STEEL SPIDERS, GRIDDLES, KETTLES, MASLINS, ETC.

Send for Catalogues of all our lines and Discounts.

THE STANDARD FOR WEIGHT, FINISH AND PRICE.

IMMEDIATE SHIPMENTS GUARANTEED.

The Bronson Supply Co., New York and Cleveland.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

Write us for Catalogue and Prices.

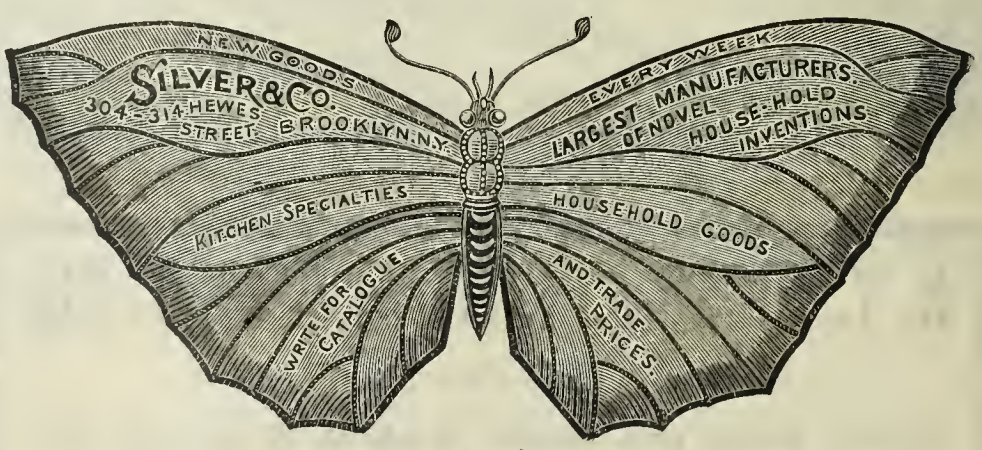


ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.





EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES.

"MARION HARLAND" Tea and Coffee Pots and Urns.

Royal and Crown Roasters and Bakers.

Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses,

Steam Cookers, Milk Sterilizers, Bread and Cake Pans,

Display Stands and Household Novelties.

NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE CONNECTICUT PLATING CO.,

No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work. Estimates cheerfully submitted.



Buy Iwan's Volcano Revolving Ventilating Chimney Top

The best in the World

For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.

FOR SALE BY
Berger Bros., Phila., Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Cincinnati Stamping Co., Cincinnati, O.
Illinois Roofing & Supply Co, Chicago, Ills.

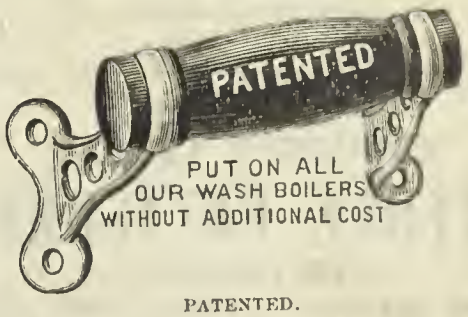
IWAN BROS.
Sole Mfrs., Streator, Ills.



THE DIAMOND THIMBLE IS THE BEST.

Manufactured by
S. CHENEY & SON
MANLIUS, N. Y

ROYAL
WASH BOILER HANDLE.



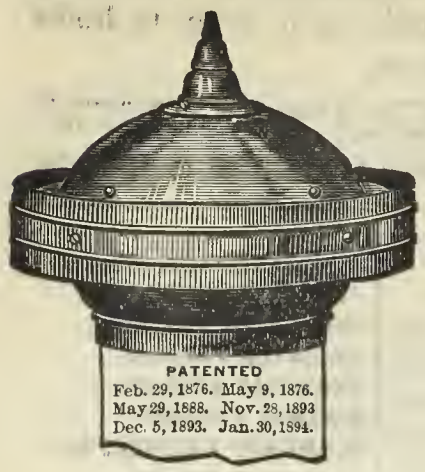
PATENTED.

We call the trade's special attention to the Roya Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,
118 N. 2d St., PHILADELPHIA, PA.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

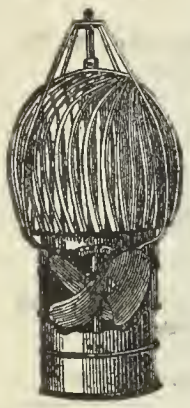
Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,
TROY, N. Y.

SELF LUBRICATING

Rotary Screw Ventilators



WHICH PRODUCE
a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,
Manufacturers,
46 Cortlandt St., New York
☞ *Send for illustrated circular.*

WOOD AND IRON
PATTERNS
FOR STOVES AND FURNACES.
Water and Steam Boiler Work a Specialty.
H. CLAY BASCOM, Prop.,
VEDDER PATTERN WORKS,
TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS
JOHN K. McLAUGHLIN,
215 North 2d St., - - - Philadelphia.
FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction
Cor. Randolph and Atwater Sts.,
Detroit, Mich.

Established 1866.

EDWARD L. CALELY,
STOVE PATTERNS
TO ORDER.
945 Ridge Ave., PHILADELPHIA, PA

CENTRAL PATTERN WORKS,

Stove and Furnace Patterns a specialty. Work first-class under a full guarantee.

E. C. HALTEMAN.
Proprietor, Dayton, O

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers original patterns
MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.
A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH
WHEN HE SAYS THAT THE
RUTLAND LINING
FITS ANY STOVE.
RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO CO.
FIRE BRICK
CUPOLA LININGS A SPECIALTY.
WOODBRIDGE, N. J.

"FIRESTONE"

Has proved itself to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,
TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

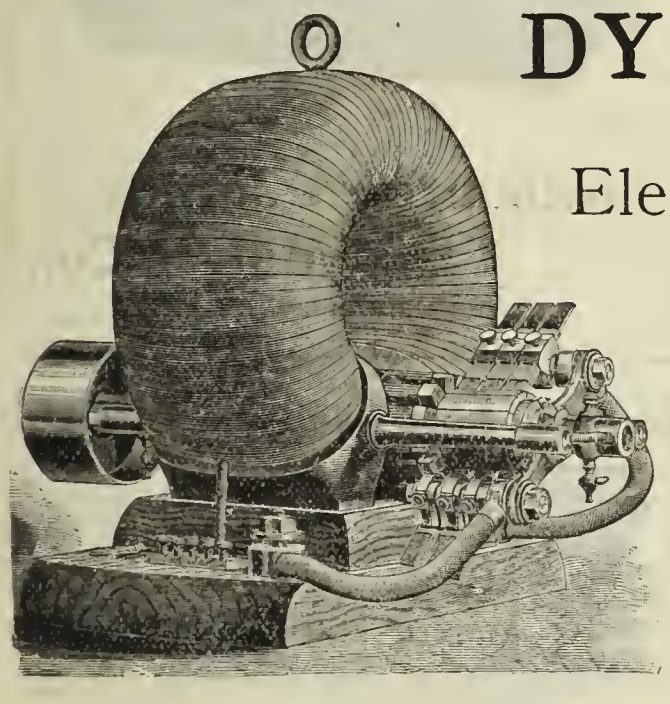
THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

NICKEL PLATING OUTFITS.

ZUCKER & LEVETT & LOEB CO.
8 TO 14 GRAND STREET
NEW YORK, U. S. A.

SEND FOR CATALOGUE OF
NICKEL & ELECTRO-PLATING SUPPLIES & POLISHING MATERIALS.



DYNAMOS
—FOR—
Electro-Plating,

NET PRICES:

No. 0,	200 Gallons,	Nickel,	$100
No. 1,	600 "	"	200
No. 2,	2000 "	"	400

—THE—
Eddy Electric Mfg. Co.,
Windsor, Conn.

ESTABLISHED 1880. INCORPORATED 1887.
The Hanson & Van Winkle Co.,
MANUFACTURERS OF
NICKEL AND ELECTRO PLATERS' MATERIAL.



Nickel-Plating Outfits
From $20 upward.
DYNAMO-ELECTRO MACHINES
For all purposes.
The New H. & V. W. Dynamo Machine.
In sizes from No. 1 to No. 5.
FROM $100 TO $800.
These machines will be placed on 30 days' trial with responsible parties and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.
219-221 Market St., Newark, N. J.
81 Liberty St., New York.
35-37 South Canal St., Chicago, Ill.

WE FURNISH EVERYTHING.

The Packard Enameling Co.,



400 NORTH AVE.,
Warren, O.
—MANUFACTURERS OF—



Plain, Stained and Enameled Handles, Knobs and Pail Woods.

WRITE US FOR CATALOGUE AND PRICES. OUR WORK EXCELS.

SECOND EDITION.
PRACTICAL HINTS
—ON—
JOINT WIPING,
FOR BEGINNERS IN PLUMBING,
WITH THIRTY-FIVE ILLUSTRATIONS.
43 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

Columbus

WROUGHT STEEL SINKS

ARE DRAWN FROM A SINGLE SHEET OF STEEL, AND ARE SUPERIOR TO CAST IRON SINKS IN EVERY PARTICULAR; BEING LIGHTER, STRONGER AND MORE DURABLE. WILL NOT BREAK FROM HEAT, COLD OR ANY CAUSE WHATEVER. BEING LESS POROUS THAN CAST SINKS, ARE COMPARATIVELY ODORLESS, AND THEIR GREAT ELASTICITY AVOIDS THE BREAKAGE OF DISHES.

THE BOTTOM IS FORMED TAPERING TO THE CENTER AND THE OUTLET, SO THAT THE DRAINAGE IS PERFECT, AND ENABLING THE ATTACHMENT OF STRAINER AND PIPE MORE SATISFACTORILY THAN IS POSSIBLE WITH ANY OTHER MAKES.



We Are The Originators

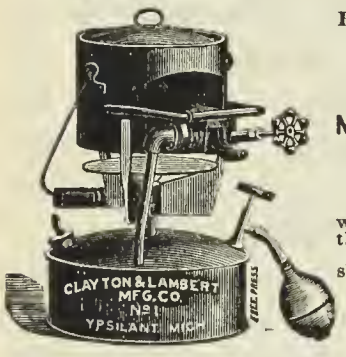
OF THE WROUGHT STEEL SINK, AND ARE IN POSITION TO SUPPLY THEM IN ANY STYLE FINISH DESIRED, AND IN MANY DIFFERENT SHAPES, AT PRICES THAT WILL BE NAMED.

THE

Kilbourne & Jacobs Man'fg Co.,

Columbus, Ohio, U. S. A.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

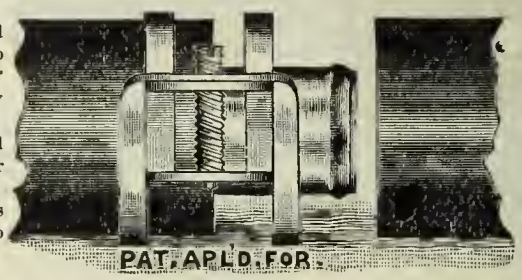
No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.
Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screwdriver being al the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust. Sold by Jobbers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.

CLIMAX AUTOMATIC CELLAR DRAINER.

A Cheap, Reliable Remedy.

Never Failing.



It lifts water from Cellars, Wheel Pits, etc. and carries it into the street or sewer.

Requires no attention.

The Climax Gas Machine and Mixer stands at the head; makes brilliant, smokeless, steady and very cheap gas for stores, churches, etc.

WRITE FOR PAMPHLET.

C. M. KEMP MFG. CO.,
Baltimore, Md.

— A CLEVER GIRL.— Jack: "There, Marie, see what your steering of the boat has done for us. We are stuck in the mud and will have to be helped out."

Marie: "Why, you silly boy, just see how much longer we can stay out, and such a good excuse, too!"—*Exchange.*

DRAWN STEEL SINKS

Anchor and Diamond Brand

—MANUFACTURED BY—

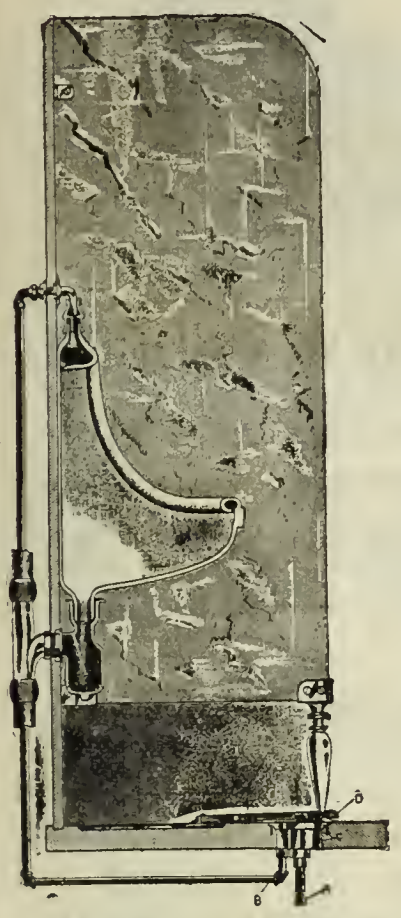
L. Wolff Manufacturing Company,

GENERAL OFFICES, 93 W. Lake Street, Chicago.

Write for Illustrated Price-List Just Published.

AUTOMATIC FLUSHING VALVE FOR URINALS.

OPERATED BY TREADLE.



This is the neatest and most economical method yet designed for the purpose. Urinals flushed by this method will be cleaner and freer from stoppage than those flushed by any other system, and less water consumed in doing it, for the simple reason that the flush only occurs when the urinal is in use.

The operating valve has a flange on its upper end for bolting to the floor, and which is let into the floor slab, thus presenting a smooth flush surface which can be easily washed. The top of the valve is arranged with a cap; by unscrewing this all the working parts, including the seat, can be taken out for repairs when necessary, thus leaving nothing but the main supply "A," the supply to Urinal "B," and the Valve Chamber "C," either in or under the floor, and these parts may be considered almost imperishable.

The treadle "D" is Cast Iron, galvanized (also furnished in brass), one end of which is fastened to the floor slab by brass bearings which permit of its being thrown back for the purpose of cleaning under it. The other end rests on the valve spindle.

When a person stands on the treadle (and he cannot get at the urinal unless he does), the flush begins and continues until he leaves it, when the valve closes automatically. By this method the flushing water is delivered at the time it is most required, and is, therefore, unlike the periodical flushing tank, which is delivering water regardless of whether the urinal is in use or not, and so wasting water.

Dalton-Ingersoll Company,

169 to 175 High Street,

Fort Hill Square, - - BOSTON.

Chicago Branch: 65 Washington St., Institute of Building Arts.

New York Agency: C. Hoffman, Jr., 277 Pearl St.

THE KELLY

Self-Acting Frost-Proof, After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

—SEND FOR CATALOGUE.—

Thomas Kelly & Bro.,

124 Franklin St., Chicago,

Manufacturers of Permanent Plumbing Goods.

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

INEXPENSIVE.

It is light, durable, cleanly, low in price, never rusts out, cannot break. Can be decorated to suit individual taste. A boon to country householders, who by its use can enjoy a comfortable bath without expensive piping or the labor of carrying water. There are many styles and sizes of the **Steel Clad Bath**, but only one quality. Don't buy an imitation. Get the **Steel Clad**. All plumbers and jobbers have it, or the

STEEL CLAD BATH CO. OF NEW YORK,

447 to 453 W. 26th St., New York City.

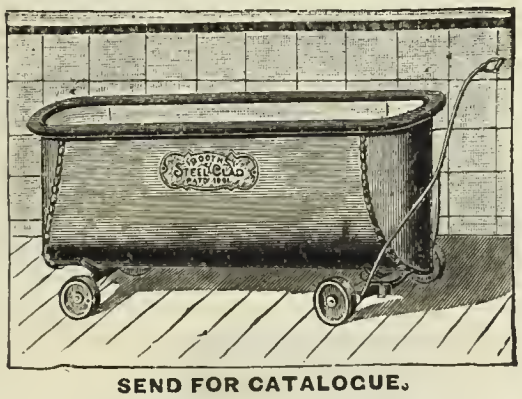
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,

Detroit, Mich.

GEORGE BOOTH, President.

FOR HOSPITALS AND THE SICK ROOM.



SEND FOR CATALOGUE.

DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.



The only Portable Folding Bathtub made; can be stored in space 2¼ x 2½ x 6 feet; can be moved from bathroom to sickroom.

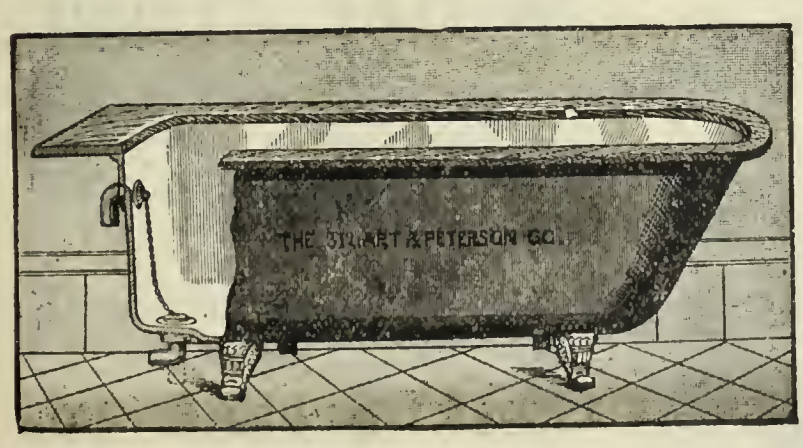
Write for catalogue and discounts

MADE BY

THE DAY MFG. CO.

Detroit, Mich., U. S. A.

WELL!! WELL!! WELL!!



PORCELAIN LINED BATHTUBS, WITH Overflow Strainers and Plugs Complete

$28.00

WRITE US.

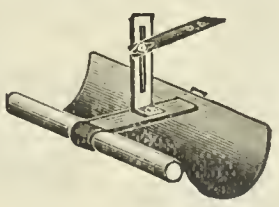
The Stuart & Peterson Co.,

Burlington, N. J., U. S. A.

Porcelain Lining to order.

Special Goods to Order

RICHMOND



E. T. HANGER. PATENTED.

TINNER, ATTENTION!

The cross-bar is hooked firmly to both sides of the trough. The slotted upright, with thumb-screw, permits instant adjustment to the requisite fall. It is never necessary to bend the suspending rod to suit pitch of roof. No obstructions to catch leaves and dirt, as in other adjustable hangers. **Save Time and Money.** Sample order freight allowed. For sale by first-class Jobbers. Manufactured by

JOHN SEVERDING. - - Richmond, Ind.

MAPLE SYRUP CAN and SAP BUCKET STOCK.

We are now prepared to quote and ship promptly. Get our prices before buying.

J. M. & L. A. OSBORN, - - - CLEVELAND, O.

— A CORRECTION.—"Who is the author of the song 'Ben Bolt'?" asked the New York girl.

"Thomas Dunn English," said the Philadelphia girl.

"That cannot be the name," said the Boston girl.

"Why not?"

"It must be Thomas Did English."



W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON

156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS

REVERSIBLE STEEL AND WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.

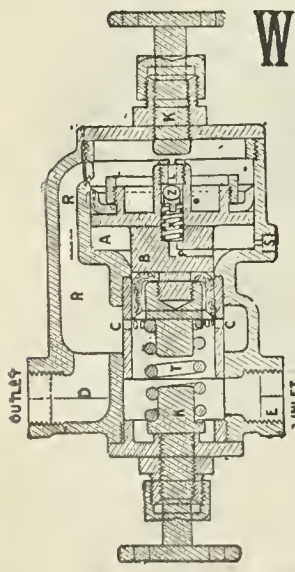


MYERS' FORCE AND LIFT PUMPS



Simple, durable, powerful, easy to operate never affected by frost. Patent GLASS VALVE, will never corrode. Ask your dealer for our goods. Write for catalogue.

J. E. MYERS & BRO. ASHLAND, O.



W. G. Taafel's Pressure Regulator.

Send for Price-List

NEWARK REGULATOR COMPANY

Newark, Ohio.

— WILLIS: "Putting a pin in a person's chair is an old joke."

Wallace: "Yes, but it hasn't lost its point yet."—*Life.*

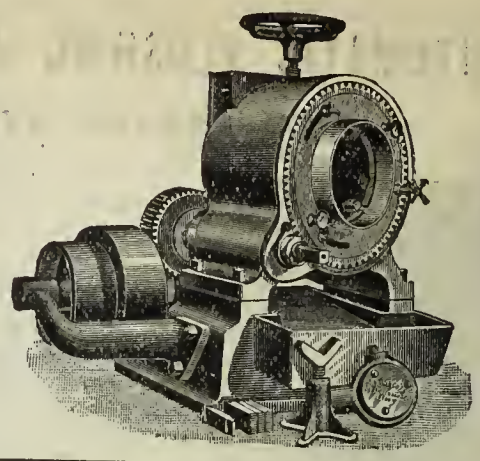
When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

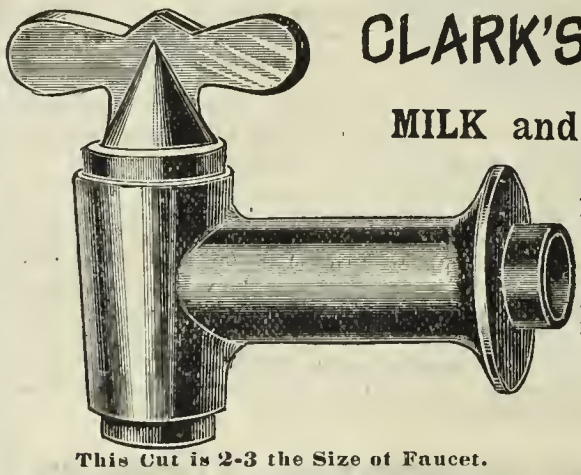
Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.



No. 2 Hand or Power Pipe Threading Machine. Range 2¼ to 4 inch R. H.



This Cut is 2-3 the Size of Faucet.

CLARK'S NEW FAUCET

—FOR—

MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.



GUM A RUBBER,

Or

RUBBER GUM,

Or

Elastic Cement.

No matter what you call it,

IT'S A DANDY.

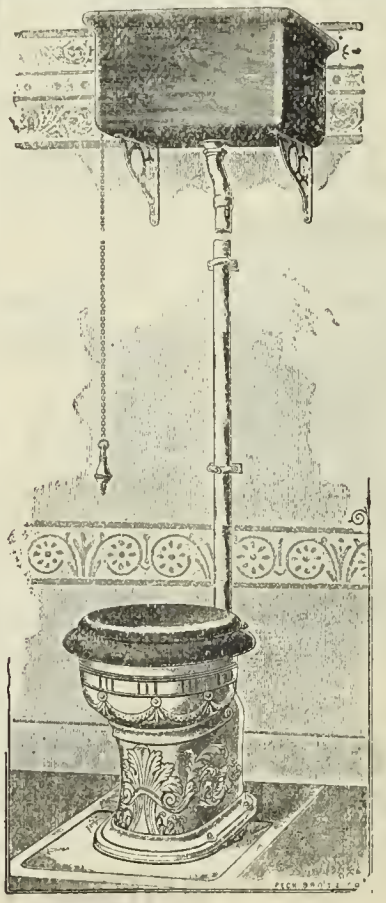
Just what you want to make a pipe joint tight. It discounts

WAX, RED LEAD, BLACK LEAD.

Holds the mercury sky high on a test job.

BAILEY-FARRELL MFG. CO.,

PITTSBURGH.



THE TRIPLE JET

SYPHON

Water Closet.

A Clean Fixture,
A Beautiful Fixture,
A Perfect Fixture,
A Sanitary Fixture,
A Durable Fixture.

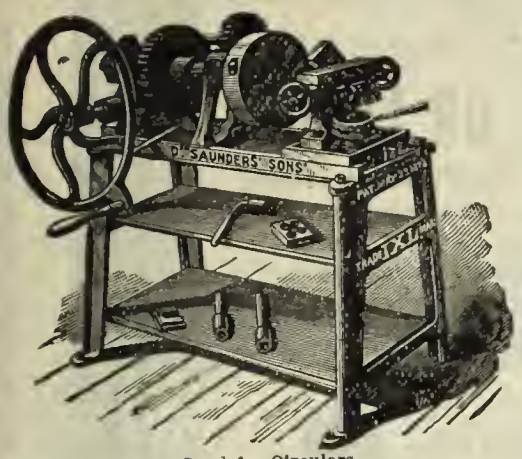
Peck Bros. & Co.,

FINE SANITARY GOODS,

47 Cliff Street, New York
259 Wabash Avenue, Chicago.
65 Oliver Street, Boston.
127-37 Chestnut Street, New Haven, Conn

D. SAUNDERS' SONS,

MANUFACTURERS OF THE ORIGINAL



Send for Circulars.

TRADE **I. X. L.** MARK

Pipe Cutting and Threading Machine.

Beware of imitations. None genuine without our Trade-Mark and Name.

STEAM AND GAS FITTERS, HAND TOOLS.

Also, Patent Wheel Pipe Cutters.

AS SHOWN BY THE CUT.

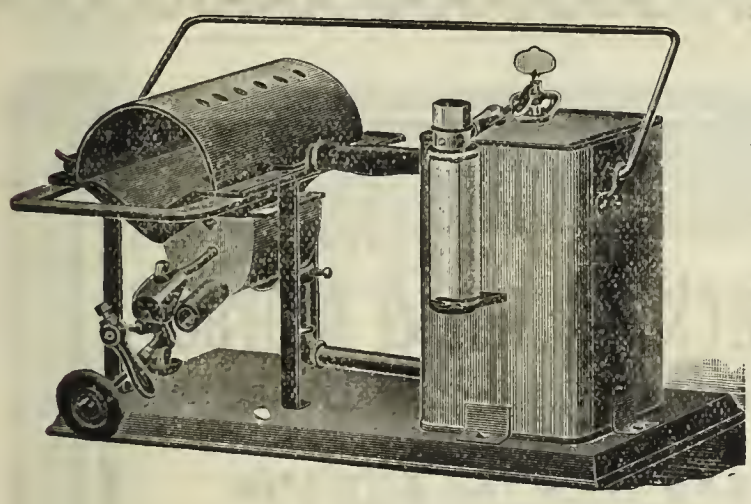
Pipe Cutting and Threading Machines for Pipe Mill Use a Specialty.

27 Atherton St., Yonkers, N. Y.



Hull's No. 3 Bonanza Furnace.

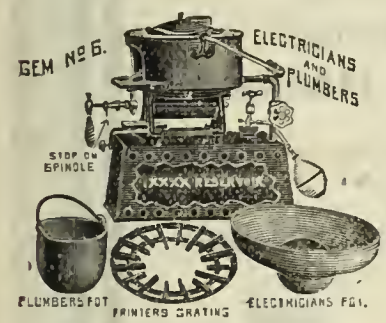
FOR TINNERS ONLY.



Price, Heavy Tin Tank. $6.00.
Price, Copper Tank, $7.00.
Price, Tin Tank and Bulb Pump. $5.50.

Very convenient for Bench use. Hinged arch top. Tin or copper tank. My new Bonanza double burner strikes the coppers on both sides. Hottest fire ever produced from gasoline. Will heat largest coppers fast enough to use. My Rubber Air Pump, Handle or Bulb Pump, as may be desired. The strongest wind can't blow it out. One dollar off cash with order. Write for circulars.

M L. HULL,
Cleveland, - Ohio.



BURGESS GEM No. 6,

Electricians', Plumbers' and Tinners' Furnace.

GUARANTEED to melt 12 pounds of lead in eight minutes.

GUARANTEED to heat coppers and melt lead at the same time.

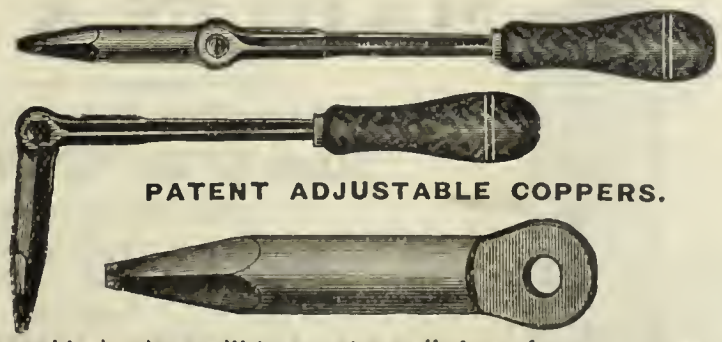
GUARANTEED that if it cannot be worked out of doors or on roofs in all kinds of weather your money will be refunded.

MANUFACTURED BY **Burgess Soldering Furnace Co.,**

COLUMBUS, OHIO.

Covert Pat. Adjustable Soldering Irons and Coppers

It is a complete tool in every respect, and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.



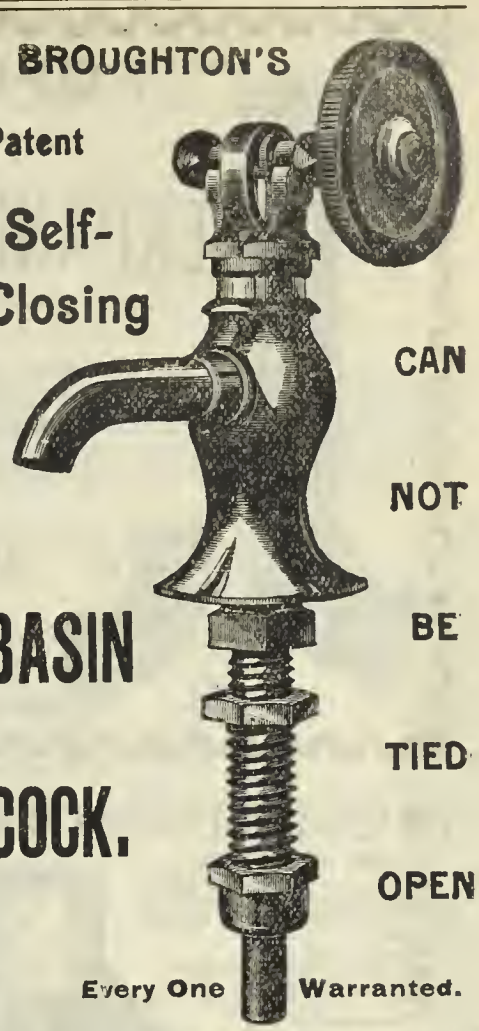
PATENT ADJUSTABLE COPPERS.

☞ A sample of ⅞ in. soldering iron will be sent by mail, free of postage to any address, on receipt of sixty cents (60c.).

FOR SALE BY ALL GENERAL HARDWARE AND PLUMBERS' SUPPLY HOUSES.

COVERT MFG. CO., - West Troy N. Y.

BROUGHTON'S Patent Self-Closing BASIN COCK.



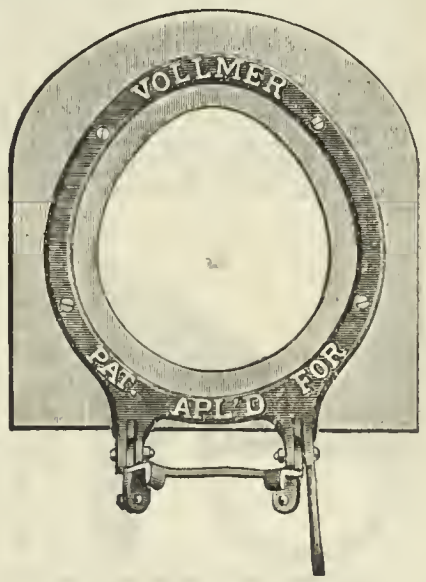
CAN NOT BE TIED OPEN.

Every One Warranted.

Stebbins Mfg. Co., BRIGHTWOOD MASS.,

SOLE MANUFACTURERS.

Vollmer Closet Seat.



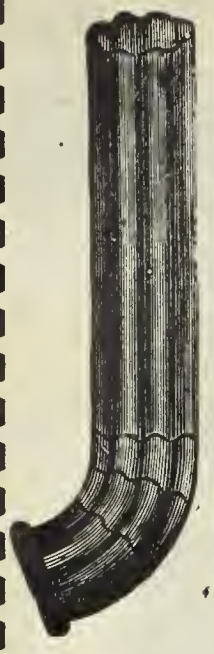
Can be attached to any Philadelphia Hopper by adjusting 2 set screws.

SEND FOR CATALOGUE.

ZERO VALVE CO.,
212 Seneca Street, - BUFFALO, N. Y.



OUR ADJUSTABLE STOCKS and DIES are universally acknowledged to be the **BEST**! We also make all our Tools on the same principle, of the **Best Material** and **Workmanship**, and always with a view of *time and labor saving in their use.*



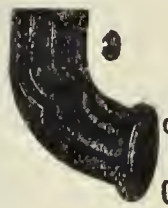
POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



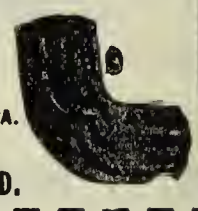
W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.





THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

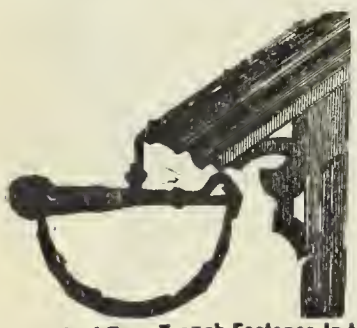
MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

8-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.



TINNERS, ATTENTION! GREAT REDUCTION IN PRICE.

Best Eave Trough Fastener in the World.

Yapp Patent Champion Fastener

MANUFACTURED BY

WALTHER & CHRISTMAN,

Successors to CHAS. BODY,

269 to 275 Central Ave., Cleveland, Ohio

Send for sample and price-list

EAVES TROUGH HANGERS.

PROUDMAN BROS.,

MERIDEN, CONN.





STYLE S.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

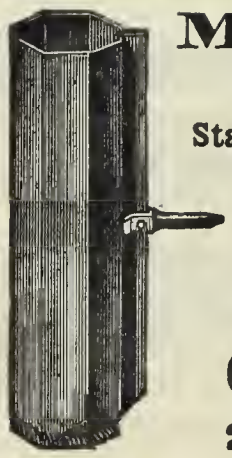
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,



(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

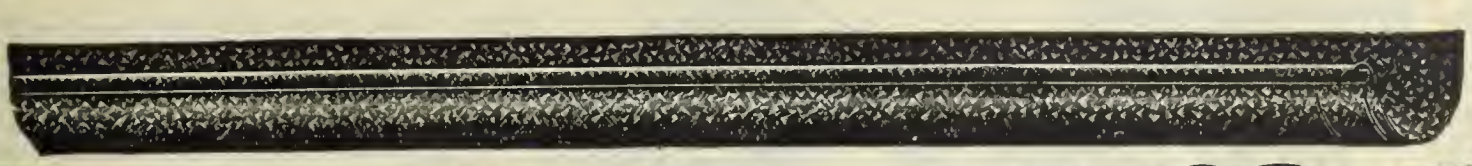
206 Robinson St., ALLEGHENY, PA.





BOWERS ROOFING AND METAL WORKS.

Eaves-Troughs, Gutters, Miters, Trough-Ends, Conductors, Ridging. **BINGHAMTON, N. Y.**





Berger Bros.,

TINNERS' HARDWARE, ROOFERS' SUPPLIES.

231 and 237 Arch St., Philadelphia.

GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,

. . . . Largest Stock, Greatest Variety, Prompt Shipments.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Hods, Elbows, Ears, Handles, Valves and Plungers, Etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.

If you want the best

Eave Trough,

Conductor Pipe, etc.,

Write us at once and get our prices. We can save you money, as well as furnish you with superior goods manufactured on new and greatly improved machinery—Address

The Kanneberg Roofing Co.,

Canton Ohio

USE "OUR OWN" BASIN PLUGS.



No other lettering on them.

SAMPLE DOZEN ASSORTED $1.

HANDSOMELY NICKELED. BEST QUALITY STOCK

H. O. CANFIELD,

MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.



THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR.

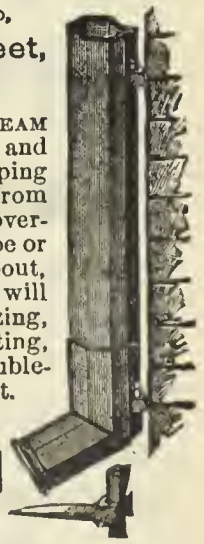
MANUFACTURED BY THE

S. S. S. Conductor Co.

LIMITED,

163 Lacock Street,

ALLEGHENY, PA.



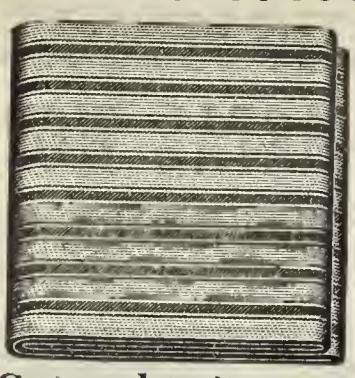
THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.



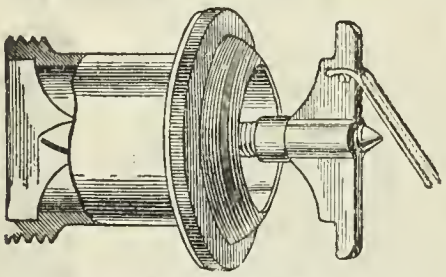
"Columbia" Wiping Cloths FREE!

Not free exactly from a financial standpoint (altho' very near it), but free from all defects due to a **Poor Quality of Ticking, Carelessness in Making and a Bungling Manner of Fastening the Ends.** A cloth free from the above defects is well worth the price we ask, 12 cents each, or six for 70 cents. Remember we make any kind—send us the size you want, giving the wiping edge first.

THE J. W. CHAMBERLAIN CO.,
Plumbing & Steam Fitting Specialties,
BANGOR, MAINE.

CLOSET REPAIR COUPLING.

(Patent applied for.)



MADE in two styles, to suit iron and lead pipe.
TAKES the place of the old spud and necessitates no change in fixtures.

MANUFACTURED ONLY BY
SAVILL, WALLS & CO.,
Mfrs. of Plumbers' Supplies,
229 Budden Street - - - PHILADELPHIA.

Leather and Rubber WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 39th Street, NEW YORK.

LEAD PIPE, SHEET LEAD, SHOT,

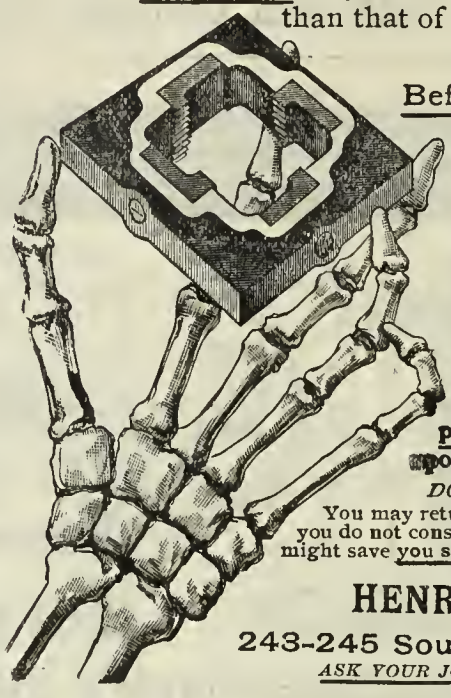
Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers
IMPROVED SANITARY WATER CLOSETS.
Wrought Iron Pipe of all sizes cut to order.

Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

1

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

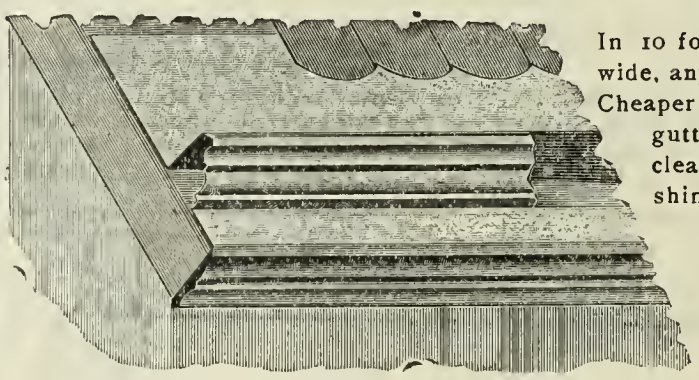
A sample One-inch "Skeleton" Pipe Die, either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you 62 cents, and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

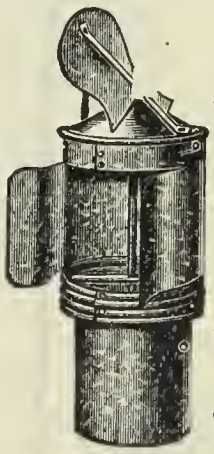
HENRY B. PANCOAST & CO.,
243-245 South 3d Street, Philadelphia, U. S. A.
ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.

Sims' Ornamental Roof Gutter.



In 10 foot lengths, 12 in. to 30 in. wide, any fall desired, will not leak. Cheaper than wood or any other gutter. One continuous piece, clear up under slate or tin or shingle. Write for prices.

The
Sims Mfg. Co.,
Newark, O.



REVOLVING CHIMNEY CAPS,

Galvanized Iron.

These Caps revolve on heavy glass bearings, and are made from No. 26 iron. All sizes; cheapest and best.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted Leader, cheapest and best in the market. Sheet Iron Piping, Stove Pipe and Fittings of every description.

GENERAL GALVANIZING TO ORDER.

THE JERSEY CITY GALVANIZING CO., Manufacturers and Jobbers in
GALVANIZED MATERIAL OF EVERY DESCRIPTION.

Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE.

The "O. H." One Piece PLAIN ROUND and CORRUGATED

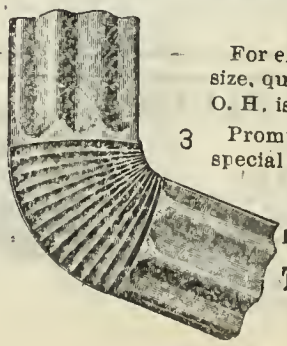
CONDUCTOR AND STOVE PIPE ELBOWS.

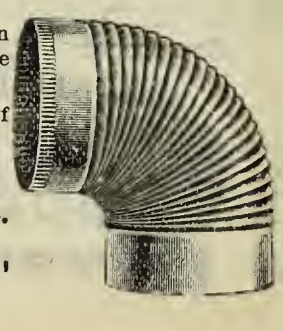
(PATENTED OCT. 25, 1892.)

For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.





For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,
WAVERLY, N. Y.

PHILADELPHIA, JANUARY, 1895.

Architects AND Roofers

Please Read this Proclamation.

It relates to our

"Pennsyl" Old Method Terne OR Roofing Plate.

Article 1st. It is **Treble Coated, Stamped** and **Squared.**

" 2d. It was introduced by us in the year 1879.

" 3d. We now sell 50 boxes where we sold one box 5 years ago; this alone is sufficient guarantee of its merits.

" 4th. We **guarantee** every box of 20 x 28 to contain not less than **45 lbs.** of actual coating to 112 sheets.

" 5th. It is simply out of the question for us or **any other Manufacturer** to possibly make a better Roofing Plate.

" 6th. We ask no favoritism, only justice.

" 7th. Consult any Roofer or Tinner in your City or Town and they will give you unbiased proof of its real value.

Samples cheerfully mailed.

Gummey, Spering & Co.,

Manufacturers and Importers

Tin Plate and Metals.

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. **BRIDGEPORT, OHIO.**

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,

535 to 547 West 15th Street, New York.

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS.** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade.

TIN AND IRON SHOW CARDS.

110 John St., - New York.

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

THE CAMBRIDGE IRON & STEEL CO.

MANUFACTURERS OF

GALVANIZED CAMBRIDGE C I & S CO BEST TRADE MARK SHEET IRON

BLACK SHEETS FOR ROOFING & CORRUGATING. PICKLED & COLD ROLLED FOR STAMPING

CAPACITY RANGES FROM No. 30 26 INCHES WIDE TO 1×4×40×120

CORRESPONDENCE SOLICITED OFFICE & WORKS CAMBRIDGE, OHIO.

ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.

Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

BEWARE OF IMITATIONS.

"BREVITY" MAY BE "THE SOUL OF WIT"—

But short pieces of tin do not make "TANDEM" CONTINUOUS ROOFING....

CUSTOMERS are told what to expect—and get it. In "TANDEM" they get a roll of good, prime tin, 96 in. long, furnished either 14 in., 20 in. or 28 in. wide; and, if desired, THOROUGHLY WELL PAINTED.....

"TANDEM" is put on the market under no false pretenses. It is not a light weight tin; it is not made from 14 x 20 in. or 20 x 28 in. sheets—and IS NOT SOLDERED BY HAND.....

"TANDEM" Continuous Roofing Tin is made in IC and IX thicknesses. Primes and Wasters are sold separately. Before buying continuous roofing tin, be sure of what is being offered you in competition with "TANDEM".....

MERCHANT & CO., Inc.,

PHILADELPHIA, NEW YORK, CHICAGO, BROOKLYN, LONDON.

NEW CASTLE

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

New Castle Steel and Tin Plate Co., New Castle, Pa.

THE PHILLIPS TIN PLATE CO., Philadelphia, Pa.

"F. R. P. EXTRA." Treble coated. Oil Finish. Guaranteed to carry 45 lb. coating.
"PHILLIPS ROOFING." Extra heavy. Bright finish. " " 35 lb. "
"BOSTON." Heavy Spangled Terne. Guaranteed to carry 20 lb. coating.
"NATIONAL." (Worcester grade.) " " 10 lb. "

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

TRADE MARK AMERICAN CLEANED.

BLACK DIAMOND EXTRA TRADE MARK COATED ROOFING PLATES

are thoroughly AMERICAN

in every respect. One trial will convince you of their superiority over anything you have ever used. Send for sample and thoroughly test it. Manufactured by HENRY W. SCATTERGOOD.

Black Diamond Tin Plate Works, 51 & 53 Laurel St., Phila.

Standard Books
—ON—
FOUNDRY PRACTICE

The Encyclopedia of Founding and Dictionary of Foundry Terms,

used in the practice of molding. Together with a description of the tools, mechanical appliances, materials, and methods employed to produce castings in all the useful metals and their alloys, including brass bronze, steel, bell, iron and type founding, with many original mixtures of recognized value in the mechanic arts. Also aluminum, plating, gilding, silvering, dipping, lacquering, staining, bronzing, tinning, galvanizing, britannia-ware, German silver, nickel, soldering, brazing, ores, smelting, refining, assaying, etc. By SIMPSON BOLLAND, Author of "The Iron Founder," "The Iron Founder" Supplement. 12mo.: cloth.....$3.00

The Pattern Maker's Assistant

Embracing lathe work, branch work, core work, sweep work and practical gear constructions, the preparation and use of tools, together with a large collection of useful and valuable tables. Sixth edition. By JOSHUA ROSE, M. E.; illustrated with 250 engravings; 324 pages: cloth.....$2.50

Modern Molding and Pattern Making.

A practical treatise upon pattern shop and foundry work. By JOSEPH P. MULLIN, M.E.: 257 pages; cloth; illustrated. $2.50

Iron and Steel Founding.

Illustrated with 39 diagrams. By C. WYLIE Second edition, revised and enlarged; 324 pages; 8vo; cloth... .....$2

The Practical Brass and Iron Founder's Guide.

A treatise on brass founding, molding, the metals and their alloys, etc. By JAMES LARKIN, late conductor of the brass foundry department in the Penn Works, Philadelphia. A new revised and greatly enlarged edition. Contents: Among the most important and entirely new sections of this edition of this valuable and popular book are the following: Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to Other Metals; Casting Iron and Other Metals Upon Lace, Embroideries, Fern Leaves and Other Combustible Materials; Some Modern Bronzes. In one volume; 12mo; 400 pages.....$2.50

American Foundry Practice.

Treating of loam, dry sand and green sand molding, and containing a practical treatise upon the management of cupolas and the melting of iron. By THOMAS D. WEST, practical iron molder and foundry foreman. Fully illustrated. Eighth edition, revised. 408 pages; cloth.....$2 50

The Iron Founder.

A comprehensive treatise on the art of molding, including chapters on core-making, loam, dry sand and green sand molding, also crystallization, shrinkage and contraction of cast iron and a full explanation of the science of pressures in molds, added to which are formulas for mixtures of iron, tables, rules and miscellaneous information. By SIMPSON BOLLAND. Illustrated with over 300 engravings. 12mo, cloth....$2.50

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings, wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. Illustrated with over 200 engravings; 400 pages; 12mo; cloth..... ...$2.50

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96-102 Reade St., New York.

Bright Charcoal Tin Plates.

Coke Tin Plates.

A Full Assortment of Sizes.

ALSO

20 x 28 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.		
IC	CLYRO—Old Way, Stamped and Squared.		
IC	M F Stamped and Squared.		
IC	PONTYMISTER—Old Style, Stamped and Squared.		
IC	KILLEY—Extra Coated, Stamped and Squared.		
IC	L P L—Extra Coated, Stamped and Squared.		
IC	LILY—Stamped and Squared.		
IC	DYFFRYN,	200 lbs.	PETREL.
IC	WORCESTER.	IC	ALYN.
200 lbs.	WORCESTER.	IC	BAAN.
IC	W T R—Stamped.	IC	MANSEL.
200 lbs.	W T R.	IC	ALBAN.
IC	P T L.	200 lbs.	ALBAN.
IC	DEAN	190 lbs.	ALBAN.
200 lbs.	DEAN.	200 lbs.	CAWDOR.
IC	PETREL.	190 lbs.	CAWDOR.

14 x 20 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.		
IC	CLYRO—Old Way, Stamped and Squared.		
IC	M F—Stamped and Squared.		
IC	PONTYMISTER—Old Style, Stamped and Squared.		
IC	KILLEY—Extra Coated, Stamped and Squared.		
IC	L P L—Extra Coated, Stamped and Squared.		
IC	W T R—Stamped.		
100 lbs.	W T R.		
IC	P T L.		
IC	DEAN.		
100 lbs.	DEAN.		
IC	PETREL.		
100 lbs.	PETREL.		
100 lbs.	CAWDOR.		
IC	BAAN.		

WASTER ROOFING.

ICW	20x28	GWERNEN.
ICW	"	W T R.
200 lbs. W	"	ALBAN.
190 lbs. W	"	ALBAN.
180 lbs. W	"	DYFFRYN.

SOLDER—The reduction in Pig Tin has made prices much lower.

RUSSIA SHEET IRON (Genuine)—The duty has been reduced, and prices are lower than last year. No. 8 to No. 16 inclusive, sheets 28x56 inches.

BRUCE & COOK,

190 Water St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ILLINOIS ZINC COMPANY.

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. Brooklyn, N. Y.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty*

Buy Plain and Corrugated Conductors and Single and Double Beaded Eave Troughs, all in 10 ft. lengths; also Brick Siding, Corrugated Roofing, Cornices, &c., of

ALLEN'S CORRUGATING WORKS,

422 and 424 W. Randolph St., CHICAGO, ILL.

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

—MANUFACTURERS OF—

SHEET METAL ROOFING, SIDING AND CEILING

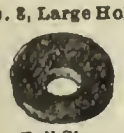
—OF ALL DESCRIPTIONS FROM—

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.

Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.

Factory, 113 to 133 Soulard Street, ST. LOUIS, MO.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size. CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. LITTLEFORD BROS., OLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96 102 Reade St., New York.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.

AMERICAN ROOFING CO.,
ST. LOUIS and CINCINNATI.

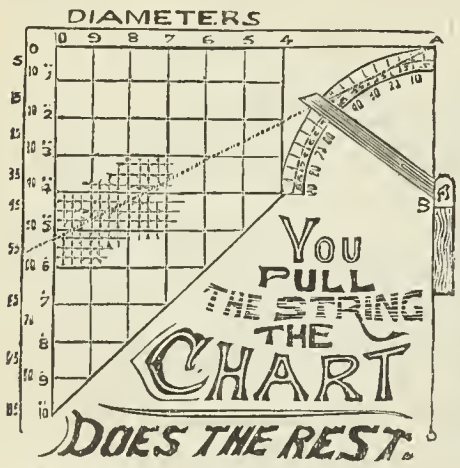
Mention this paper.



James A. Miller & Bro.,
129 and 131 South Clinton St.,
CHICAGO,
MANUFACTURERS

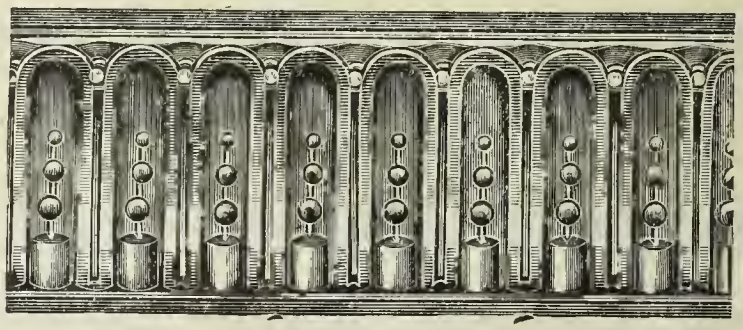


FOR
ROOFING AND SIDING.
Send for Circular and Prices.



ELBOW PATTERN CHARTS.
Quick method. Easy to learn. Good to have. Over 1000 sold. 50c. by mail.
A. L. BURTIS, Lockport, N. Y.

Friedley & Voshardt,
194 and 196 Mather St., Chicago, Ill.,



MANUFACTURERS OF
Sheet Metal, Zinc and Copper Ornaments
For Interior and Exterior Work, Steel Ceilings, Statuary, &c.
Send for our new 1894 Catalogue and Prices.
Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.





— A SURPRISE IN CHICAGO.—"Doctor," said the literary critic, anxiously, "I wish you to tell me the worst, even though it necessitates my removal to an asylum."

"What are your symptoms?" inquired the physician.

"Last night," responded the patient, with a tremor of terror in his voice, "while riding in a cable train I stood near the stove and I thought I felt it giving out heat."—*Chicago Record.*

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

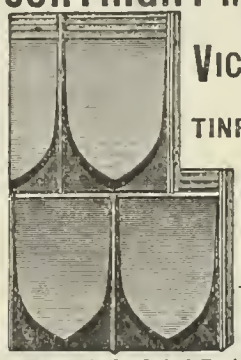
Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.

CORTRIGHT METAL SLATES



and

VICTORIA SHINGLES

Made of

TINPLATE, (Full Weight Only)

Galvanized Steel

and

COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office, 134 Van Buren Street, Chicago.



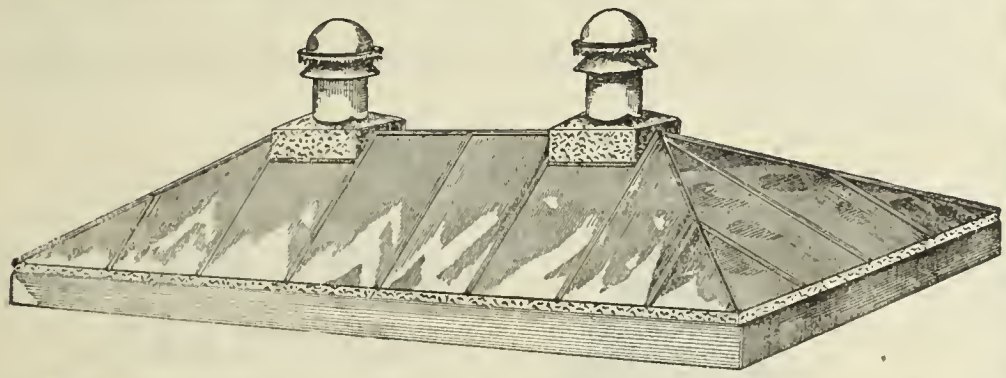
Defy Fire and Time

WITH OUR

Steel Roofing,
Steel Ceilings, (Patented)
Corrugated Iron, Conductor Pipes, Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,
Office and Works, Wheeling, W. Va.
Office and Warehouse, 474 Laflin St., Chicago.
Office and Warehouse, 81 Fulton St., New York.



Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.



WORLD'S FAIR AWARD.

We are the only Steel Roofing Co. awarded Medal and Diploma for PATENT CAP ROOFING at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.



IRON ROOF CRESTING.

Full line of new and desirable designs.

S. GREEN & SONS, Des Moines, Ia.

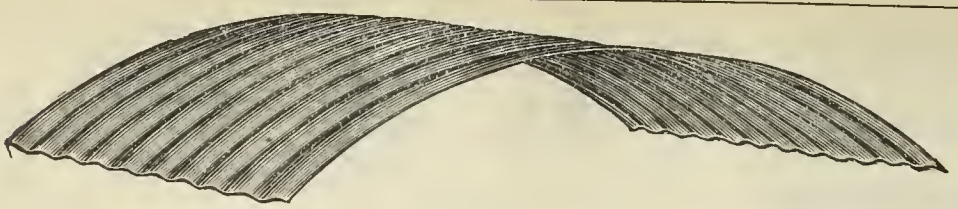


JOHN SANBORN.

Dealer in Metals,

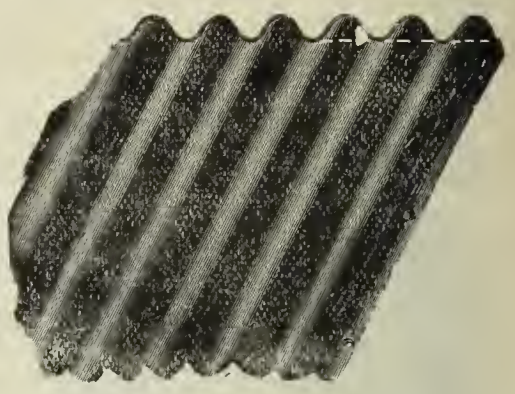
and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,

217 WATER STREET,
Beekman Street, NEW YORK.



Curved and Corrugated

Sheets for Structural Purposes



Any size and dimension, ready for placing in position without trimming. Lightness, strength and durability insured at a minimum cost.

Such as Houses, Barns, Factories, Warehouses, Granaries, Sheds, Etc.

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.



Hicks' Guide FOR Builders,

Comprising an easy, practical system of Estimating Materials and Labor for Carpenters, Contractors and Builders.

A comprehensive guide to those engaged in the various branches of the building trades.

By I. P. HICKS.

160 Pages. - 114 Illustrations.

Bound in Cloth, Price, - $1.00

This book presents to the trade, first, an easy, practical system of estimating materials, in concise form for reference. In the next place is given the average day's work of all kinds, and the average rates on which to figure in almost every detail of building construction.

Material and Labor, including Lumber, Carpentry Work Masonry, Plastering, Hardware, Painting, etc., are among the principal divisions. These in turn are illustrated and ably treated under numerous sub-divisions, showing step by step the entire work of estimating, contracting and building, together with the best and most practical methods of doing the work.

This is followed by a section given to the Geometrical Measurements of Roof Surfaces, with numerous illustrations and examples. It embraces a new and simple system of framing curved roofs, also the simplest methods of roof framing of every description, with practical examples thoroughly illustrating nearly every conceivable form of roof and showing many points never before presented.

The volume also contains a chapter on Mitering Planceers, Moldings, etc., illustrating and describing how to make, in an easy, practical manner, many joints which are the source of no little trouble and annoyance on the part of the workman.

SENT POST-PAID BY

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade St., N. Y.

— THE VERY LAST.—They sat in the twilight and talked of the past.

"Hiram," she was saying, "just 20 years ago to-night I first became aware that you had kindled a flame in my heart."

"Yes, Anastasia."

"That," she mused reflectively, "was about the last kindling I know of your doing, Hiram."

He did not speak for a long time. When he did, it was concerning something else. —*Detroit Journal.*

For

SHEET METAL

SKYLIGHTS,

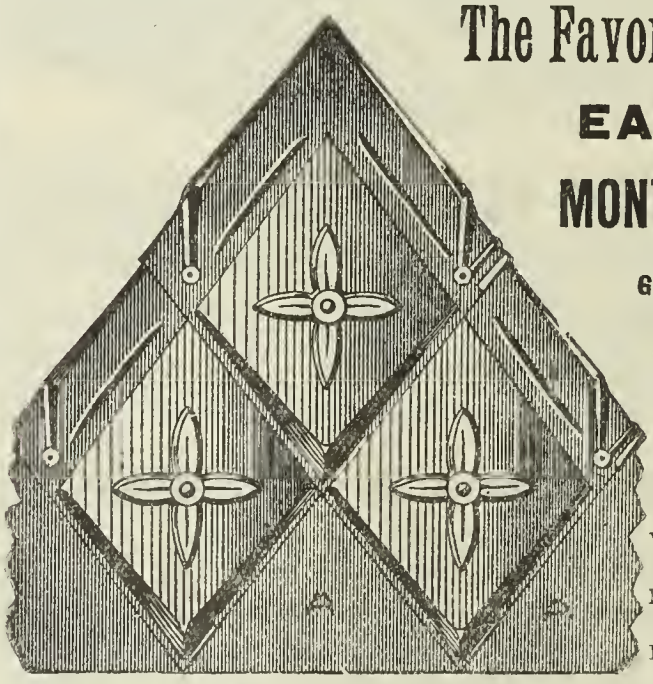
Get prices from

James A. Miller & Bro.,

129 and 131 South Clinton St., Chicago.

They think that for a good skylight they can make a little lower price than can any of their competitors.

Catalogues and prices on application.



The Favorite Metal Shingle

EASTLAKE.

MONTROSS PATENT.

Gothic and Diamond Tile.

Unequaled for beauty and excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit Mich.

MONTROSS METAL SHINGLE CO., Camden, N. J.

E. VAN NOORDEN & CO., Boston, Mass.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, - - EASTON, PA.

Architectural
Sheet Metal
Work.

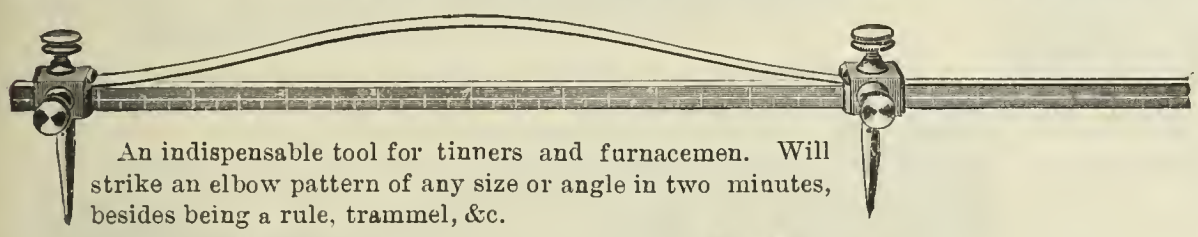
Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.



An indispensable tool for tinners and furnacemen. Will strike an elbow pattern of any size or angle in two minutes, besides being a rule, trammel, &c.

"MAGIC" PATTERN RULE.

Price Reduced to $3.50 Net Cash.

Complete with Chart. Will pay for itself in a short time.

Send for Descriptive Circular.

LUFKIN RULE CO.,
SAGINAW, MICH.

You can get everything in the line of Sheet Metal Goods from us.

PRICES WAY DOWN.

Steel Roofing, Corrugated Iron.

Galvanized Steel Eave Trough, Corrugated Expanding Conductor, Galvanized Cornice, Ornamental Crestings, Finials, Etc.

DOWN! DOWN! GO PRICES. WRITE US QUICK.

J. H. ELLER & CO., Office, 194 E. Fifth St., CANTON, OHIO.

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING : SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC. QUARRIES, BANGOR, PA. NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE Kitchen Sinks, Laundry Tubs, Washstand Tops, Marbleized Shelves, Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also Mantels.

FAIRHAVEN, VERMONT.

SEND FOR CATALOGUE.

When Painting Roofs,
When Painting Stacks or Boiler Fronts,

use Dixon's Silica-Graphite Paint and you will never regret it. Roofs well painted have not required repainting in 10 to 15 years. Graphite paint is equally useful for wood or metal. Send for circulars.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

THE ROOT & BARRON

ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer,
PALMYRA, NEW YORK.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York.

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds.

— ROBBY: "Mamma, if Santa Claus is such a good man, why does he give so many more presents to rich children than he does to the poor ones?"

MOTHER: "Because it takes so much more to please a rich child than it does a poor one, my son."—*Judge.*

— "NEVER," she said, haughtily, "never darken my doors again."

He stood before her humbly, and would have spoken, but she silenced him with a wave of her bejeweled hand, and went on:

"I told you in the first place that I wanted them doors painted a robin's-egg blue, and here you've went and grained them. I know what I want, and I'm goin' to have it."

Wearily he got out his putty knife and sandpaper and began to rectify his error. —*Indianapolis Journal.*

Uncle Sam's Flags.

Before a man of-war is completely equipped she must be supplied with a varied assortment of the flags of all nations. The flag lockers of a cruiser like the "New York" will contain more than two hundred different ensigns.

All the flags for our navy are made in the equipment building at the Brooklyn Navy Yard. The floor of the flagroom is covered with lines representing the exact measurements of the various ensigns, and it is no easy matter to turn out a flag which will be exactly according to pattern, both as to design and measurement.

There are eight colors used in flags—red, white, blue, orange, yellow, green, brown, black and canary yellow.

The canary yellow is used instead of white in flags used for signaling. This is because it is found that, when signaling at a distance, a white flag or a device on a white ground blends with the horizon and becomes almost invisible.

The largest American flag made is called No. 1. It measures 34.86 feet in length and 13.12 feet in breadth, and is very rarely used.

The size called No. 2, which is considerably smaller, is the one generally used by warships.

Cruisers carry the stars and stripes in seven different sizes, but only the "Minneapolis" and "Detroit" fly the gigantic No. 1 size.

The most difficult flag to make is that of San Salvador. This flag requires all the colors, and Costa Rico runs it close, requiring all but brown.

Our own flag is by no means an easy one to make. The 44 stars in their blue fields have to be accurately arranged and stripes mathematically exact, according to the official pattern.

The stars are made of muslin, folded 25 times and punched out by a steel punch, which cuts a dozen or more stars at each operation.

There are used in the navy yards 50,000 yards of bunting annually, which is all made in the United States. Before being made up into flags the bunting is put to a very severe test. From each lot a sample is taken and steeped in fresh water for 24 hours. After that it is thoroughly scrubbed with strong soap and then rinsed and dried. It is then exposed to the direct sunlight for 18 hours, and if it shows no fading in color it is accepted.

The industry gives employment to a great many men and women.—*West Jersey Press.*

A Story of Lincoln.

The following story is told in a recent issue of the *Century:* The First Corps, commanded by General Reynolds, was reviewed by the President on a beautiful plain at the north of the Potomac Creek, about eight miles from Hooker's headquarters. We rode hither in an ambulance over a rough corduroy road, and, as we passed over some of the more difficult portions of the jolting way, the ambulance driver, who sat well in front, occasionally let fly a volley of suppressed oaths at his wild team of six mules. Finally Mr. Lincoln, leaning forward, touched the man on the shoulder, and said :

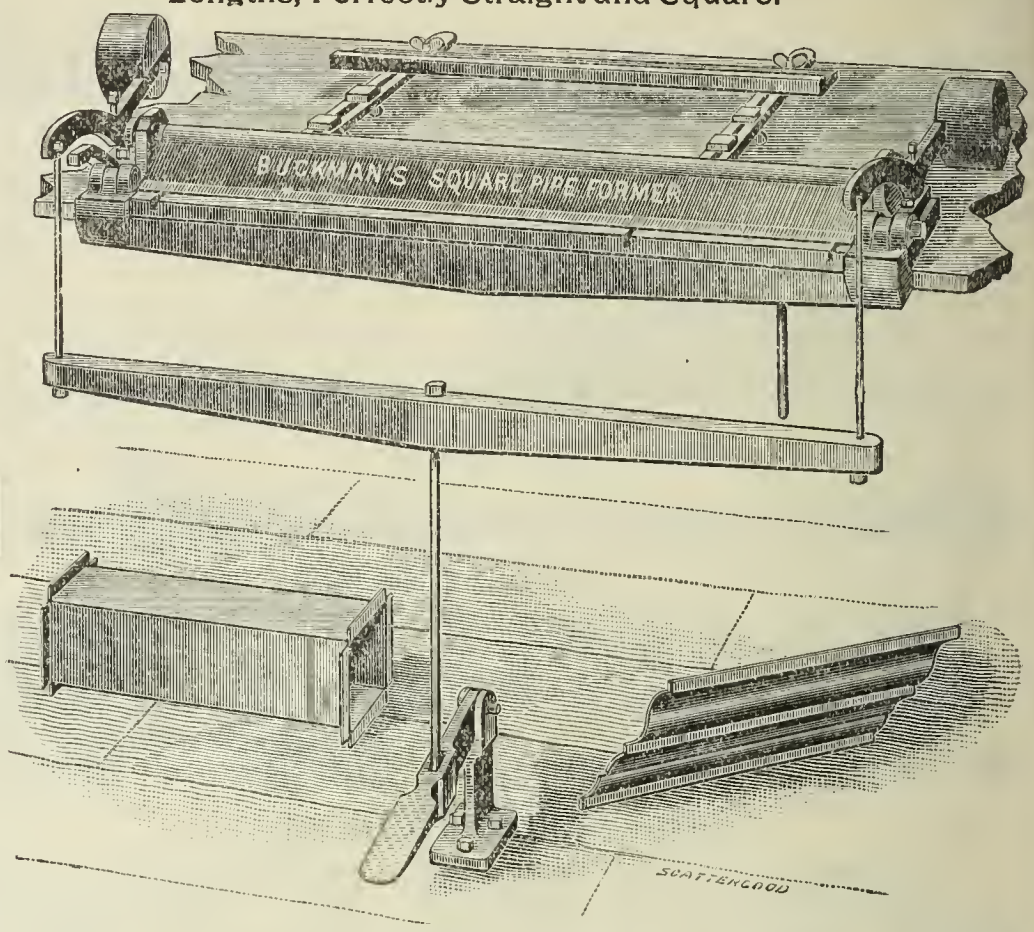
"Excuse me, my friend, are you an Episcopalian ?"

The man, greatly startled, looked round and replied :

"No, Mr. President ; I am a Methodist."

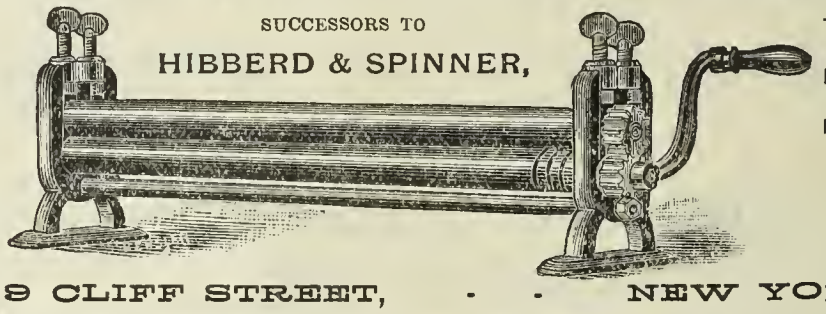
"Well," said Lincoln, "I thought you must be an Episcopalian, because you swear just like Governor Seward, who is a churchwarden." The driver swore no more.

BUCKMAN'S
—IMPROVED—
SQUARE PIPE FORMER AND CORNICE BRAKE
Will form Square Pipe, Two Inches and Larger, in Thirty Inch Lengths, Perfectly Straight and Square.



Pat'd 5-28-89.
WRITE FOR PRICES.
P. B. CALVERT & CO., PHILADELPHIA.

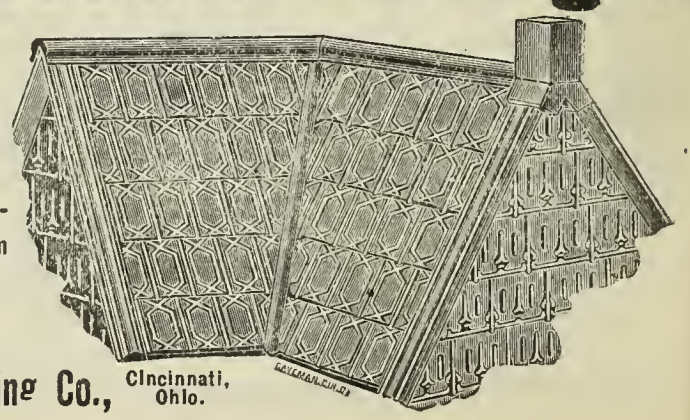
TINNERS' - MACHINERY - and - SUPPLY - CO.,
SUCCESSORS TO
HIBBERD & SPINNER,



Tinners' Tools and Machines,
Plumbers' Tools,
Cornice Machinery,
Presses, Dies and Can Makers' Tools.
FULL LINE OF SUPPLIES.
9 CLIFF STREET, - - NEW YORK CITY.

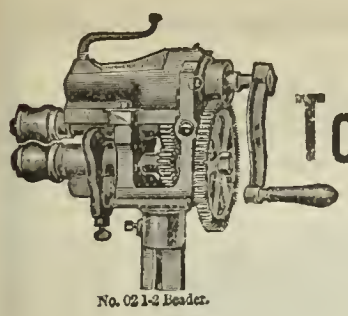
PATENT AUTOMATIC CAN BODY
SEAMERS.
COMBINATION
Presses and Dies,
SHEET METAL TOOLS, &c.
218 New St.,
W. J. GORDON, PHILADELPHIA, PA.

THE REAGAN Metallic Shingle
Absolutely water proof.
Easily applied.
Cheap.
Will last a lifetime.
Can be laid by any one.
Superior to slate and unsurpassed in appearance when laid.
Write for terms.



The Cincinnati Stamping Co., Cincinnati, Ohio.

NIAGARA


No. 02 1-2 Beader.

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

A FULL LINE.

THE BEST AND MOST IMPROVED

ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

CORNICE MAKERS' TOOLS.

PRESSES AND DIES.

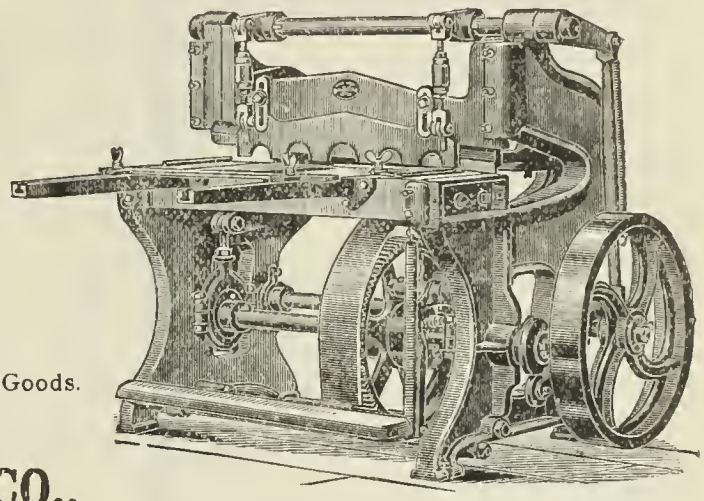
Squaring, Slitting and Circle Shears.

Complete Outfits for making Tinware, Cans and Other Sheet Metal Goods.

——MANUFACTURED BY——

THE NIAGARA STAMPING & TOOL CO.,

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**


Geared Power Squaring Shear with Gap.

Ferracute Machine Co.,

BRIDGETON, N J., U. S. A.,

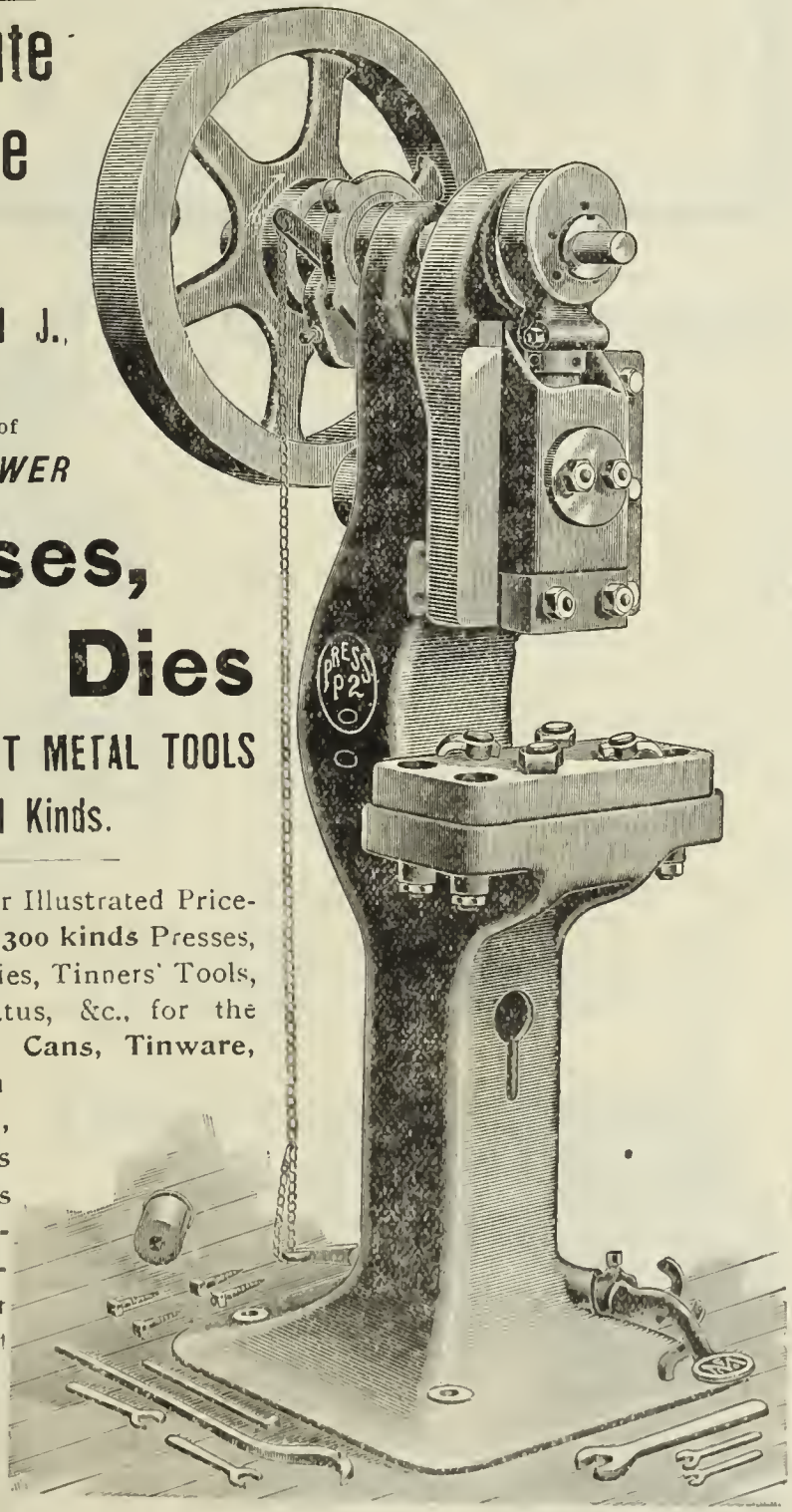
Manufacturers of

FOOT and POWER

Presses, Dies

and other SHEET METAL TOOLS of all Kinds.

Please send for Illustrated Price-Lists describing 300 kinds Presses, every kind of Dies, Tinners' Tools, Solder Apparatus, &c., for the manufacture of **Cans, Tinware, Sheet Iron Goods, Lamps, Gas Fixtures and other Brass Goods, Silver-ware, Hard-ware and other iron Goods of every kind.**



SIX SIZES OF NEW "STYLE C" INCLINABLE PRESSES, Heavy, Handsome, Durable and very Popular.

— A DILEMMA.—The Caller: "I'm all mixed up as to what to do."

Hostess: "What about?"

Caller: "I've got to get tea and a butter dish, and I don't know whether to get the tea where they give away butter dishes or the butter dish where they give away tea."—*Exchange.*

MY FAVORITE PAPER.

There's a little country paper that I love
to sit and read,
A paper poorly printed and behind the
times indeed;
With its pages small and narrow and ink
inclined to spread,
And here and there a letter gravely stand-
ing on its head.

Or caps, a bit erratic, boldly popping into
view
In unexpected places, and knocking things
askew.
A real old-fashioned paper, from my own
native little town,
Each week I hail its coming, and I never
put it down—

Till I've read its every column, all the
local news, you know,
About the dear old folks I lived with long
ago.
I note whose barn is painted, whose cattle
took the prize
And how Uriah Potts has raised a squash
of wondrous size.

How Farmer Martin's daughter takes the
school another year—
At this I pause and smile a bit and feel a
trifle queer,
Remembering how, in bygone days, when
life seemed made for mirth,
I thought this schoolma'am's mother was
the sweetest girl on earth.

And now and then, perchance, I read
that one I knew is dead,
Or find again some boyhood chum the
second time has wed;
And so it goes, and none can know what
memories sad and sweet
Come back to me whene'er I read this
homely little sheet.

— IRASCIBLE OLD GENT: "Waiter, this plate is quite cold!"

Waiter: "Yes, sir; but the chop is ot, sir; which I think you'll find it'll warm up the plate nicely, sir."—*London Tit-Bits.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

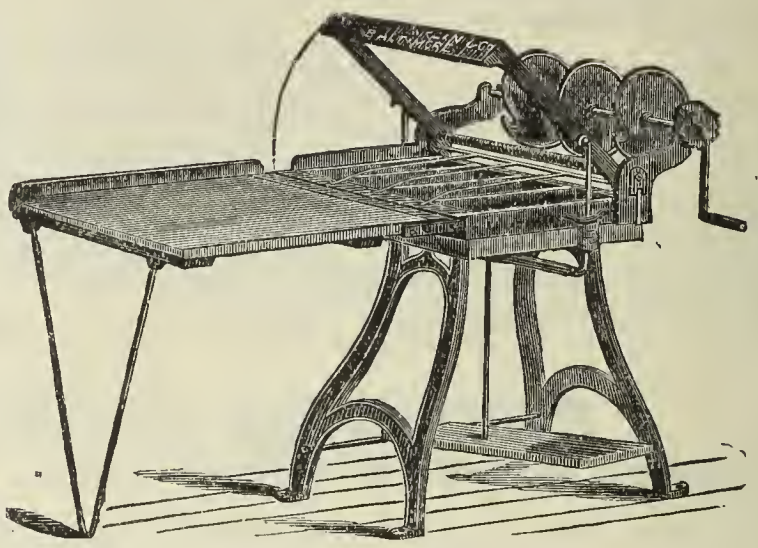
Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

First, for Rapidity of Work.
Second, for Quality of Work.
Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

LYON, CONKLIN & CO.,

Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.

—OUR—

PENDULUM PRESSES

are suitable for a wide range of work. Grooved beds with sliding bolts for holding all sizes of dies. Perfectly fitted balanced, and adjustable to light and heavy blows. A first-class machine in every respect.

MANUFACTURED BY

G. A. Crosby & Co.,

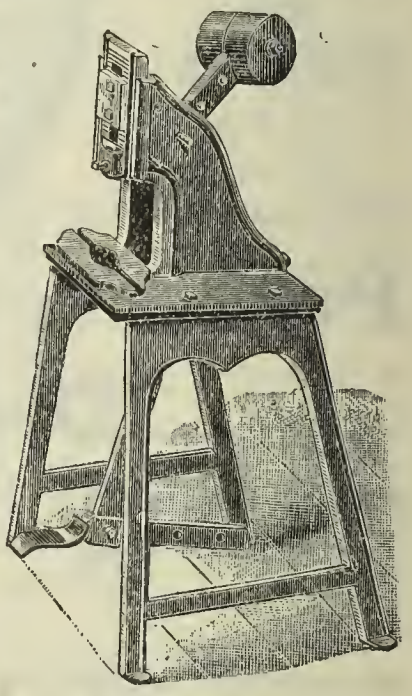
176 & 178 So. Clinton St., CHICAGO, ILL., U. S. A.,

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap Makers', and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Brass Goods and all Hardware Novelties.**

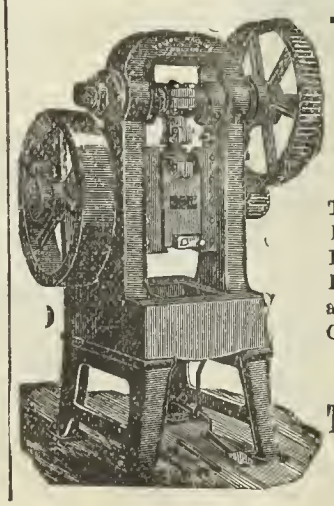
Special Attention to Dies of every Description.

WORK GUARANTEED THE BEST.



Write for Prices and New Catalogue containing full line of Tinners' Tools.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.



The Toledo Machine & Tool Co.,

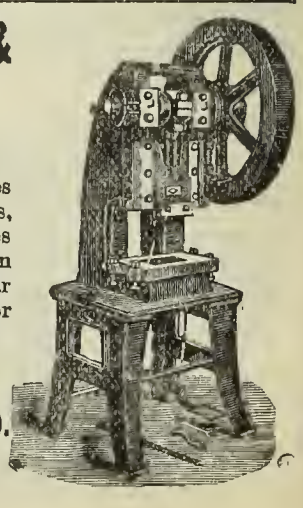
MANUFACTURERS OF

Power Punching Presses, Drop Presses Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

Send for Catalogue now being Printed.

The Toledo Machine & Tool Co.

Superior and Oak Sts., Toledo, O.



ALPHABETICAL LIST OF ADVERTISERS.

Acme Roofing & Supply Co.. 84
Ætna Standard Iron & Steel Co..... 79
Allen's Corrugating Wks... 83
American Boiler Co..... 23
American Radiator Co..... 1
American Roofing Co..... 84
American Sheet Iron Co..... 81
Apollo Iron & Steel Co 1
Armstrong Mfg. Co..... 75
Auld & Conger..... 62
Aurora Vapor Stove Co..... 12
Bailey-Farrell Mfg. Co..... 74
Bangor Excelsior Slate Co.. 86
Barstow Stove Co..... 96
Bascom, H. Clay.. 70
Belden, F. E. Mica Mining Co..... 27
Belding Mfg. Co.....28&29
Bellaire Stamping Co..... 67
Berger Bros..... 77
Berger, L. D..... 86
Bihh, B. C. Stove Co..... 25
Black Diamond Tin Plate Works..... 81
Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 31
Bowen Mfg. Co..... 30
Bowers Roofiug & Metal Wks 77
Brauer, A. G..... 70
Bridgeport Crucihle Co..... 69
Brombacher's Sons, Jacob.. 95
Bronson Supply Co..... 68
Bruce & Cook.....82&96
Buffalo Register Works..... 31
Burgess Soldering Furnace Co..... 75
Burtis, A. L..... 84
Burton, W. J. & Co 86
Calely, Ed. L..... 70
Calvert, P. B. & Co..... 88
Cambridge Iron & Steel Co.. 80
Canfield, H. O..... 77
Canton Steel Roofing Co..... 87
Carton Furnace Co..... 8
Central Oilgas Stove Co..... 7
Central Pattern Works..... 70
Central Stamping Co 65
Chamberlain, J. W. Co..... 78
Cheney, S. & Son..... 69
Chicago & Erie Stove Co..18&19
Cincinnati Corrugating Co.. 85
Cincinnati Stamping Co..... 88
Clad, V. & Sons..... 27
Clark, G. M. & Co..... 10
Clark Novelty Co..... 74
Clark, Quien & Morse..... 76
Clayton & Lamhert Mfg. Co. 72
Clough, R. M 91
Colwell Lead Co..... 78
Connecticnt Plating Co..... 69
Cooney, Seiner & Co..... 76
Cope, Geo. W..... 70
Corning Mfg. Co. 25
Correspondence School of Mechanics.. 61
Cortright Metal Roofing Co. 85
Covert Mfg. Co..... 75
Craig-Reynolds Fdy. Co..... 19
Crosby, G. A. & Co..... 90
Curtis & Curtis..... 74
Dalton-Ingersoll Co... 73
Day Mfg. Co..... 73
Dayton Mfg. Co..... 13
De Haven & Co..... 17
Deming Co..... 74
Dixon, Jos., Crucible Co..... 87
Douglas, W. & B..... 74
Dover Machine Works..... 91
Ealy, Jno. W. Co 62
Eckstein, Chas. G. & Co..... 94
Eddy Electric Mfg. Co..... 71
Electric Boiler Co..... 25
Eller, J. H. & Co..... 87
Exeter Machine Works..... 1
Fairhaven Marble & Marhleized Slate Co..... 87
Ferracute Machine Co..... 89
Ferrosteel Co..... 14
Fostoria Steel Roofing Co... 85
Frink, I. P..... 96
Friedley & Voshardt..... 84
Froelich, A., Estate of..... 69
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 87
Garry Iron & Steel Roofing Co..... 85
Gender & Paeschke Mfg. Co. 66
Gihlin & Co..... 22
Globe Iron Roofing & Corrugating Co..... 85
Globe Ventilator Co..... 70
Gobeille Pattern Co..... 70
Gordon, W. J..... 88
Gorton & Lidgerwood Co..... 1
Graff & Co..... 19
Greene, W. F 64
Green, S. & Sons..... 85
Griswold Mfg. Co..... . 64
Gummey, Spering & Co..... 79
Gurney Heater Mfg. Co..... 23
Gurney Refrigerator Co..... 30
Halliday, M 85
Hamilton, John..... 96
Hanson & Van Winkle Co... 71
Hart & Crouse..... ... 24
Hartford Hollow Ware Co . 67
Haslet, Flanagen & Co..... 69
Hess, Snyder & Co..... 27
High land Foundry Co..... 1
Highton, Wm. & Sons..... 31
Holton Iron Roofing Co..... 84
Howard Furnace Co... 32
Howard Thermostat Co..... 24
Howson & Howson..... 61
Hull, M. L..... 75
Illinois Zinc Co..... 82
Indiana Ladder Co..... 64
Iwan Bros..... 69
Jackson's Sons, W..... 24
Jenkins Bros..... 1
Jersey City Galvanizing Co. 78
Johnson, E. J. & Co 87
Kanneherg Roofing Co..... 77
Kansas City Metal Roofing & Corrugating Co..... 80
Keen & Hagerty..... 65
Keene, Geo. C. & Co..... 91
Kelly, Thos. & Bro..... 73
Kemp, C. M Mfg. Co..... 72
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 64
Kewanee Boiler Co..... 26
Kieckhefer Bros. & Co..... 65
Kieley, T..... 1
Kilbourne & Jacobs Mfg. Co. 72
Lawrence-Letts Elbow Co... 78
Lightning Dasher Egg Beater Co..... 67
Lindemann, A. J. & Hoverson Co..... 12
Lindemann, J. P. & Sons ... 27
Littleford Bros ... 83
Lufkin Rule Co 87
Lyon, Conklin & Co 90
McClure & Co..... .. . 96
McDaniel & Harvey Co..... 82
McLain, J. H. Co..... 23
McLaughlin, J. K..... 70
Mahony, M..... 27
Marcy Stove Repair Co..... 69
Marlin & Co..... 76
Marston, I. G. & Co..... 78
Mason Regulator Co..... 1
Merchant & Co., Inc..... 81
Merry, Geo. E..... 79
Menrer Bros. Co..... 83
Mica Mfg. Co..... 27
Michigan Stove Co..... 15
Michigan Vapor Stove Co... 13
Millar, Chas. & Son..... ... 96
Miller, Jas. A. & Bro.....84&86
Miner & Peck Mfg. Co..... 94
Monarch Stove Co..... 8
Montross Metal Shingle Co.. 86
Mt. Penn Stove Works 17
Mowry, W. C..... 25
Mullins, W. H..... 85
Mnnsell, E. & Co... 30
Myers, F. E. & Bro..... 74
National Wringer Co..... 66
Newark Regulator Co..... 74
New Castle Steel & Tin Plate Co..... 81
New Haven Heating & Plumhing Co..... 23
New York Central Iron Wks. 26
New York Elbow Co..... 67
New York Nickel Plating & Mfg. Co..... 67
Niagara Stamping & Tool Co. 89
Niles Mfg. Co..... 63
Ohdyke, W. A. & Co..... 76
Ohermayer, S. Co..... 69
Ohl, Geo. A. & Co 94
Osborn, J. M. & L. A..... 73
Ostrander, W. R. & Co..... 64
Packard Enameling Co..... 71
Page Boiler Co., Wm. H..... 24
Palermo Mica Co..... 27
Pancoast, Henry B. & Co.... 78
Paxson, J. W. & Co..... 69
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 74
Peck-Williamson Heating & Ventilating Co..... 4
Peninsular Stove Co.....20&21
Penn Iron Roofing & Corrugating Co..... 84
Phelps, Dodge & Co 80
Phillips Tin Plate Co..... 81
Pontyminster Old Style Ternes..... 80
Poorman Mfg. Co..... 95
Portsmouth Stove & Range Co..... 18
Presbrey Stove Lining Co... 70
Proudman Bros..... 76
Putnam Foundry & Machine Co..... 24
Rathbone, Sard & Co..... 16
Republic Iron Works, ... 83
Ringen Stove Co..... 2
Robinson, J. M. & Co. .. 95
Rochester Stamping Wks.... 67
Rome Mfg. Co..... 68
Root, A. L..... 87
Rutland Fire Clay Co..... 79
St. Louis Corrugating Co.... 83
St. Louis Stamping Co..... 68
S S. S. Conductor Co..... 77
Salem Nail Co..... 87
Sanborn, John.... 85
Saunders' D. Sons..... 75
Savill, Walls & Co..... 78
Sayre Stamping Co..... 64
Schaffer, J. P..... 26
Schneider & Trenkamp Co.. 9
Severding, John..... 73
Sheppard, Isaac A. & Co..... 1
Silver & Co 68
Sims Mfg. Co. 78
Smith & Winchester Co..... 24
Smith Co., H. B..... 26
Smith, J. D. Foundry Supply Co..... 70
Souther, E. E. Iron Co..... 80
Special Notices..... 61
Sperry, D. R. & Co..... 68
Standard Lighting Co..... 6
Star Mfg. Co..... 67
Stehbins, E. Mfg. Co..... 75
Steel Clad Bath Co..... 73
Stellwagen & Kynoch..... 31
Stiles & Parker Press Co.... 94
Stocking, E. B..... 61
Stuart & Peterson Co..... 73
Sykes Iron & Steel Roofing Co 85
Taplin, Rice & Co..... 18
Tarbox Mfg. Co..... 69
Taylor Co., N. & G..... 96
Tinners' Machinery & Supply Co..... 88
Tinplate Decorating Co..... 80
Toledo Machine & Tool Co.. 90
Troy Nickel Works..... 30
Tuerk Water Meter Co..... 94
Tuttle & Bailey Mfg. Co.... 31
United States Heater Co.... 26
Utter, Sam S..... 11
Valentine, M. D. & Bro. Co... 70
Van Noorden, E. & Co. ... 86
Vedder Pattern Works..... 70
Vogel, William & Bros..... 66
Walther & Christman..... 76
Warren Hardware Co..... 14
Washburne, E. G. & Co..... 70
Wayne, Jos. W..... 30
Weathered's, Thos. W. Sons 13
Wheeling Corrugating Co... 85
White Mountain Freezer Co. 63
Wister, L. & R. & Co... 96
Wolff, L. Mfg. Co..... 72
Wood, Alan Co..... 80
Wood Co., W. Dewees..... 96
Yates & Co..... 61
Zero Valve Co..... 75
Zucker, Levett & Loeh Co... 71

HAND POWER LEVER SHEAR.

Will shear as heavy as No. 10 Gauge Steel or Iron. Very powerful, strong and low in price.



Geo. C. Keene & Co.

Mfrs. The Keene Brake.

CINCINNATI, OHIO.

PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS, Dover, Del.

Combination Shear.

Cuts Wide Sheets 3-16 inch thick or No. 10 Gauge. Two Gauges for Slitting and Squaring.

Send for Circular and Prices to

R. M. CLOUGH, Tolland, Conn.



CLASSIFIED LIST OF ADVERTISERS.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield, H. O., Bridgeport, Conn.

Bathtubs.
Day Mfg. Co., Detroit, Mich.
Peck Bros. & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.
Stuart & Peterson Co., Phila., Pa.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N.J.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Cement.
Balley-Farrell Mfg. Co., Pittsburgh, Pa.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Collections.
Ealy, Jno. W. Co., 278 B'way., N. Y.

Conductor Pipe and Elbows.
Acme Roofing & Supply Co., Canton, O.
Allen's Corrugating Works, Chicago, Ill.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A. & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
S. S. S. Couductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford, Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Ferracute Machine Co., Bridgeton, N.J.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Corrugating Works, Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.

Cresting.
Green, S. & Son, Des Moines, Iowa.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Selner & Co., Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamtou, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Clark, Quien & Morse, Peoria, Ill.
Proudman Bros., Meriden, Conn.
Severding, Jno., Richmond, Ind.
Walther & Christman, Cleveland, O.

Egg Beaters.
Lightning Dasher Egg Beater Co., Toledo, Ohio.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Electric Dynamo Mchines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winckle Co., Newark, N.J
Zucker, Levett & Loeb Co., 8-14 Grand St., New York.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
McLeod & Henry Co., Troy, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Flour Bins and Sifters.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Foundry Facings Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Craig-Reynolds Foundry Co., Dayton, Ohio.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Peck, Williamson Heating and Ventilating Co., Cincinnati, O.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Hull, M. L., Cleveland, O.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Groovers.
Tuerk Water Meter Co., Fulton, N. Y.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.
Packard Enameling Co., Warren, O.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y.
Poorman Mfg. Co., Canton, Ohio.

Heaters, Steam and Hot Water.
American Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Fuller & Warren Co., Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
McLain, J. H. Co., Canton, Ohio.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New Haven Heating & Plumbing Co., New Haven, Conn.
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Smith Co., H. B., 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass.
United States Heater Co., Detroit, Mich.
Weathered's, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Stuart & Peterson Co., Philadelphia, Pa.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Silver & Co., Brooklyn, N. Y.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Ice Cream Freezers.
White Mountain Freezer Co., Nashua, N. H.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Lacquers and Japans.
Hanson & Van Winkle Co., Newark, N. J.

Ladders.
Indiana Ladder Co., Indiana, Pa.

Lamp Stoves and Heaters.
Central Oilgas Stove Co., Boston, Mass.
Utter, Sam S., 113 Beekman St., N. Y.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
Penn Iron Roofing & Corrugating Co., Ltd., Philadelphia, Pa.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Obermayer, S. & Co., Cincinnati, Ohio.
Smith, J. D. Fouudry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hansou & Van Winkle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand Street, New York.

Oil Cans.
Central Oilgas Stove Co., Boston, Mass.
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges, Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.
Lindemann, J. P. & Sons, Milwaukee, Wis.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Pattern Charts.
Burtis, A. L., Lockport, N. Y.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L. Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, John K., Phila., Pa.
Vedder Pattern Works, Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Plating Co., Phila., Pa.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers' Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Balley-Farrell Mfg. Co., Pittsburgh, Pa.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Claytou & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Hull, M. L., Cleveland, O.
Kelly, Thos. & Bros., Chicago, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Wolff L. Mfg. Co., Chicago, Ill.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 45 Vesey St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water.
American Radiator Co., Chicago, Ill.
Exeter Machine Works, Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reference Books.
Ealy, Jno. W. Co., 278 B'way, N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., N. Y.

Refrigerators.
Belding Mfg. Co., Belding, Mich.
Bower Mfg. Co., Fond du Lac, Wis.
Gurney Refrigerator Co., Fond du Lac, Wis.
Wayne, Jas. W., Cincinnati, Ohio.

Registers.
Buffalo Register Works, Buffalo, N. Y.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman Street, New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N.Y.
Silver & Co., Brooklyn, N. Y.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel, Corrugated and Plain.
Acme Roofing & Supply Co., Canton O.
American Roofing Co., Cincinnati, O,
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, O.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Cantou, O.
Kansas City Metal Roofing & Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
Penn Iron Roofing & Corrugating Co., Ltd., Philadelphia, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
Souther, E. E. Iron Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGE 91.

Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Lyon, Conklin & Co., Baltimore, Md.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scrantou, Pa.

Sheet Metal Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co., Toledo, O.
Tuerk Water Meter Co., Fultou, N. Y.

Shingles and Tiles, Metallic.
Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing & Corrugating Co., Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Wolff, L. Mfg. Co., Chicago, Ill.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.

Slaters' Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Steam & Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Paucoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Coun.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Pattern.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Central Pattern Works, Dayton, Ohio.
Cope, G. W., Detroit, Mich.
Goheille Pattern Co., Clevelaud, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beckman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Stellwagen & Kynoch, St. Ignace, Mich

Stoves and Ranges.
Bibh, B. C. Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
Clad V. & Sons, Philadelphia, Pa.
DeHaven & Co., Pittsburgh, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co., Boston, Mass.
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Rathbone, Sard & Co., Albany, N. Y.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Taplin, Rice & Co., Akron, O.
Warren Hdw. Co., Warren, Ohio.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.
Aurora Vapor Stove Co., Clevelaud, O
Barstow Stove Co., Providence, R. I.
Central Oilgas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill.
Dayton Mfg. Co., Dayton, O.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Michigan Vapor Stove Co., Grand Rapids, Mich.
Monarch Stove Co., Mansfield, O.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Utter, Sam S., 113 Beekman St., N. Y.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Pattern Rules.
Lufkin Rule Co., Saginaw, Mich.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Black Diamond Tin Plate Wks., Phila., Pa.
Bruce & Cook, 186 to 190 Water St, N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Gummey, Spering & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila. Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Keen & Hagerty, Baltimore, Md.
Kieckhefer Bros. & Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Acme Roofing & Supply Co., Canton, O.
Berger, L. D., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N.Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, Geo. A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - -	$1.00	SIX MONTHS, - - - - - -	$22.10
ONE MONTH, (5 Times.) - - - -	5.00	ONE YEAR, - - - - - - -	40.30
THREE MONTHS. - - - - -	12.35		

RATES FOR LARGER SPACES QUOTED ON APPLICATION.

DAVID WILLIAMS, Publisher,

96, 98, 100 and 102 Reade Street, NEW YORK. **59 Dearborn Street, CHICAGO.**

New York (Main Office), - - -	96-102 Reade Street. - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509, Hamilton Building, - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - -	HENRY SMITH, Manager.
St. Louis, - - - - - - -	Bank of Commerce Building, - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon St., London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe; or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A., The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

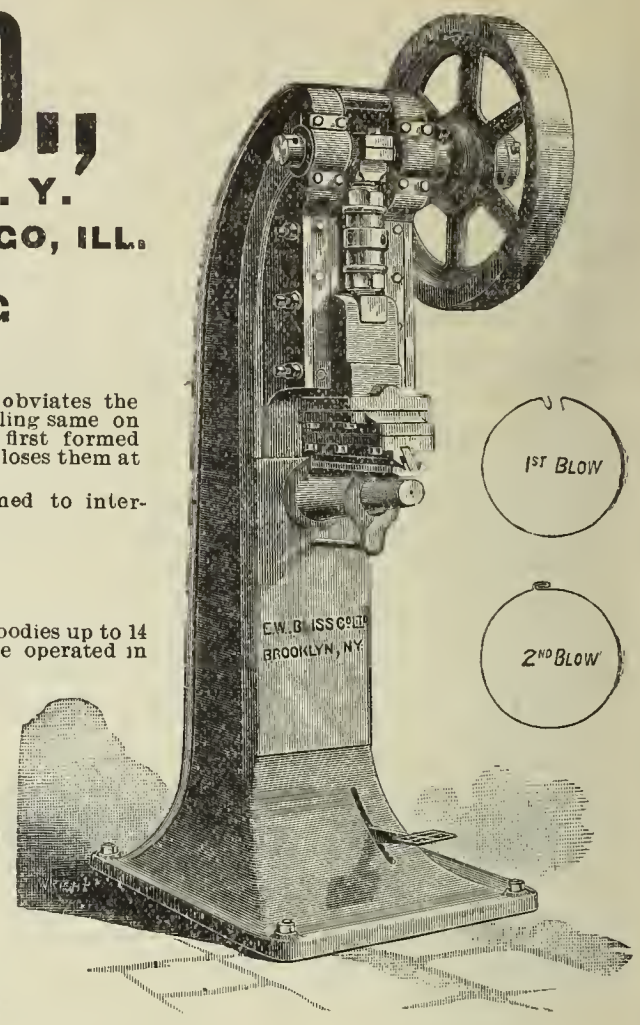
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.



PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

DIES, SPECIAL MACHINERY &c.

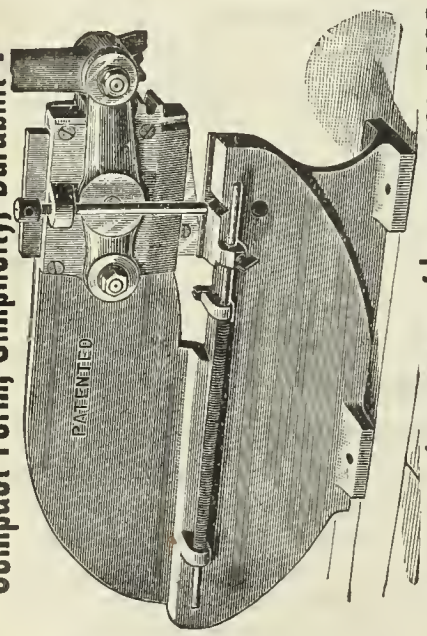
THE STILES & PARKER PRESS CO.

CHAS. G. ECKSTEIN & CO.,

45 Vesey St., New York.

Punches and Shears, Wrought Iron Ornaments, Mouldings, Rosettes, Fence Pickets, etc.

Compact Form, Simplicity, Durability.



Best Workmanship, Few Parts, Low Price.

SEND FOR CIRCULAR.

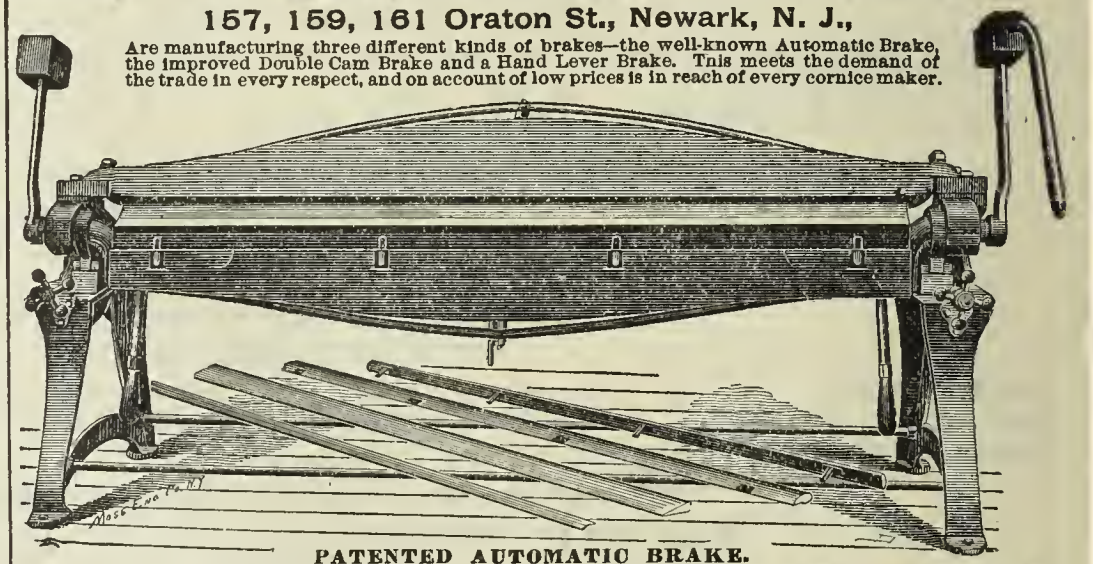


GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co.,

157, 159, 161 Oraton St., Newark, N. J.,

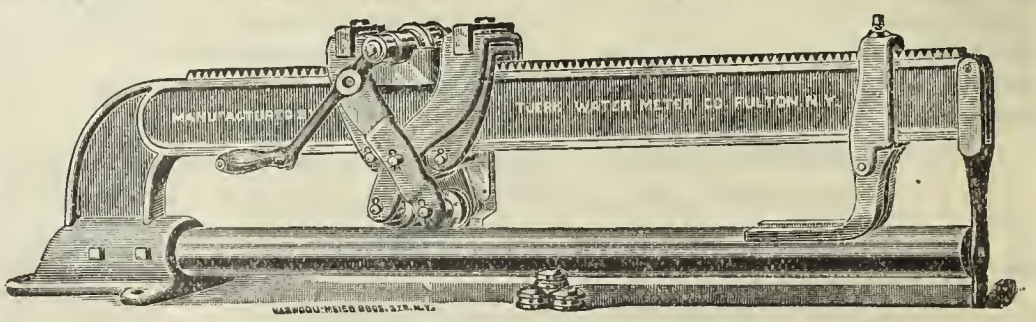
Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

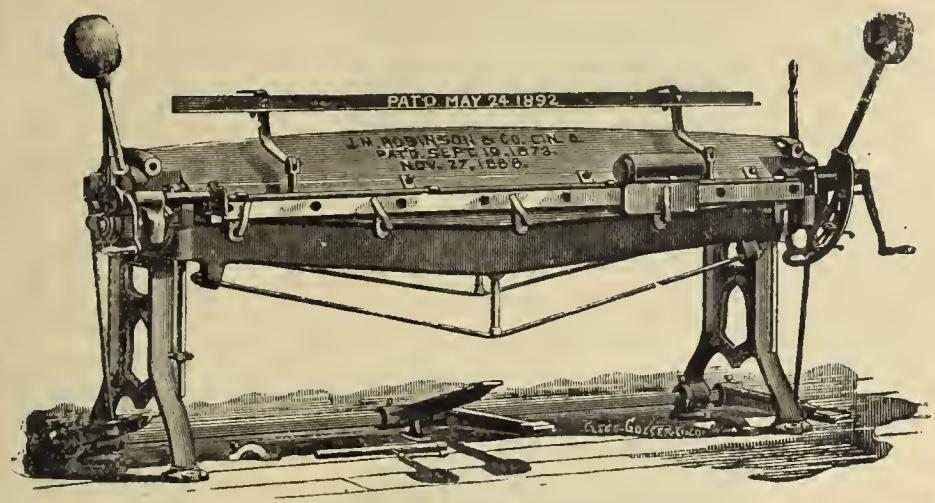
We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892 Send for our illustrated catalogue.

TUERK WATER METER CO.'S GROOVER.



SEND FOR CIRCULAR.

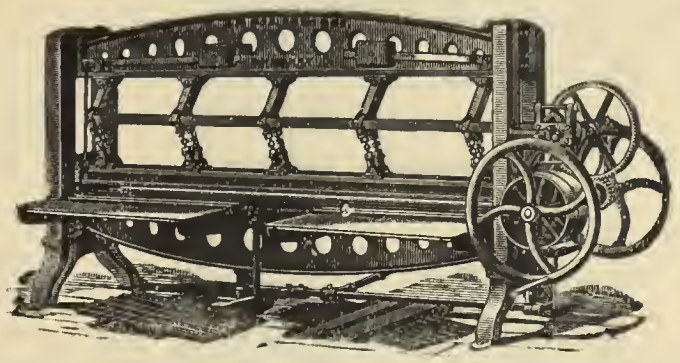
Manufactured by **TUERK WATER METER CO., Fulton, N. Y.**



ROOFING MACHINE.
With Dies suitable, will form Sheet Metal Roofing, Siding, Ceiling, Weather-Boarding, Skylight Bars, Metal Lathing, Gutters, Ridge Caps, Escalloped Steel Sheets and Cattle Troughs.

THE "GLOBE" CORNICE BRAKE.

With which to form Sheet Metal into Cornice Mouldings, Ridge Caps, Skylight Bars; and with Beader and Gutter Former attached to Brake (price of which is extra), Bead and Form Gutters. Cornice manufacturers' Steel Straight Edges, 30 inch to 10 foot lengths.



J. M. Robinson & Co., Mfrs.,

225-229 W. Second St., Cincinnati, Ohio, U. S. A.



All set up ready to use. Price, $30.00. Freight allowed to points on Missouri River.

FOR SALE BY

Hall & Carpenter.
Philadelphia, Pa.

Austin & Doten,
Boston, Mass..

and jobbers generally.

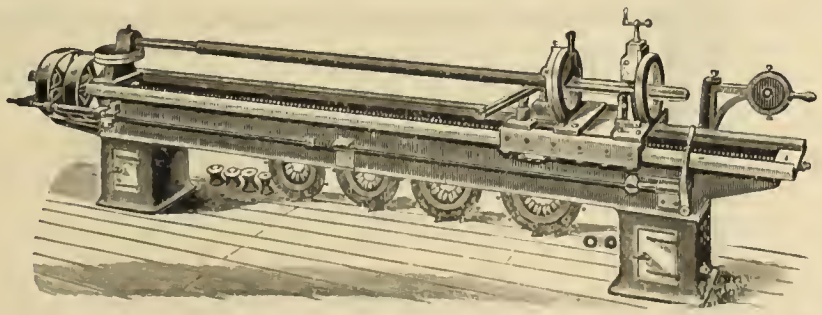
If your jobber can't supply you, order direct of the manufacturers.

SEND FOR CATALOGUE.

Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

JACOB BROMBACHER'S SONS, - No. 30 Cliff St., N. Y City.
Established 1833. Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

Sent, post-paid, on receipt of price, by

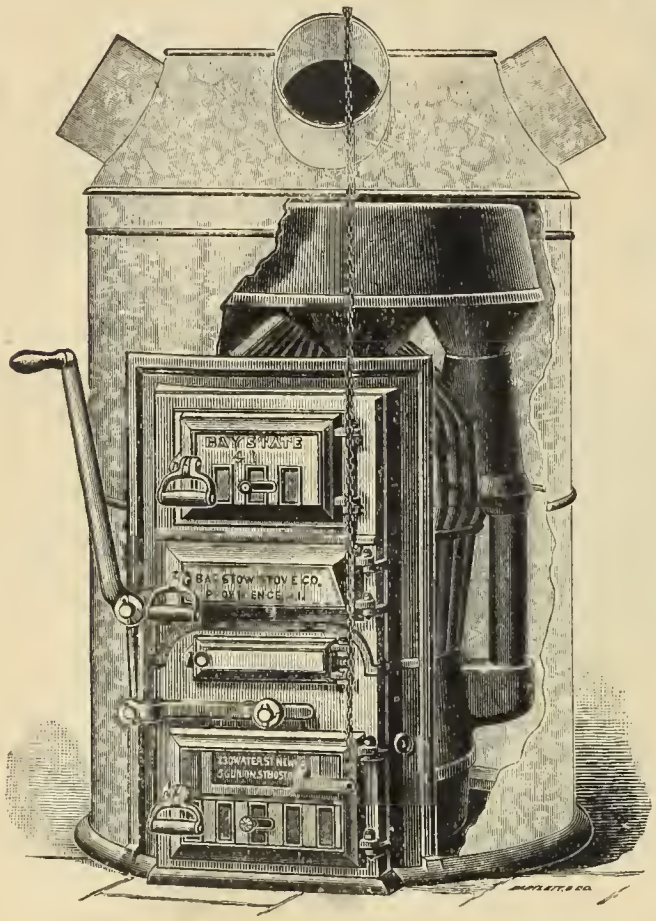
DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade Street, New York.

THE CELEBRATED

"Bay State" Furnace.

All Cast Iron, with Self-Cleaning Flues.
Adapted for Hard or Soft Coal.



Why not get our prices and send for descriptive circular?

BARSTOW STOVE COMPANY,

INCORPORATED,

BOSTON. PROVIDENCE, R. I. **NEW YORK.**

Tin for Door Linings.

12 x 24		14 x 22
13 x 26	Primes and	11 x 22
13½ x 19½	Wasters.	15 x 21
14 x 18¾	Light Weight	16 x 20
14 x 19¼	and	16 x 22
14 x 20	Full Weight.	20 x 20
14 x 21		20 x 28

Furnace Pipe Tin, IC and IX.

20 x 23	for	7	inch pipe.
20 x 26	"	8	" "
20 x 28	"	8	" "
20 x 29½	"	9	" "
20 x 32½	"	10	" "
20 x 38½	"	12	" "

ORDERS FILLED PROMPTLY.

N. & G. TAYLOR CO.,

Manufacturers of Tinplate,

PHILADELPHIA.

THE GREAT CHURCH LIGHT
FRINK'S PATENT REFLECTORS
AND FIXTURES OF EVERY DESCRIPTION
FOR LIGHTING CHURCHES, HALLS AND PUBLIC BUILDINGS WITH OIL OR GAS ELECTRICITY
SEND DIMENSIONS AND STATE WHAT YOU WANT FOR ESTIMATE
I. P. FRINK 551 PEARL ST. N.Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

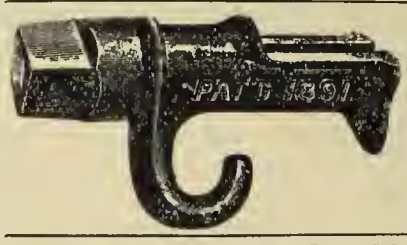
Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK,

TINNERS' TOOLS and MACHINES, TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOOK.

By far the best Spout made. Greatly improved this season. More used every year than all others combined. Sold by leading jobbers everywhere, and to them by

CHARLES MILLAR & SON, Utica, N. Y.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY.

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON.

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. Also WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh, Pa.

HAMILTON'S

BEST RE-DIPPED AMERICAN ROOFING TIN

—o— IS THE VERY BEST TIN MADE.—o—

The very best American Soft Steel thoroughly cleaned, then Dipped and Re-Dipped by hand through Pure Palm Oil until it has the thickest even smooth coat of any tin ever made in Europe or America.

MORE DURABLE TIN CANNOT BE MADE.

It is the Best Roofing Tin possible to make. This is what Hamilton's Tin has been found to be by all users. Acknowledged the best by others who claim their plates to be "as good as Hamilton's."

Plates are stamped, re-squared and guaranteed by the manufacturer,

JOHN HAMILTON,

62-64 Third Avenue, **PITTSBURGH, PA.**

McCLURE'S REDIPPED

ROOFING TIN.

AMERICAN MADE.

The finest and heaviest coated Roofing Tin made; guaranteed to contain **35 lbs. Coating** per 112 sheets.

A very important point in a Roofing Plate is to secure a uniform coating; **McClure's Redipped** is made by a process by which the coating is distributed **evenly over the sheet,** leaving no thick edges which are found on other "OLD STYLE" or "REDIPPED" plates, and which interfere to a great extent in working the sheets.

McClure's Redipped has been thoroughly tested and found to be of **superior quality** to any other "OLD STYLE" or "REDIPPED" plate made. A sample box will substantiate our claim.

McCLURE & CO., Pittsburgh, Pa.

Index to Reading Matter, Page 53.

Index to Advertisements, Pages 87 - 89.

The Metal Worker

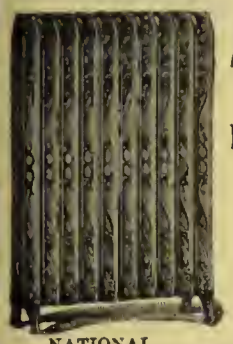
A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

VOL. XLIII. NUMBER 7.

NEW YORK AND CHICAGO, FEBRUARY 16, 1895.

ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



NATIONAL.

AMERICAN RADIATORS (TRADE-MARK.) BEST ON EARTH.

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

111 and 113 Lake Street, CHICAGO, ILL.

New York. Centre St. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F W Co.

GUARANTEED STOVES FURNACES RANGES & HOT-WATER HEATERS.

FULLER & WARREN CO. TROY N.Y.

HOT AIR PARAGON FURNACES

ISAAC A. SHEPPARD & CO. MANUFACTURERS PHILADELPHIA, PA. AND BALTIMORE, MD.

SIX POINTS

1. FEWEST JOINTS. 2. EQUALIZED DRAFT
3. LARGEST RADIATING SURFACE
4. ABSOLUTELY SELF CLEANING
5. BALL BEARING GRATE
6. PERFECT ADAPTABILITY TO ANY KIND OF FUEL.

OUR FURNACE BOOK "HINTS ABOUT HEATING" MAILED FREE IT WILL INTEREST YOU. IT MAY HELP YOU

The Apollo

iron is flat and soft enough to bear usual bending. Not sometimes; not generally; it is so nearly all alike that we warrant it all alike.

To warrant it so does not make it so. If a sheet buckles or breaks we can take it back and send you another that don't; or any number of sheets. This is what we mean by guaranteeing Apollo Galvanized Iron.

Apollo Best Bloom is the trade mark.

APOLLO IRON AND STEEL COMPANY

Pittsburgh Pennsylvania

WORKS AT APOLLO

Write for new telegraphic code.

HIGHLAND RANGES, HEATERS and STOVES

HIGHLAND FOUNDRY CO., BOSTON, - MASS.

SECOND EDITION.

"Kitchen Boiler Connections."

A Selection of Practical Letters and Articles

—RELATING TO—

Water Backs and Range Boilers.

Compiled from *The Metal Worker*.

71 Illustrations.

A Practical Helper. Price, $1.00.

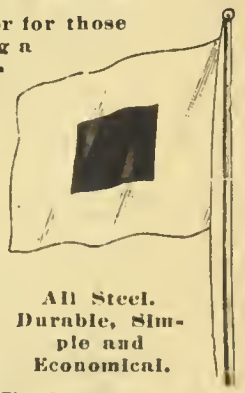
DAVID WILLIAMS, PUBLISHER,

96-102 Reade St., New York.

The COLD WAVE FLAG

Has no terror for those using a

FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.

EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO., Boston, Mass.



Have you ordered those Valves? No, not yet. What kind of Valves shall we order? What was used in No. 4 Mill? JENKINS BROS.' Have they caused you any trouble? No! Then order the same and have all future orders read JENKINS BROS.' VALVES By making a study of the Valve business we are enabled to say to users that they can get more satisfaction from the above Valves than from any other make. We guarantee all Valves with Trade Mark like cut stamped on the body

New York. Chicago. JENKINS BROS. Philadelphia. Boston.

STEAM SPECIALTIES.

Pump Governors.
Steam Traps.
Steam & Water Reducing Valves.
Noiseless Back Pressure Valves.
Damper Regulators and Oil Separators.
Send for Circulars.



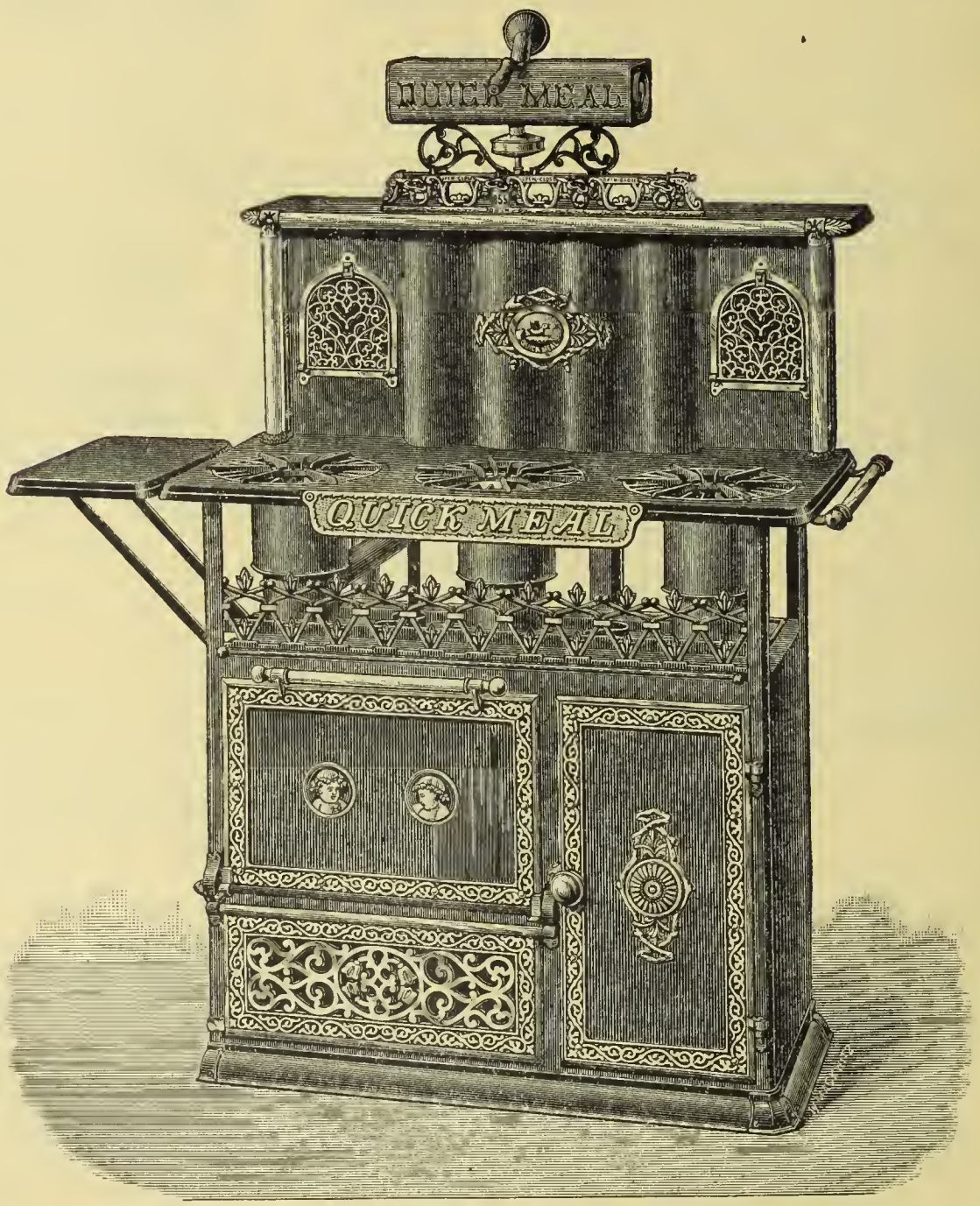
T. KIELEY, 7 to 11 W. 13th St., New York. Pressure Regulating Valve

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

ST. LOUIS.

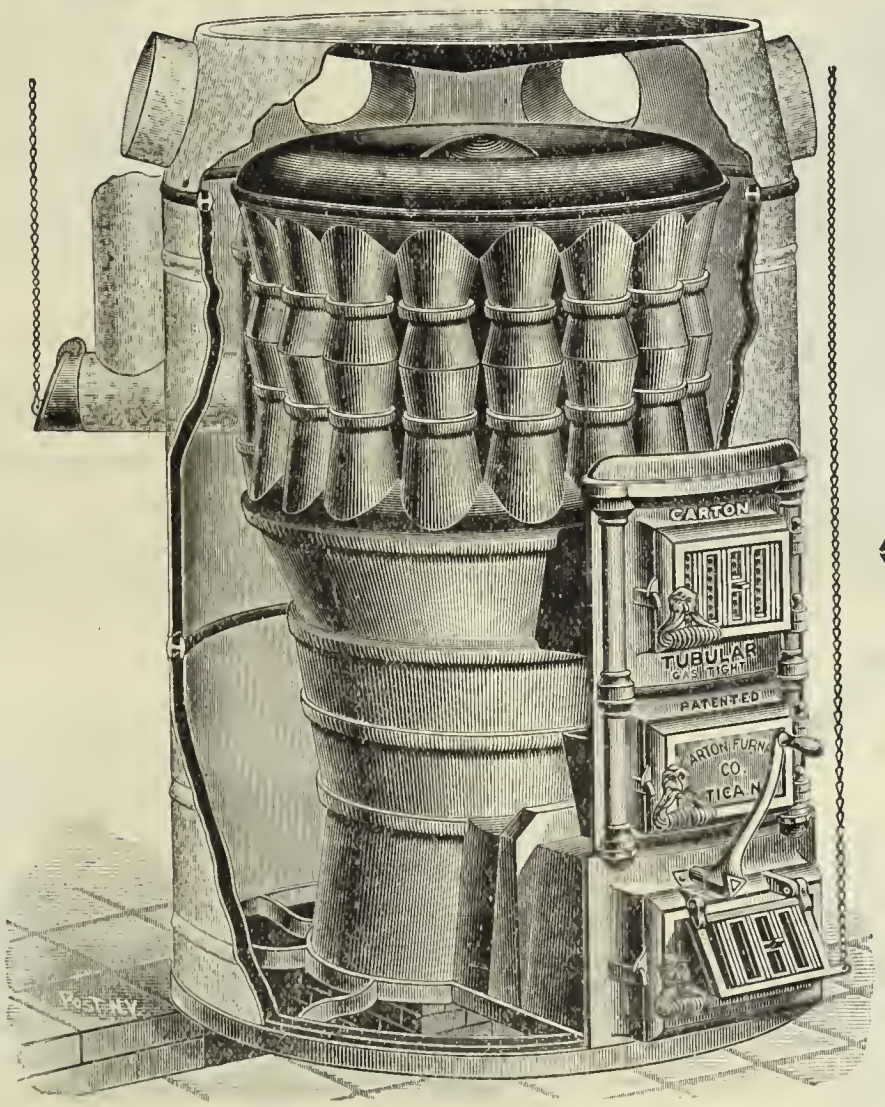
Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

Hot Water & Steam Boilers & Furnaces.

OUR TUBULAR.

SEVEN
—SIZES.—
20 to 33 Inch
Fire Pots.



12,000
to
—: 100,000 :—
Cub. Ft.
Capacity

Large amount of SHARP Radiating Surface. Self-Cleaning VERTICAL Combustion Flues with Return Back Flue.

A SIDE DRAFT Furnace. NO Bolts, SOLID and DURABLE.

OUR CATALOGUE AND PRICES WILL INTEREST YOU.

MANUFACTURED BY

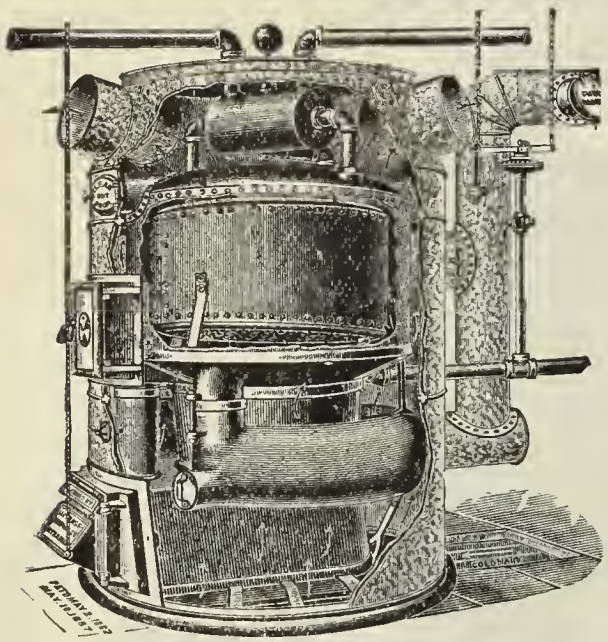
Carton Furnace Co.,

UTICA, N. Y.,

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

VAN'S Plantation Ranges.

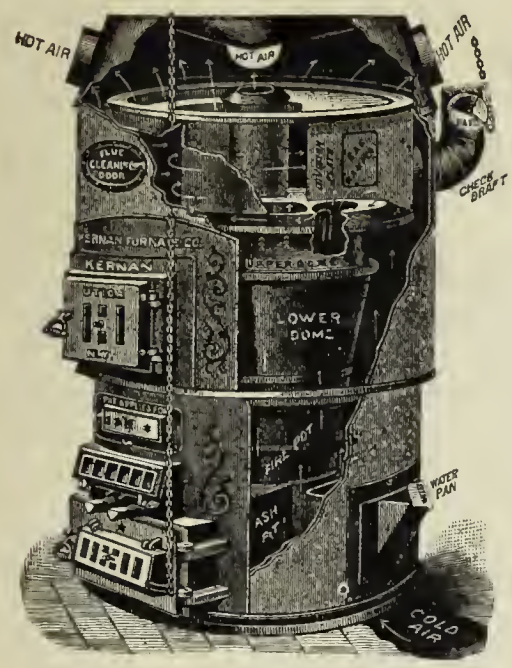
With Broiler Attachment.

The finest, most convenient and best family range ever offered for soft coal, wood or natural gas. Write for our prices before buying elsewhere. It will pay you.

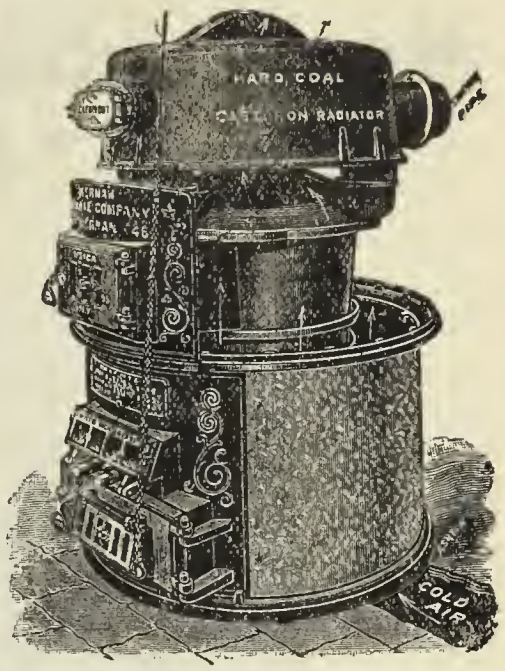
THE
JOHN VAN RANGE CO.,
Mfrs. of Wrought Steel Ranges, all sizes, and styles,
Cincinnati, Ohio.



KERNAN



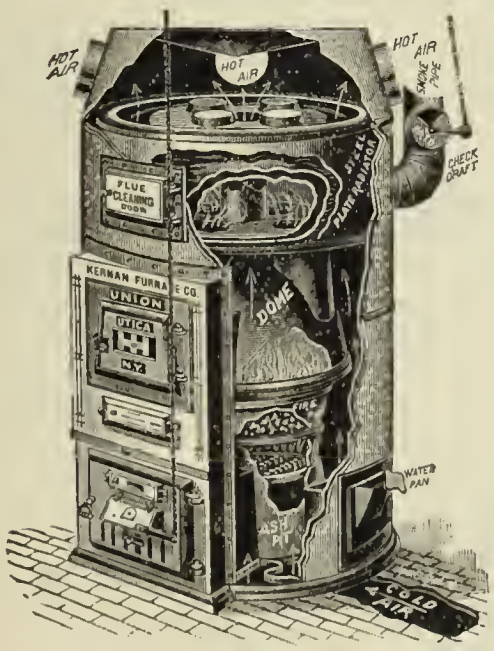
Heavy Grade Hard Coal Furnaces. *Especially* adapted for Large Dwellings, Public Halls, Schools and Churches.



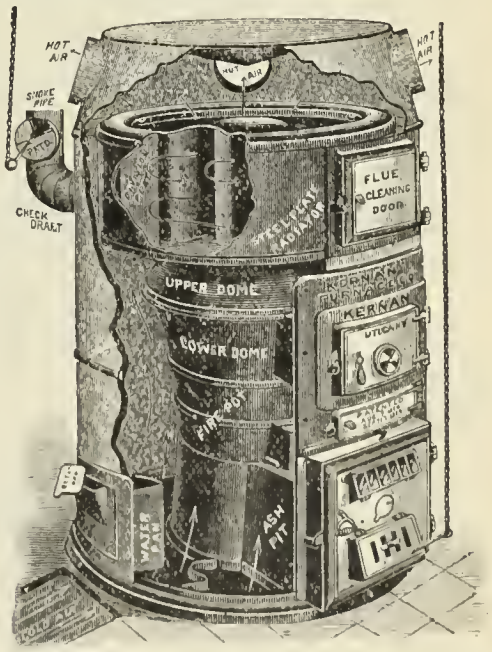
Made in Four Sizes, with 42 to 60 inch Casings.
With Steel Plate or Cast Iron Radiators.

Warm Air Furnaces,

BRICK SET——or——PORTABLE.



A Lighter Grade Hard Coal Furnaces. *Especially* adapted for Smaller Dwellings. *Economical and Durable.*



Made in Six Sizes, with 28 to 51 inch Casings
With Steel Plate or Cast Iron Radiators.

Kernan Furnace Co.,

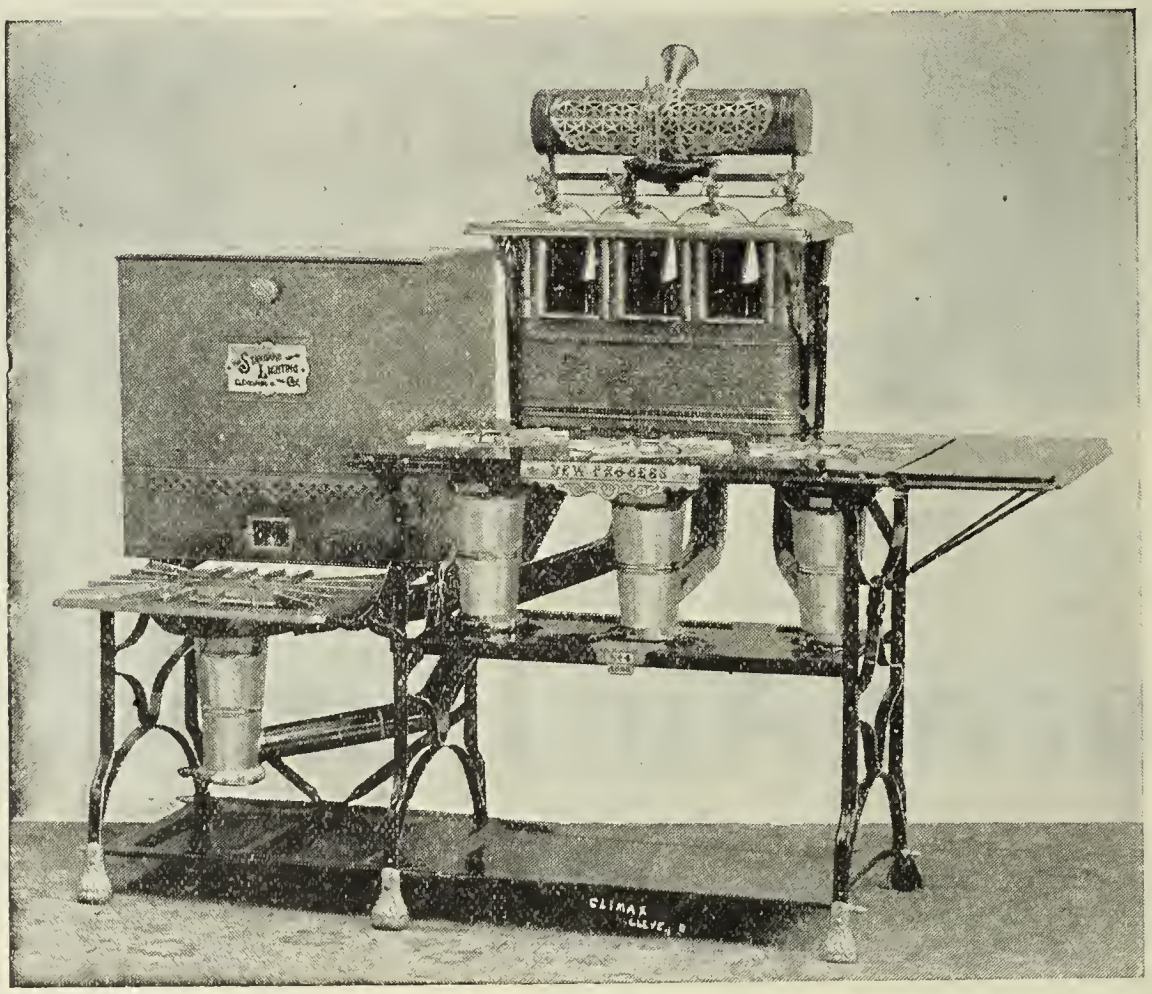
CHICAGO, ILL. **UTICA, N. Y.**

A Good Baker—A Record Breaker.

A HOME MAKER!

No Wonder 'tis such a "Taker."

The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

—MADE ONLY BY—

THE STANDARD LIGHTING CO.,

CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La.
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
Milton Rogers & Sons, Omaha, Neb.

IMPORTANT ANNOUNCEMENT.

TO OUR PATRONS AND THE TRADE GENERALLY:

Our new Catalogue for 1895 will be ready for distribution within a few weeks. We take this means of announcing in advance of its publication that we have very carefully studied the requirements of the trade in every particular, and that our lines will be complete. We will place on the market specialties in entirely new goods that will commend themselves both by reason of popular prices and their many attractive and desirable features. In addition to our very popular Oilgas Cook Stoves, containing our improved 1895 Burners that are giving such perfect satisfaction, we have something entirely new in the line of special Lamp Stoves at special prices; also Sheet Steel Circular Burner Oil Cook Stoves. Write for further information and prices.

CENTRAL OILGAS STOVE COMPANY,

—Manufacturers of—

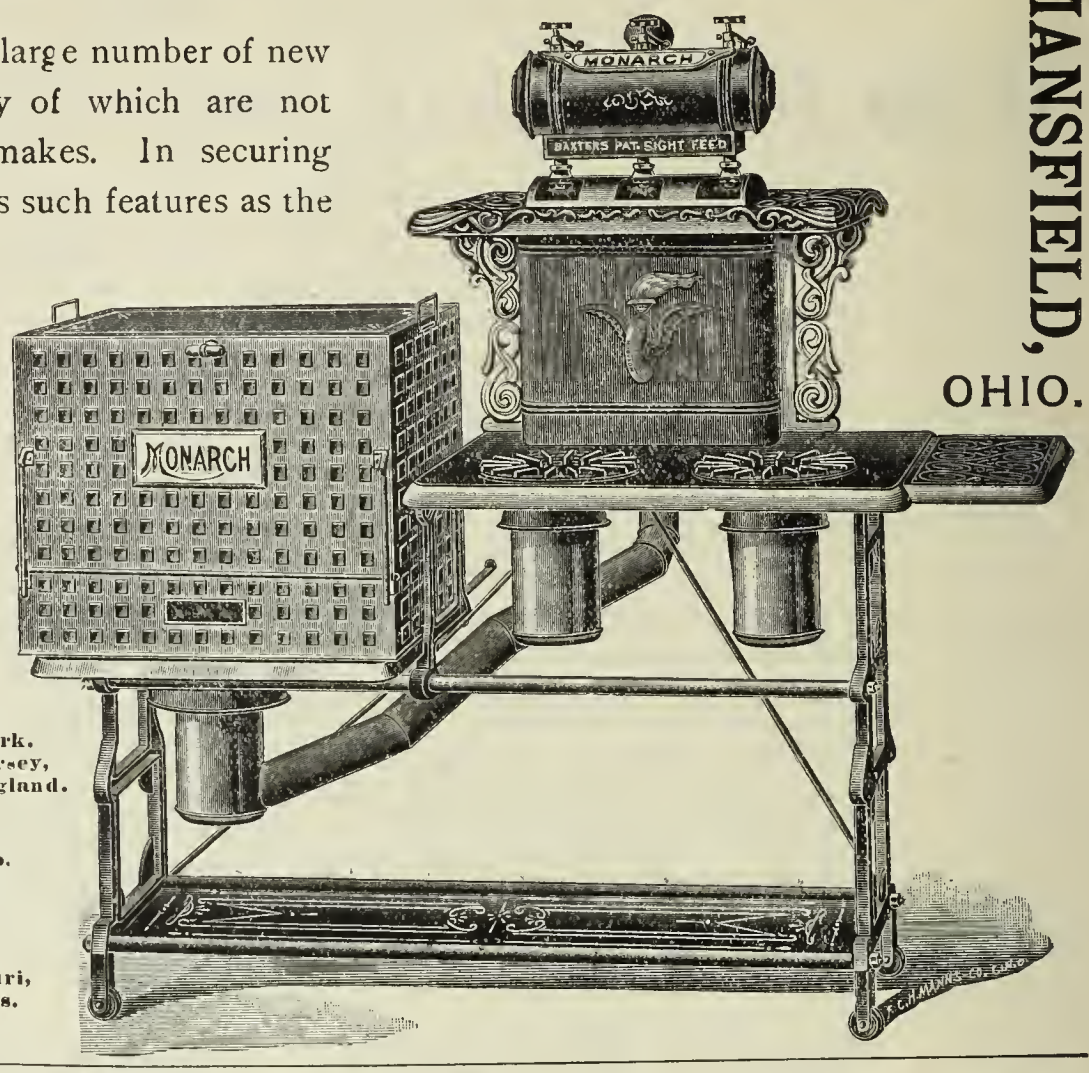
Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes.

BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.

The Monarch Stove Co.,

MANSFIELD, OHIO.

Make a Vapor Stove with a large number of new and valuable features, many of which are not found embodied in other makes. In securing the agency for Vapor Stoves such features as the Monarch possesses should be carefully considered. Send us your name and address and we will send you in return valuable literature on the use of Gasoline and Gasoline Stoves.



AGENTS,

DANVILLE STOVE CO., Danville, Pa., 284-286 Pearl St., N. Y., and 41 No. 11th St., Phila., Pa.,	Penna. New York. New Jersey, New England.
E. H. HUENEFELD, - - Cincinnati, O.,	Ky., Tenn., So. Ohio. So. Ind.
COOK RANGE & STOVE CO., Chicago, Ill.,	Wis., No. Ill.
THE ZAHNER & BATTELL MFG. CO., Kansas City,	Missouri, Kansas.
THE HALL BROS. CO., Lincoln, Neb.	

"GOVERNOR" GASOLINE STOVES "PRINCESS"

We are pleased with the prospects of the coming Gasoline season.

Since the Dealers have seen our Stoves and convinced themselves that we manufacture and carry

The Most Complete Line, the Finest Appearing and Best Working Gasoline Stoves,

Inquiries and orders are pouring in on us. This is very gratifying and at the same time nothing unusual, as the intelligent buyer will at all times avail himself of an opportunity to get the best at the same price.

And we certainly insist that our Gasoline Stove is the best in the Market.

Our Illustrated Catalogue is ready and will be sent on application.

Send for Discount and Secure Territory.



Western Stove & Mfg. Co.

MILWAUKEE, WIS.

CHICAGO OFFICE: Room 73, 88 & 90 Washington Street, T. J. DUFFY, Jr., Sales Agent.

DEALERS!

All Weak Points About Vapor Stoves

are not called to your attention by unscrupulous manufacturers or their salesmen. They often palm off imperfect and faulty stoves as perfect, and jolly you into the belief that you have struck a bargain.

But when summer comes and truth comes to light, as it invariably does in the vapor stove business, vexation and disappointment come with it. Vexation, because you have been duped, disappointment, on account of the loss of a season's profit.

Better handle a *good line* at a fair profit than a *poor* line at a *bargain* profit. There is no such thing as a "bargain," especially in the vapor stove business. *Proof*—Review the past ???

Better buy from a responsible manufacturer or his legitimate jobber, especially of one whose integrity is unquestioned, and one whose knowledge of the vapor stove business secures you an honest deal and prevents the imposition of fakes or shoddy goods. *There are a few of us left.*

Better buy a good line to be successful. A *bad* stove is a very poor purchase at *any* price.

Better look for Protection.

Protection in order to be of service to you must begin at home. See that this point is not overlooked when casting about for a line for 1895.

Better think this over.

The old adage reads, "Make Haste *Slowly*." This is a weighty proverb. The more so when you consider that the best versed manufacturers in the vapor stove industry are not offering any new inventions or innovations for the coming season.

Yours respectfully,

THE SCHNEIDER & TRENKAMP CO.,

479-501 Case Ave., Cleveland, O. 67-69 Lake St., Chicago, Ill.

Jobbers Who Will Handle the Reliable for 1895.

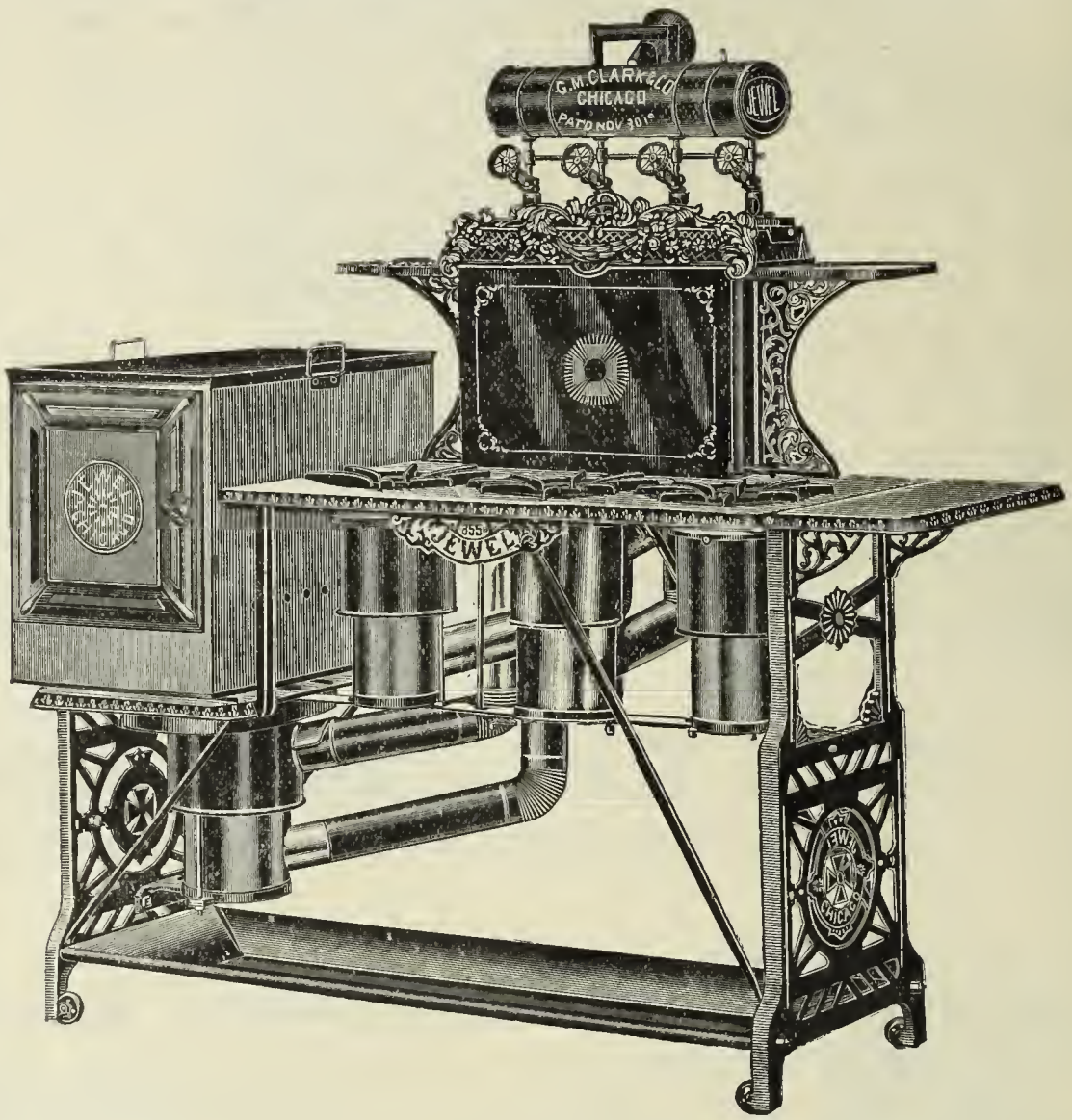
THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas and Oklahoma Territory.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F. FOX, Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N. CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.
S. FAITH & CO., Philadelphia, Pa.—Eastern Pennsylvania and New Jersey.
HUNNICUTT & BELLINGRATH, Atlanta, Ga., and Vicinity.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

CATALOG READY SOON.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
BARSTOW STOVE CO., New York, N. Y.
W. W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

Facts of Interest to the Public.



Our "PROCESS" for 1895, we can say unqualifiedly, is the

MOST PERFECT WORKING PROCESS STOVE EVER PLACED ON THE MARKET, and HAS NO EQUAL.

In calling attention to our

NEW GEM STOVE,

We offer the trade a STOVE FOR THE PEOPLE and FOR THE TIMES.

THE GEM STOVE is CONVENIENT

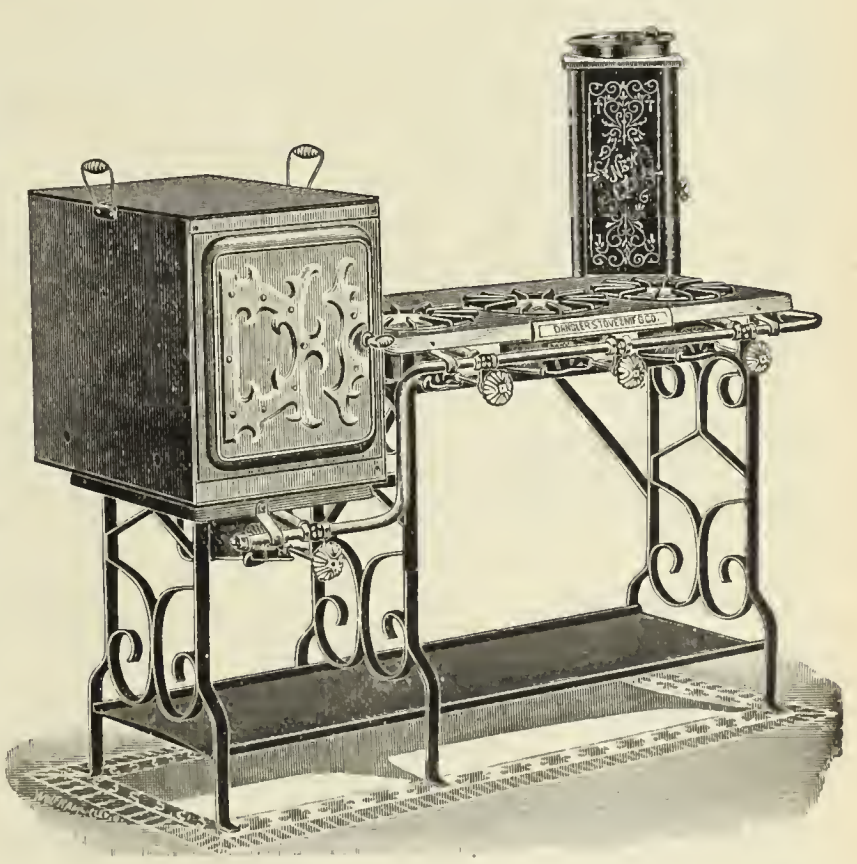
in SIZE, with the same sized flame as the PROCESS doing the same amount of work with **less fuel,** and at an original cost of only about ONE-HALF that of the regular high Stoves. This Stove is ABSOLUTELY our own, and CAN BE MADE ONLY BY US, and as pioneers in this business, the public naturally look to us for progress, while some of our competitors, who can only make the old line, call such improvements, "an innovation." Our GEM and PROCESS, together with our DELIGHT, celebrated JUNIORS, Individual and Single Generator Burner Stoves, &c., will give our trade a decided advantage over their competitors,

Write for Catalogue, 1895.

—THE—

Dangler Stove & Mfg. Co,

CLEVELAND, O.



WHOLESALE AGENTS:

E. H. Huenefeld, Cincinnati, O.
Standart Bros., Detroit, Mich.
Mt. Penn Stove Works, No. 111 N. 2d St., Philadelphia.
Mt. Penn Stove Works, Reading, Pa.
Barstow Stove Co., No. 228 Water St., New York.
Barstow Stove Co., No. 56 Union St., Boston.
Home Stove Co., Indianapolis, Ind.
Denver Stove & Hdw. Co., Denver, Colo.
J. P. Lindeman & Sons, Milwaukee, Wis.
R. Robinson & Sons, Chicago, Ill.
Richards-Conover Hdw. Co., Kansas City, Mo.
The Stollberg-Clapp Co., Toledo, O.
Weber & Gebhart, Dayton, O.
Bradley & Munk, Columbus, O.
Foster-Stevens Co., Grand Rapids, Mich
The Schaab-Puff Stove Co., St, Louis, Mo.
Dunlay & Geisler, Houston, Texas.
The Wooldridge Stove Co., Memphis, Tenn.
A. Baldwin & Co., Ltd., New Orleans, La.
M. F. Tallmage, Buffalo, N. Y.
W. E. Galbreath, S. E. cor. Lombard and Light Streets, Baltimore, Md.
The Ochsner & Orcutt Co., Sioux City, Iowa.

DEALERS

EVERYWHERE SHOULD CONSIDER THE FOLLOWING:

THEY CANNOT FAIL TO FIND SUITED TO THEIR TRADE,

Gasoline Stoves, Oil Cooking Stoves,
Oil Heating Stoves, Lamp Stoves,
and Gas Hot Plate Stoves,

Together with Full Lines of Ovens and Furniture

In the following Large Assortment of First-Class, Popular and Reliable Goods we are offering

"AURORA" Process Gasoline Stoves.

"ARGAND" Improved Junior Lines, High, Low and Step Gasoline Stoves.

"ROYAL" Round Wick, High and Low, Oil Cookers, with new and desirable features.

"ROYAL" Flat Wick, all Cast, Nickel Finish, Oil Cookers.

The Largest Line at Low Prices on the Market.

"ROYAL" Lamp Stoves, One, Two and Three Burner. — Polished Nickel Finish, Sheet Iron Chimneys, Brass Burners.

"JOCKEY" Lamp Stoves, One, Two and Three Burner. — Japan and Bronze Finish, Tin Chimneys, Cast Burners.

"SHOO-FLY" Lamp Stoves, One, Two and Three Burner. — Japan Finish, Tin Chimneys, Tin Burners.

"SHOO-FLY" Double Lamp Stoves, with Two and Four Hole Extension Tops. Mounted on Highly Ornamental Base, Finished in Polished Nickel and in Japan.
All our "Shoo-Flys" are great sellers.

GAS HOT PLATE STOVES.

Full Nickel, White Nickel and Plain Finish.

"CHAMPION" Two and Three Burner. — Special New Line, 1895. Large, Smooth Top Surface, something entirely new, stands high, and has our Removable Burner and Air Adjuster. The most common sense stove ever made.

"MAGIC" Two and Three Burner. — Special New Line, 1895. Popular priced, Large Flush Top Surface, stands high, has Double Burner and Air Adjuster.

"ARGAND" One Two and Three Burner. — Flush Top, Double Removable Burners, Beautiful Design.

"FIRE-FLY" One, Two and Three Burner. — Flush Top, Double Removable Burners, Popular Priced and a great seller.

Also New Line "ROYAL" Oil Heaters.

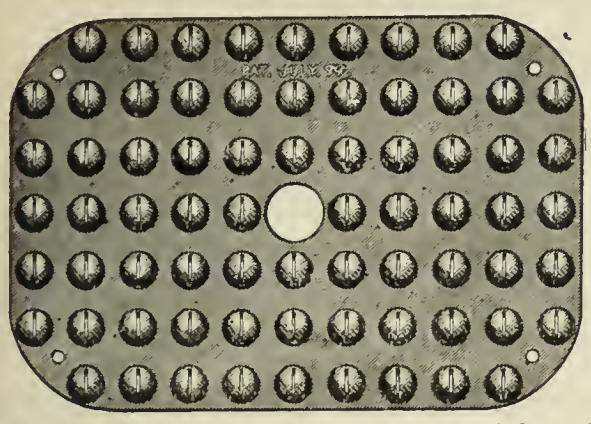
With such an assortment of First-Class, Popular and Reliable Goods to select from we believe it will pay you to see us before buying elsewhere.

THE PERRY STOVE CO.,

ALBANY, N. Y. — **242 Water St., New York City.**

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.

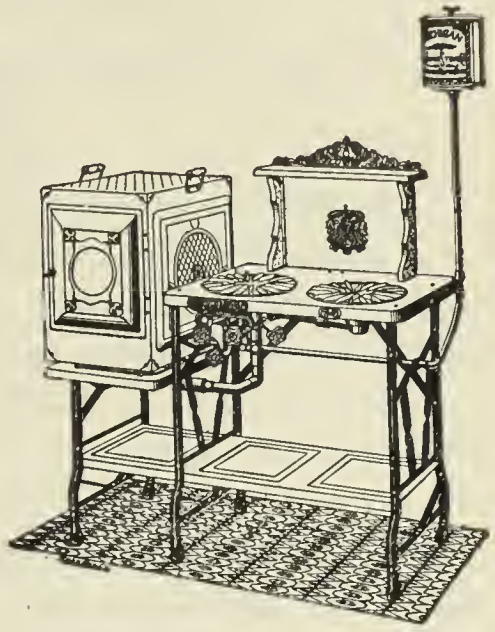


No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale*.

OUR JET CONE BURNERS distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

and

SPECIAL JUNIORS.



Simplest, Safest, Best.

Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

139, 141 and 143 CENTRE STREET, - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

Hear 'em Holler!
Oh, my! ain't it Funny?
The "combine" at last see their Waterloo.
The beginning of the end of the Vapor Stove Association.

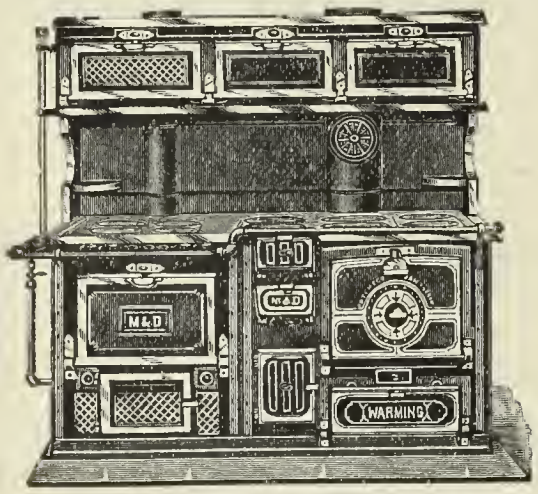
No wonder they holler, for they know not "where they are at." The L. & H. Process did it.

Dear people, don't be alarmed when you hear their noise. It is the old story of great cry and little wool. Have you read their bluff? Of course you have. Ain't it sublime? Oh, my! what a lot of advertising for us. A regular snap.

Just as soon as the dealer reads their warning he gets on his fighting clothes and at once looks into the merits of the L. & H. Process. We are deluged with orders, and are all smiles, for the trade stands by us and will not be intimidated by the "combine." We know who our friends are, and therefore congratulate ourselves. When the dealers see our L. & H. Process stove they will have no other. The "combine" know this; hence all the commotion, and all they can do is to rush into print in their efforts to stem the return of their boomerang, but it does not work and in their agony they ask themselves "how can it was?"

Buy nothing but the L. & H. Process. **We are with you. Your interests** are ours. **We are here to stay.** The **L. & H.** mark shines **brighter than ever,** for **"It's a good thing, push it along."** Hurry up and write for catalogue so you will not be left.

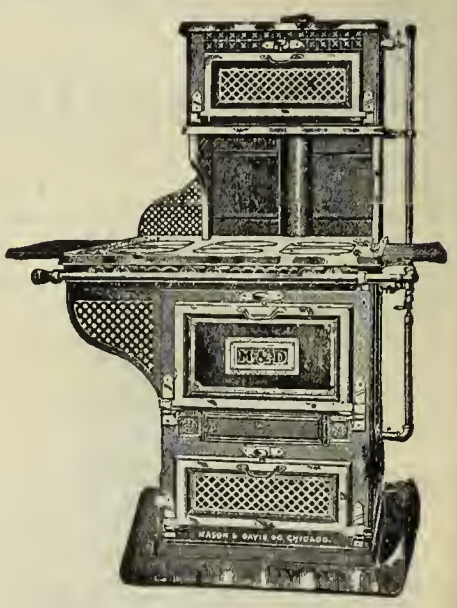
A. J. LINDEMANN & HOVERSON CO., Milwaukee, Wis.



M & D
Wrought Steel Ranges
For Coal, Wood or Gas.

150 DIFFERENT STYLES AND SIZES.

M & D
Combination Range



For Coal and Gas or Wood and Gas. Single Oven and Double Oven, Gas and Coal Ranges.

SEND FOR CATALOGUE.

MASON & DAVIS CO.,
72 LAKE STREET, CHICAGO.

Announcement of

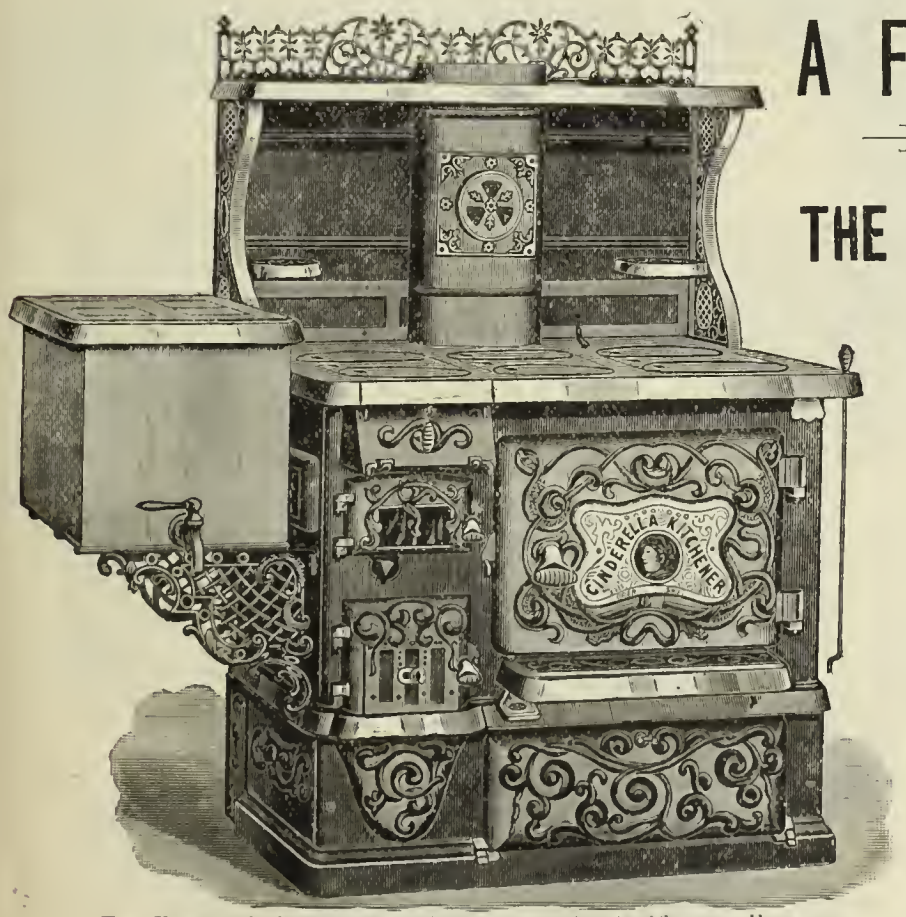
An Important Meeting to take place at Offices of

The Ferrosteel Company,

Wade Building, Cleveland, Ohio,

Monday, February 4th, 1895—And following days.

This meeting is one of orders and inquiries for Ferrosteel Ranges that will be received. Also applications for agencies. Orders from traveling representatives, too. Will your order, inquiry or agency application be received with others? It's the style now to handle Ranges made of Ferrosteel. New sizes for 1895 Spring trade.



The Reservoir is Planished Copper, and holds fifteen gallons.

A FEW WORDS
TO THE PROGRESSIVE DEALER.

THE CINDERELLA KITCHENERS

Are an entirely new series of

ALL CAST IRON RANGES,

Adapted for burning

HARD OR SOFT COAL OR WOOD.

They have embodied in their construction many new and desirable features that are thoroughly practical and will meet the approval of the "up to date" dealers. The Cinderella Kitcheners are also made with feet and skirting in lieu of the Low Closet. A full complement of High Shelves and High Closets accompany the same. Every appointment is the latest, and for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No. 716,	Oven 16 x 16,	10½ inches high.
718,	18 x 18,	11½ "
818,	18 x 18,	11½ "
719,	18 x 20,	12½ "
819,	18 x 20,	12½ "
821,	20 x 22,	13½ "
921,	20 x 22,	13½ "

IF YOU ARE INTERESTED WRITE FOR PRICES.

We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

We Would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited - - Pittsburgh, Pa.

Taplin, Rice & Company,

—Manufacturers.—

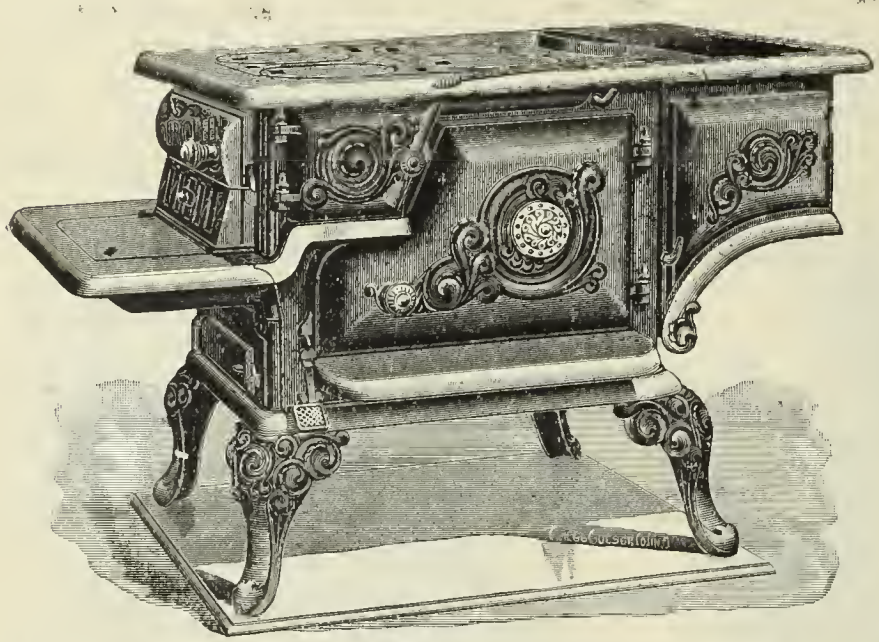
DICTATED BY P. **Akron, Ohio,** January 29, 1895.

BY THIS we beg to call the attention of the trade to the fact that during the current year we will be on the market with several new patterns of Steel Ranges and Heating Stoves, of superior construction, ornamentation and attractive form, the patterns of which are well under way and will soon be ready for the sand. The Climax Steel Range, which will be made in all the various conventional forms and styles, will be both as to construction and appearance second to none on the market. We will also have ready for the trade in due time a "Climax Air Blast" and "Climax Air Tight" heating stove] in different sizes, the constructive features of which will be a radical departure from any pattern of stove ever offered, and we feel well assured they will wherever introduced take a leading position in the line of special heaters. Cuts and prices of these Ranges and Stoves will be mailed on application at an early date, and we are confident you will feel justified in deferring your order for supplies until samples or cuts of stoves named may reach you.

With grateful appreciation of former courteous favors shown us by the trade, we remain,

Very respectfully,

TAPLIN, RICE & CO.



Our Queen.

For wood, with all latest improvements. A new stove throughout at a very low price, yet of the finest grade. Made in all the usual sizes and styles. No dealer's stock complete without a line of them. Try a sample and get on to the good points of them.

The Portsmouth Stove & Range Co.,

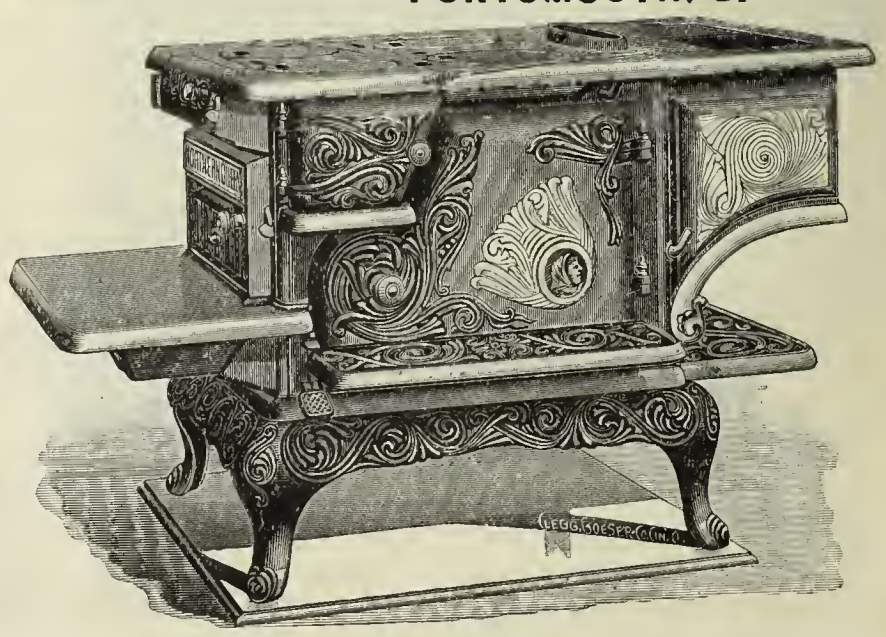
PORTSMOUTH, O.

Northern Queen.

A new Coal Cook than which none superior is made anywhere. In fact many not near as good Look at the design, the mounting is equally as high grade, while the castings are smooth and heavy. Write for Catalogue.

AGENTS:

R. ROBINSON & SONS, Chicago, for the Northwest.
A. L. CANFIELD, 284 Pearl Street, New York, for New England States.
C. F. HAKE & SONS, for Cincinnati and Vicinity.
HOME STOVE CO., Indianapolis, Ind.
W. E. ANTHONY & CO, Detroit, Mich.; Mich. and Minn.
BRADLEY, MUNK & CO., Columbus, Ohio.



---

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.

THE DAWN OF PROSPERITY.



WILL. H. BRADLEY, DES.

It has been said that in America TWO CLASSES of Stoves and Ranges are sold, viz.: . . . . . "GARLANDS" and OTHERS.

At the very HEAD and FRONT of the "Others" stands our new line of . . . "MICHIGAN" Stoves and Ranges,

Which are unquestionably the latest, handsomest and most artistically-designed Stoves and Ranges to be found upon the market at anyth'ng like the price at which they are sold.

They are made under our own supervision; by same workmen and out of the same material from which "Garlands" are made, and this fact of itself should be sufficient to cause them to be preferred by discriminating merchants and consumers, as against all other brands, excepting the invincible line of "Garlands."

ESTABLISHED 1850.

THE

THATCHER FURNACE CO.,

No. 240 Water Street, New York.

ANNOUNCEMENT.

We Sold More Furnaces in 1894 than ever before.

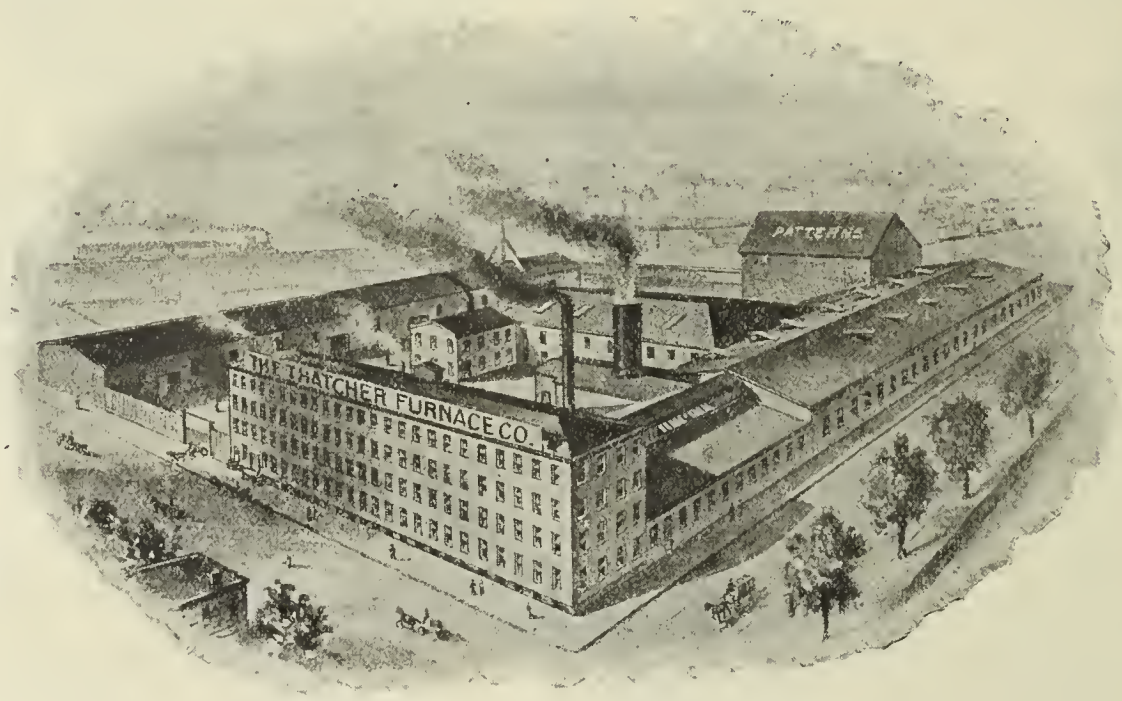
We Sold More Ranges in 1894 than ever before.

We Sold More Steam and Hot Water Heaters in 1894 than ever before.

Our business continues to increase because we give good value. The trade appreciate good goods. The public appreciate the trade handling good goods. This in a nut shell is why our trade is rapidly increasing.

"Thatcher" Tubular Furnace.

"Scorcher" Furnace.



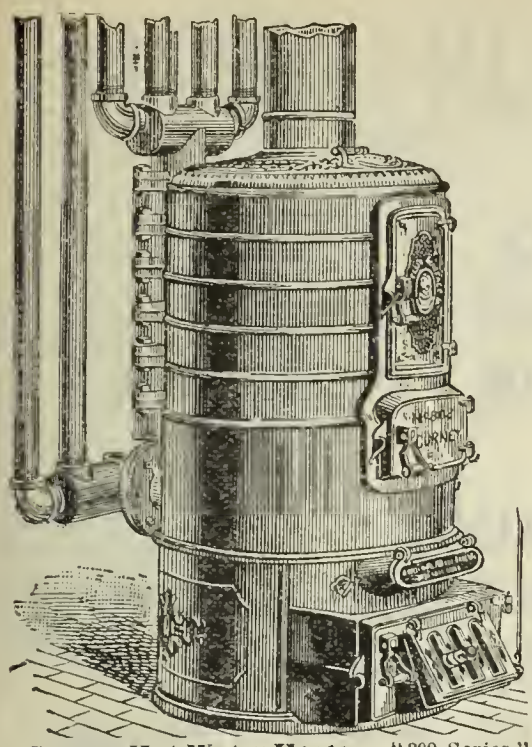
"Champion" Steam and Hot Water Heater.

"Thatcher" Ranges.

FOUNDRY, NEWARK, N J.

Take the Agency for your town, and your business will not only increase but be satisfactory.

SEND FOR CATALOGUE.



Gurney Hot Water Heater.- "300 Series."

RESULTS ARE CONVINCING EVIDENCE.

THE GREAT SUCCESS WHICH

Gurney

HOT WATER HEATERS, STEAM BOILERS RADIATORS,

Ha·e attained is due to the **FACT** that they embody

BEST

WORKMANSHIP, CONSTRUCTION, MATERIALS, ADAPTABILITY, IDEAS.

ALWAYS EQUAL TO THE OCCASION.

Send for Catalogues. Sold only to the Trade. **GURNEY HEATER MFG. CO.,** 163 Franklin St. Cor. Congress, Boston, Mass.

Selling Agents, A. A. Griffing Iron Co., 34 Dearborn St., Chicago, Western States.

GET IN LINE

WITH

THE STANDARD STEEL FURNACE

FOR

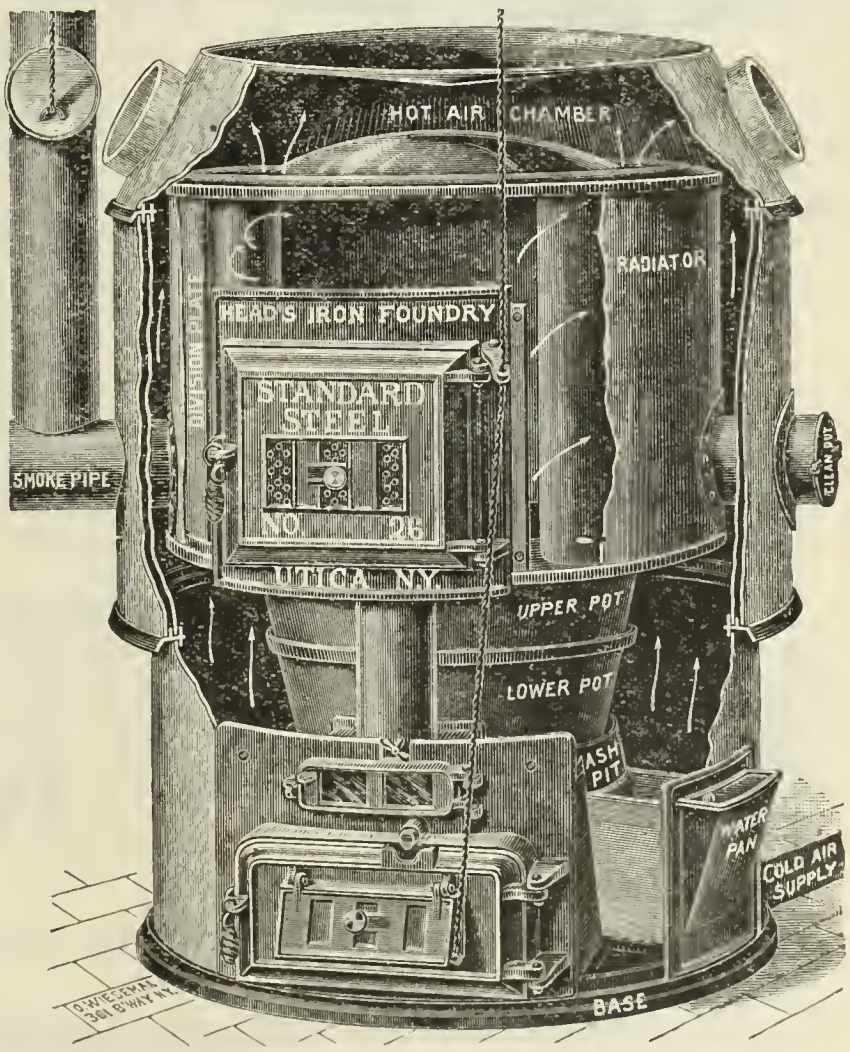
1895.

IT DEFIES ALL HONEST COMPETITION.

Order a sample furnace now. Show it to your trade. Talk it up. The PEOPLE know **a good thing** when they see it. The sample will talk **volumes.**

Let us send you quotations and Catalog.

GIBLIN & CO., Utica, N. Y.



DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best

—FOR—

Steam or Hot Water Heating.

—o—

Send for Catalogue.



The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

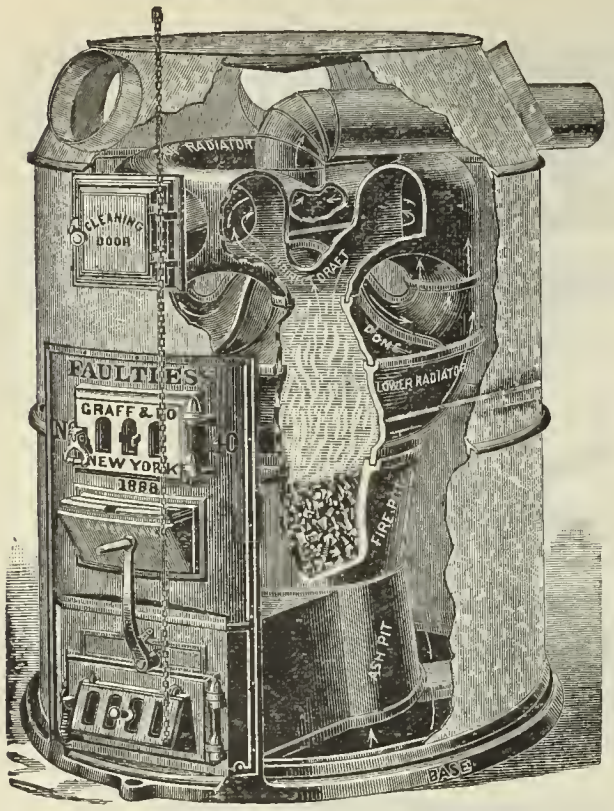
Packed Joints.



— "It strikes me that he has a good deal of assurance to call himself a boy pianist. He must be all of twenty-five."

"Guess he is; but he plays like a boy of nine."—*Indianapolis Journal.*

FAULTLESS.



SUPERIOR GOODS.

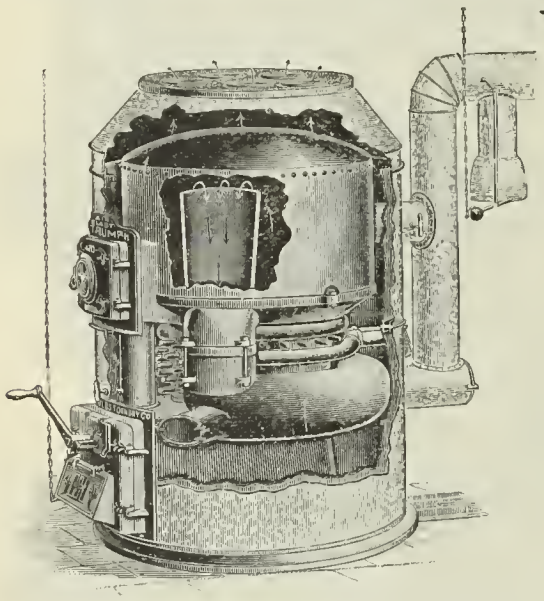
FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.

HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.

Faultless, Elegant and Columbian Ranges.

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.



Way Below Zero!

Is the kind of weather that emphasizes the great success of the

Triumph Heaters.

Write us for

The 1895 Catalogue of the Triumph Heaters,

or

The Principles of Heating and Ventilation,

with facts and figures, or

The Picture Book,

or

The Triumph Estimate Book,

All published for the use of the trade. Prices, Discounts and full information upon application.

The Craig-Reynolds Foundry Co.,

DAYTON, O.

Western Branch, GEO. D. HOFFMAN, Mgr., 82 Lake Street, Chicago, Ill.

The successful Furnaceman must have Heaters upon which he can rely to do the work. You will serve your own best interests by asking for information about the

DEALER'S BEST LINE:

The Triumph Special.
For hard coal. 5 sizes.

The Triumph All Cast.
Hard or soft coal. 5 sizes.

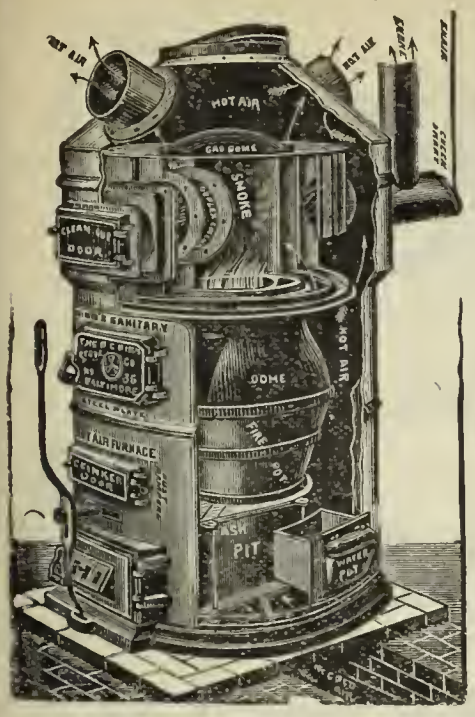
The Trinmph King.
Hard or soft coal. 4 sizes.

The Triumph Steel.
Hard coal. 5 sizes.

The Triumph Air Blast.
Soft coal. 5 sizes.

The Triumph Combination.
For hot water and air. 5 sizes.

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

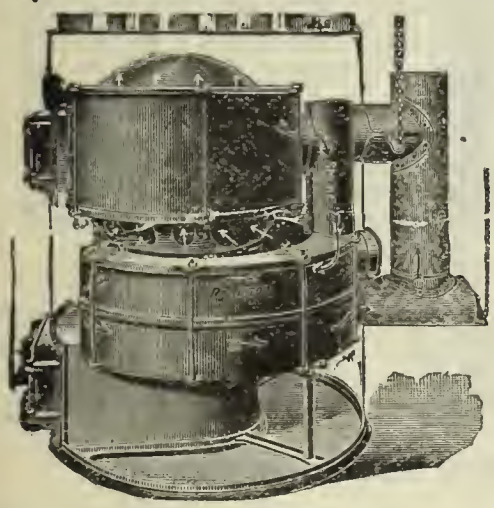
BIBB'S ORIGINAL

Baltimore Fire Place Heaters

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME
SECTIONAL FIRE POTS;
STAR GRATE.

It is a Great Economizer of Fuel.

It is a Low Furnace.

CORNING, N. Y., August 11, 1894.
CORNING MANUFACTURING CO., Corning, N. Y.
Gentlemen.—After using your Furnace at my residence for one season I take pleasure in recommending it as an economical coal burner, a rapid regulator and easily taken care of; and I feel confident that there are none in the market whose efficiency is greater.
Yours very truly,
S. T. HAYT, JR., Eng'r F. B. R'y Co.

Agents wanted. Address

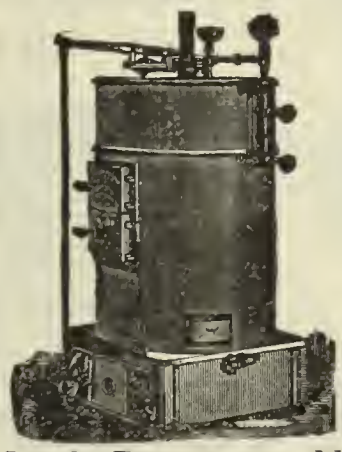
THE CORNING MANUFACTURING CO.,
CORNING, N. Y.

Both Sides of the "Page."

FITTER'S SIDE:

Easy to Handle, Quickly Set Up, One Sale makes more.

Our Catalogue proves this side.

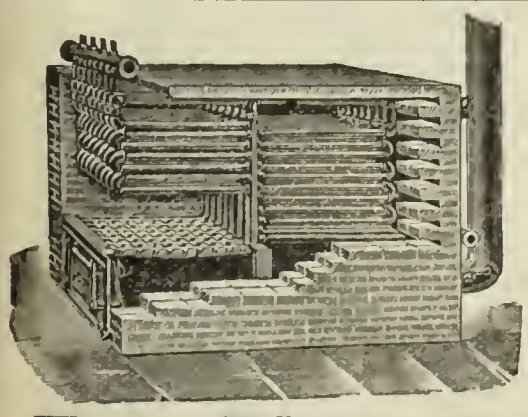


OWNER'S SIDE:

Little Fuel, Much Heat, No Repairs.

Our Testimonials prove this side.

W. C. MOWRY, Lock Box 314, NORWICH, CONN.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

Over 300 Different Sizes.

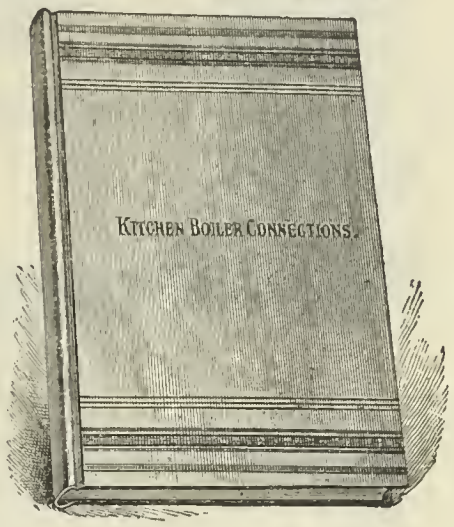
SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST.,
ROCHESTER, N. Y.
New York Office, 44 Dey Street.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth,
Price, $1.00

The book is well got up and the information well given Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

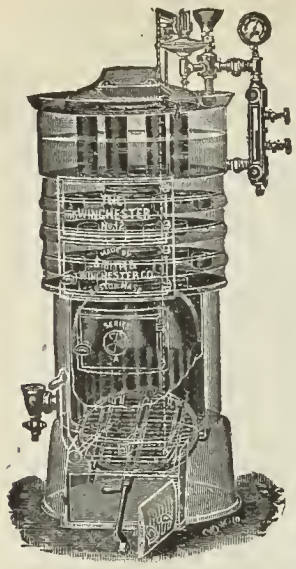
A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,
96-102 Reade Street, NEW YORK



The Winchester



Has more **COMMENDABLE**

And less **OBJECTIONABLE FEATURES**

Than any Heater on the Market.

——MADE BY——

SMITH & WINCHESTER CO., Boston, Mass.

Our prices on these Heaters will please you. Send for them.

LARGEST ASSORTMENT OF STYLES AND SIZES IN THE MARKET.

CORRESPONDENCE SOLICITED. CATALOGUES GIVE FULL DESCRIPTION.

SOLD ON THEIR MERITS NOT ON THEIR ANTIQUITY.

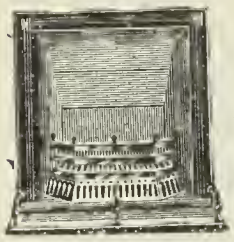
Royal HEATERS.

COMBINATION.

HOT WATER. STEAM. HOT AIR.

MANUFACTURED BY HART & CROUSE. UTICA, N.Y.

NEW YORK 211 WATER ST. CHICAGO 79 LAKE ST.



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

Fireproof Celluloid.

The dangers attending the manufacture of ordinary commercial celluloid are well known. We understand, says *Industries and Iron*, that a member of the firm of A. & F. Pears, together with an associate inventor, have been successful in manufacturing a perfectly fireproof celluloid from spent fibers from paper mills, which they are proposing to manufacture on a large scale. The experimental works at Exeter, England, contain the necessary motive power, with edge runners, otherwise "Kollergangs," centrifugal pump, glazing rolls, guillotine, hydraulic press, laboratory, drying room, &c. The pulp, consisting of fibers collected from washing water of the paper mill, is placed in a dry state under the edge runners, and after treatment for some time is removed into a vat and submitted to the action of certain chemicals, which reduce it to a glutinous state. It is then sent through the centrifugal pump, which gives it an even substance, and any shade of color is then imparted to it at the same time by aniline dyes. It is then strained through flannel into square boxes, and after a time assumes an almost solid consistency. The celluloid can then be cut into slices, or molded when the composition is in a liquid state. It is proposed to make printing surfaces for illustrations, for stereotyping, together with its utilization for the manifold varieties of purposes to which the ordinary celluloid of commerce is now applied. The perfect safety of the new substance is shown by the workmen being allowed to smoke on the premises during the course of manufacture.



KEEP IN MIND

The Plummer Steam Heater

AND

The Leader Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,

PUTNAM, CONN.

THE VOLUNTEER

STEAM



For hot water or steam has no superior, and is the only hot water boiler that is SELF-REGULATING.

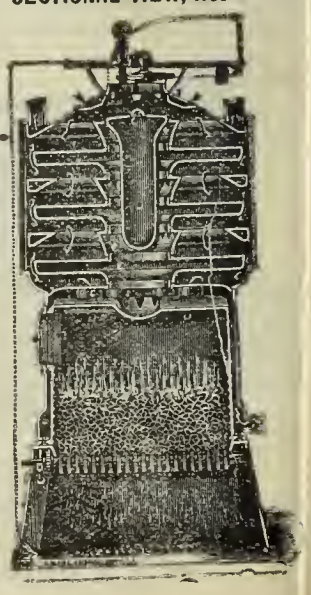
Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Street.

SECTIONAL VIEW, Hot Water.





We Take This Opportunity

Of reminding you that we are still

ON TOP!

OUR GOODS EXCEL!
OUR PRICES SUIT!

We Deal with the Trade Only.

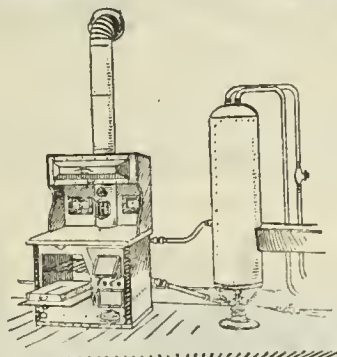
American Boiler Company

94 Centre St., New York. 84 Lake St., Chicago

★ STAR WATER BACK AND BOILER ★
COUPLERS.

DONT WIPE YOUR JOINTS SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

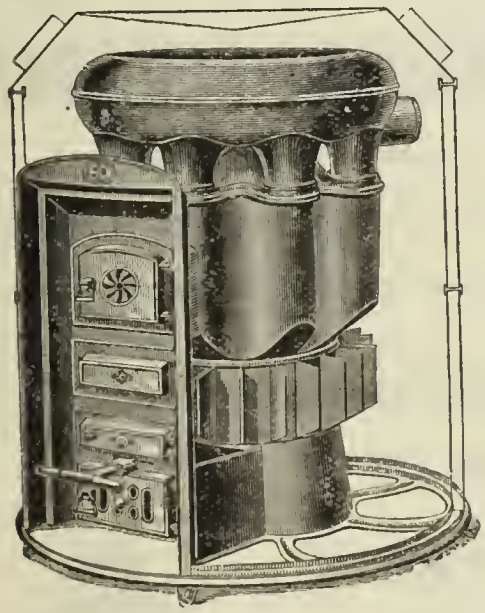
NO SOLDER NO BURST ANY MECHANIC CAN DO IT

WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

★ Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.

Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada. ★



CORY'S

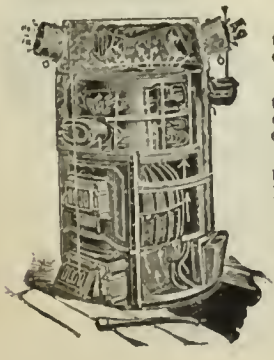
ALL CAST IRON
GAS-TIGHT FURNACES.

The purchaser will never ask if this is the *best* quality made, as all dealers understand the "Cory Furnace" to be only of *cast iron*, without bolted joints; gas-tight and durable. Quality exactly the same in twenty sizes from $35 to $125.

UZAL CORY & CO.,

210 Water St., New York.

Estab'lished 1847.



WHY IS IT
that the same dealers who sold the Boomer Furnace five years ago are still continuing its sale?

DID YOU EVER STOP TO THINK
that one or two years' experience with a poorly constructed light furnace always creates a demand for a furnace that has proven to be the best in the full sense of the word?

IF YOU WANT TO MAKE MONEY
buy the Improved Boomer Furnace, set it up right, please your customer, and you have the key to your future success.

REMEMBER
that a Boomer Fire Pot has never been known to crack or burn out. That it has the simplest and most effective Gas and Smoke Burner. Guaranteed the heaviest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS, Massillon, Ohio.

New Uses for Aluminum

New uses are almost continually being discovered for aluminum. The latest is the most unique and unlooked for. It is nothing more nor less, says *Ironmongery*, than that a powerful explosive can be made from it. The discoverer of this attribute of this modern metal is a French chemist. He found that by taking powdered aluminum and mixing it with binoxide of sodium an explosive was created that required neither concussion nor fire to discharge its latent energies. It seems that all it is necessary to do in order to effect this is to simply place it in contact with moisture. And when it does explode it is an explosion, the flame which it sends out instantly melting even copper wire. The explanation of the peculiar manner in which the explosive can be set off is that the moisture, decomposing the binoxide, disengages the oxygen in the nascent stage, which at once combines with the aluminum with great energy, causing the explosion which follows. Its utility for industrial purposes we know nothing about. That probably has yet to be demonstrated.

— He was Particular.—"No," said Mrs. Sparrowgrass to Weary Wiggles, "I can't give you any meat or any pie, because I haven't any; but I can give you a drink of milk, if that will do."

"Is it sterilized, mum?" asked the tramp, anxiously.—*Exchange.*

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student, and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

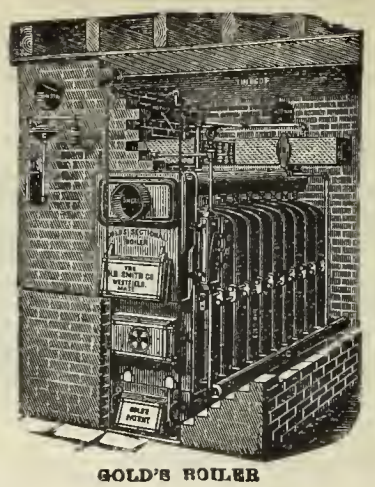
407 pages, 7 x 9½ inches Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



GOLD'S BOILER

THE H. B. SMITH CO.,

MANUFACTURERS OF

Steam and Water

Heating Apparatus

FOR

PUBLIC BUILDINGS AND PRIVATE RESIDENCES

SPECIALTIES:

Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
Reed's Improved Cast-Iron Radiators,
Gold's Indirect Pin Radiators,
Breckenridge's Patent Automatic Air Valves,
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for hard or soft coal.

Office & Warerooms, 137 Centre Street, New York.

FOUNDRY, WESTFIELD, MASS.

Catalogues Sent on Application

STEAM
HOT WATER
WARM AIR
FOR HEATING ALL CLASSES OF BUILDINGS

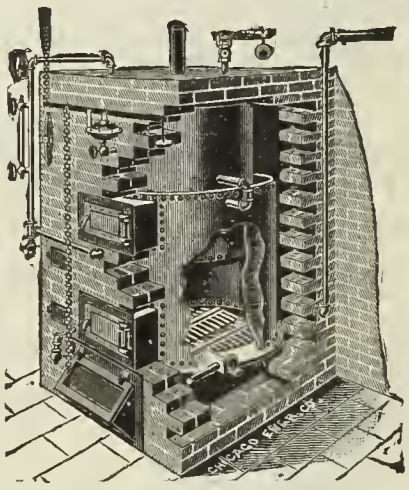
CAPITOL HEATERS

OUR LITTLE BOOK
"WARMTH FOR WINTER HOMES"
TREATING OF HEATING, RADIATION, VENTILATION ETC
IS INTERESTING AND INSTRUCTIVE
WE SEND IT FREE

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.



HAXTUN BOILER

FOR STEAM AND

HOT WATER HEATING

Magazine with Front Feed—can use **HARD or SOFT COAL.**

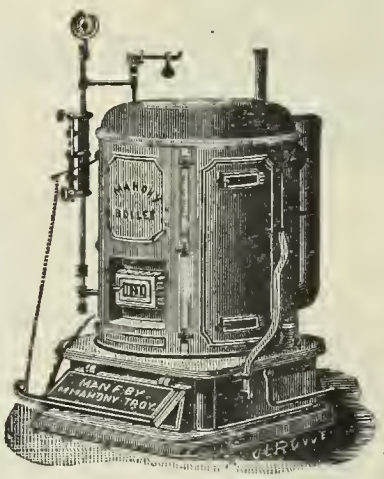
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



THE MAHONY BOILERS.

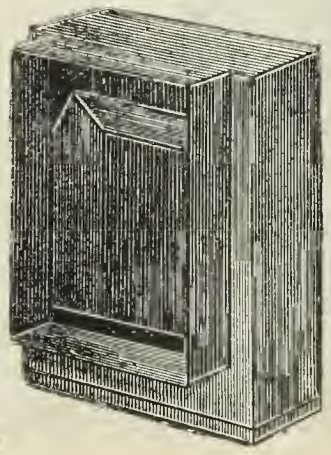
For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



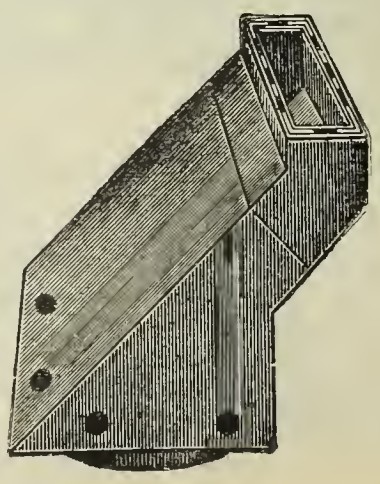
Novelty Ventilated Wall Pipe,

Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

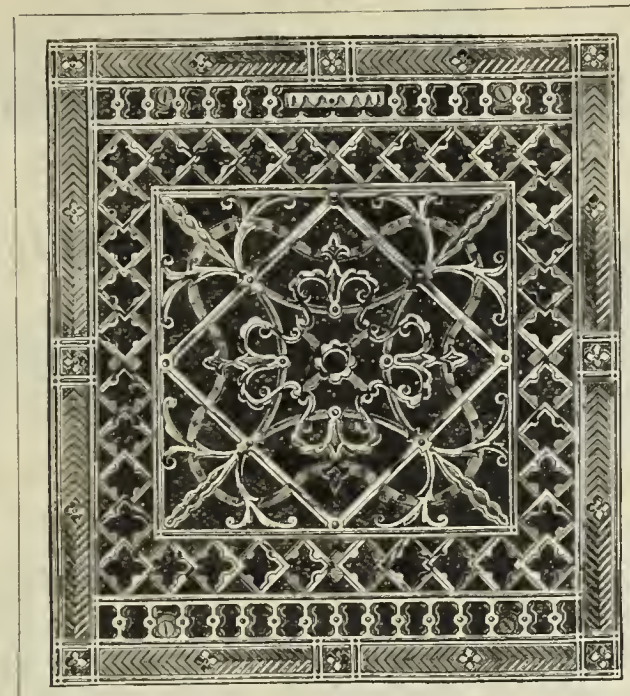
MANUFACTURED BY

JOHN P. SCHAFFER
18 Wood Street, Pittsburgh, Pa.



TUTTLE & BAILEY MFG. CO.,

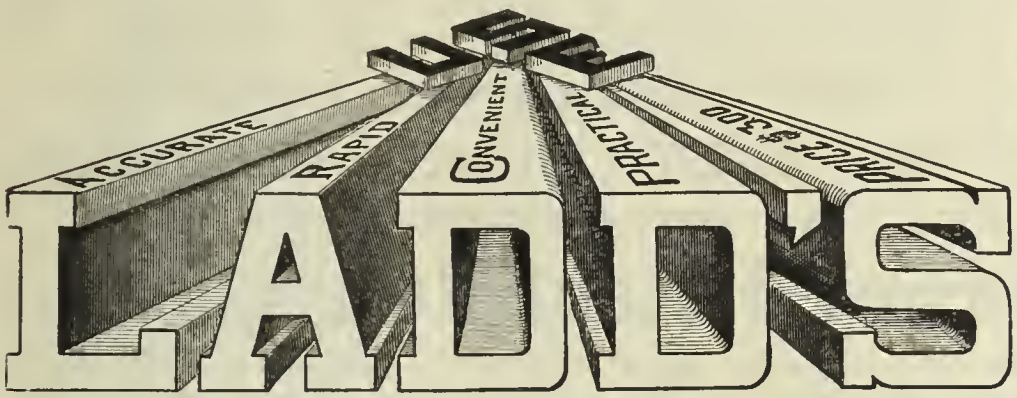
REGISTERS, VENTILATORS, &c.



FLORENTINE DESIGN.

REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.



LADD'S

DISCOUNT BOOK.

PRICE, **$3.00**; DOUBLE INDEXED EDITION, **$4.00.**

Sent, postpaid, to any address upon receipt of price, by

DAVID WILLIAMS, Bookseller and Publisher,

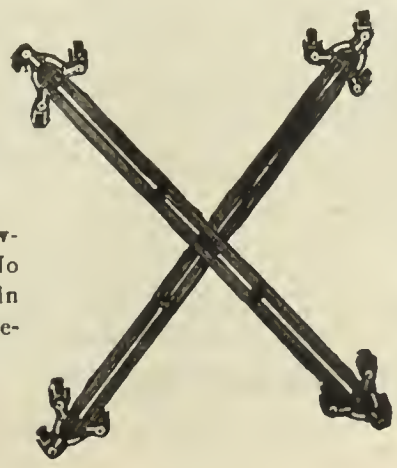
96-102 Reade Street, New York.



THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

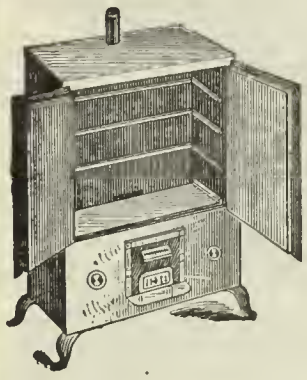
MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.



BLODGETT'S PATENT PORTABLE OVEN

—FOR—



Hotels,
Steamships,
Confectioners,
Japanning,
Core Baking,
Public
Institutions,
&c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.

Burlington, Vt.



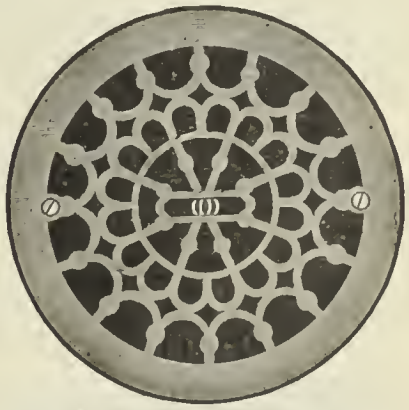
Warm-Air Registers, Ventilators, Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers, Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.

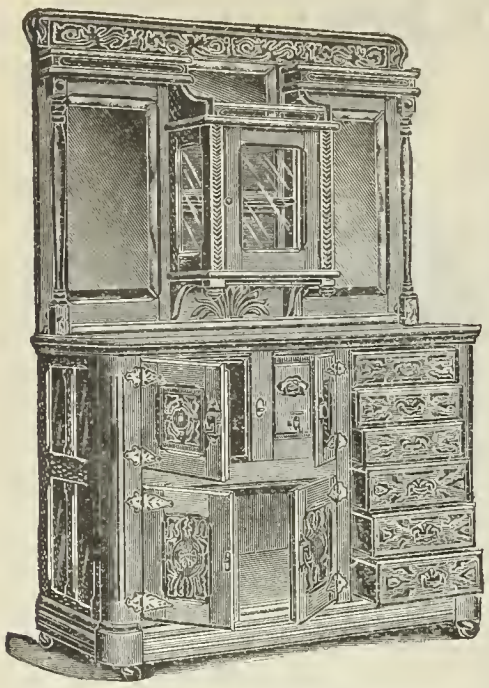
PRESERVE THIS ADDRESS.

Important to Dealers. You can obtain

REPAIRS

for the "Gold's" Celebrated Steam and Warm Air Furnaces,
"Health," "Hygienic," and "Tubular," also for the "McGregor" and "Peacemaker" furnaces, of

GEO. D. WAAS,
Successor to JOHN H. KEYSER,
136 Beekman St., - New York, N. Y.



GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co., Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.
Lee-Clarke-Andreesen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Wm. Miller Range & Furnace Co., Cincinnati, O.
Doggett Dry Goods Co., Kansas City, Mo.

BUY THE BEST.

—THE—

Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,

GRAND HAVEN, MICH., U. S. A.

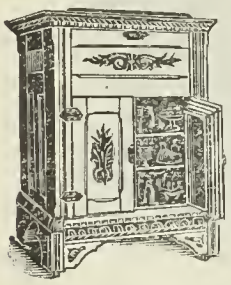
Write for our large Illustrated Catalogue for 1895.

All our goods are made of thoroughly kiln dried ash, finished in antique with Shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups All Refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

THE CHALLENGE ICEBERG,

THE ∴ HONEST ∴ RELIABLE ∴ REFRIGERATORS,

SELL THE BEST.



No. 21.

The Gurney Patent Refrigerator

is the BEST SELLER, gives the BEST SATISFACTION and PROFIT to the dealer of any refrigerator on the market. BECAUSE—It has special FEATURES, "TALKING POINTS," SELLING POINTS, not found in other refrigerators.

1. By the use of a ***Removable Galvanized Ice Compartment*** the ***"Gurney"*** can be cleaned. This feature alone assures its sale.

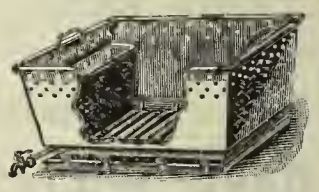
2. Under the ***"Gurney"*** principles of construction the ***lowest*** average temperature is reached with the ***greatest economy of ice,*** as fully explained in our catalogue.

3. In the ***"Gurney"*** the ice does not come in contact with the zinc side walls, thus preventing condensation or "sweating" on the inside linings, an important feature of cleanliness and durability.

4. It is packed with Mineral Wool (the best non-conductor known).

5. It has the freest circulation and dryest air, there being a large space around the four side walls of the ice compartment, thus giving about six times the condensing surface of any refrigerator.

6. In style and finish it leads all competitors.



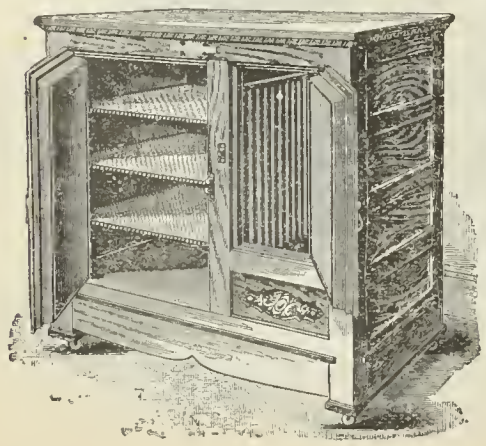
Removable Galvanized Ice Compartment.

Send for Illustrated Catalogue and secure Agency.

GURNEY REFRIGERATOR CO., Fond du Lac, Wis.

The Automatic Refrigerator

has more good points and does better work than any other and for that reason is a better seller. Our illustrated catalogue for 1895 tells all about the line. Its advantages are:



Perfect circulation.
Large condensing and purifying capacity.
It has no flues to cause it to smell bad.
The trap is inside where it cannot be misplaced or lost.
The drip pipe may be cleaned without disturbing anything in either chamber, and is entirely out of the way
It has nine walls to protect the ice and to maintain a uniform temperature in the cooling chamber.
It has woven wire provision shelves that are superior.
It has superior hardware.
It is more capacious and convenient.
Flavors of foods will not mix.
Last but not least, it's different, and will bring new customers and new trade.

We want the leading dealers to sell our goods and but one dealer in a place.
The goods are made of ash, and well finished.
We have two factories, one in the East and one in the West, and are able to take better care of your trade than if we had but one.

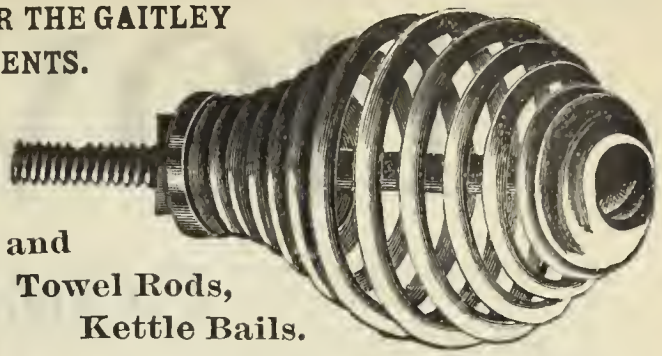
For catalogue and discount address:

Illinois Refrigerator Co,
909 Masonic Temple,
Chicago.
If West of Chicago.

Columbia Refrigerator Co.,
Northville,
Wayne Co., Mich.
If East of Chicago.



MADE UNDER THE GAITLEY PATENTS.



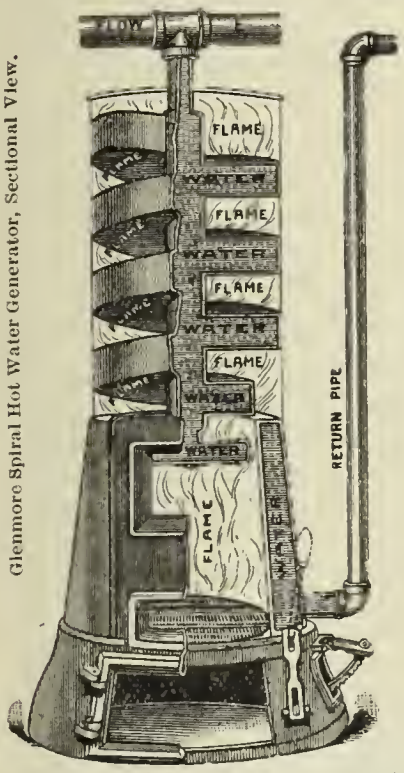
ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.

Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.



MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.



Glenmore Spiral Hot Water Generator, Sectional View.

THE GLENMORE

Spiral Hot Water Generator.

(PATENTED.)

For General Heating Purposes, but Especially Adapted to House Heating.

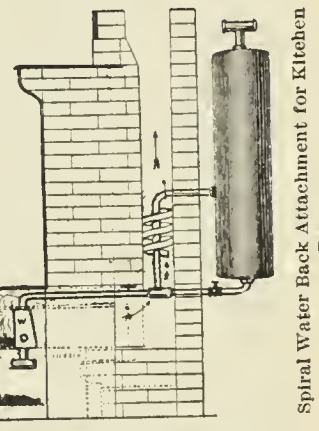
COMMENDATORY POINTS:

Simple construction. Practically composed of two sections, consequently few joints and nothing to give out.
Large heating surfaces.
Products of combustion fully utilized.
Instantaneous generation of hot water.
Free and easy circulation.
Easily cleaned fire surfaces.
Hot water may be drawn off at any point along the pipe circuit without materially affecting the heating service.
Grate conducive to economy in fuel.

Spiral Water Back Attachment for Kitchen Ranges.

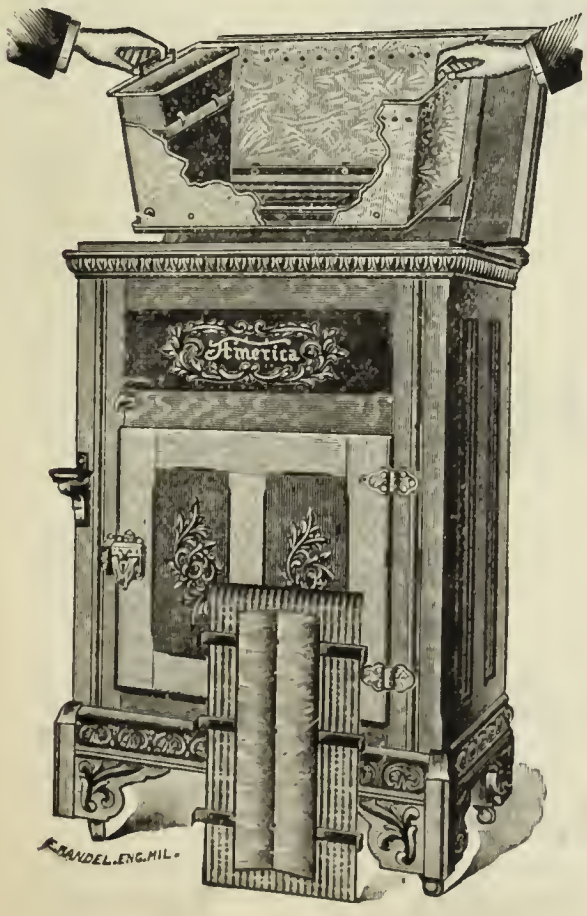
By utilizing waste heat, this water back extends the capacity of a kitchen boiler, and makes it a valuable heating auxiliary, especially in spring and fall, when the regular heating apparatus is too powerful.

☞Send for Pamphlet.



Spiral Water Back Attachment for Kitchen Ranges.

GLENMORE FOUNDRY AND MACHINE CO., 73d ST. and WOODLAND AVE., PHILADELPHIA, PA.



The America!

GEM OF

REFRIGERATORS.

Patented Removable Ice Compartment.

Can be kept clean with the least trouble.

Its construction for cleanliness, drainage of waste water, circulation and insulation is perfect.

Write for catalogue and investigate our claims. It will pay you to secure the agency in your town.

THE

Bowen Manufacturing Co.,

FOND DU LAC, WIS.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE

THE BEST IN THE WORLD!

OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

At LOWEST PRICES EVER KNOWN.

If your dealer does not have them, Send for Illustrated Circular and Price-List, to

JOS. W. WAYNE,

MANUFACTURER,

124 MAIN STREET, CINCINNATI, O.

— SAVED.—O'Fake: "When I was in the water every sin I ever committed flashed through my mind."

O'Toole: "Be th' saints, no doubt that saved ye."

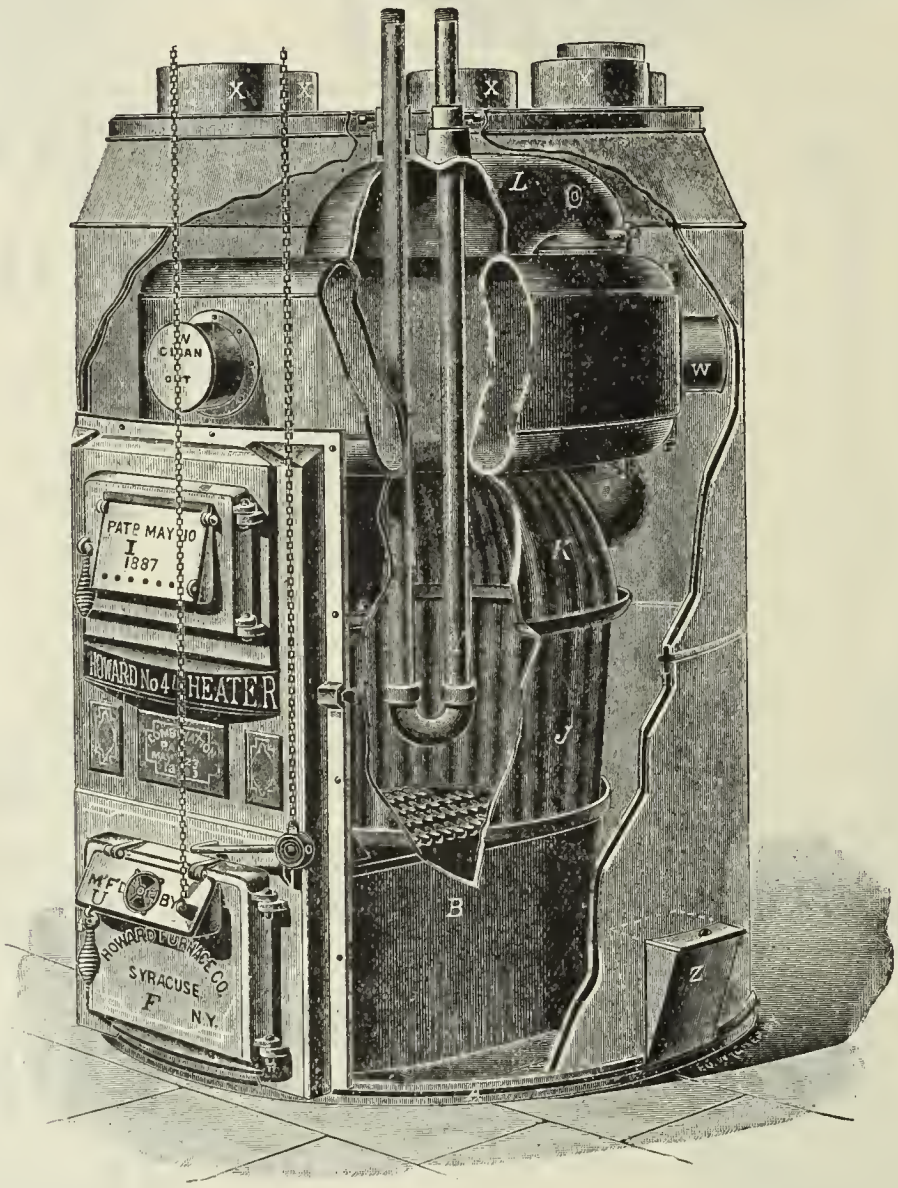
O'Fake: "How could it?"

O'Toole: "Ye had enough to hould out till the byes t'run ye a rope?"—*The World.*

HOWARD

COMBINATION

HEATER.



IT'S ADJUSTABLE.

WE CAN TELL MORE.
WRITE TO

HOWARD FURNACE CO.,

SYRACUSE, N. Y.

New York, Boston, Grand Rapids, Toronto.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, February 16, 1895.

DAVID WILLIAMS - PUBLISHER

BUSINESS OFFICES:

NEW YORK .....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND .....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 7.
Index to Reading Matter.....Page 53.

A New Illuminant.

Gas fitters are likely to have their field of operations enlarged by the commercial introduction of an illuminant that hitherto has cost so much to make that, although its qualities have been for a considerable period known to chemists, it has not been considered practicable to use it for the purpose of artificial lighting. This curious substance, known as acetylene, is a gas which, in its pure state, burns freely with a rather smoky flame very much resembling in appearance the flame of a ball of cotton soaked in oil of turpentine; but, when mixed with water gas of low candle power and in the proper proportions it increases the illuminating power of the poorer gas very greatly. It makes a still better and more economical light by mixing it with atmospheric air in a manner which has been somewhat employed for burning vaporized gasoline. But it has the advantage over gasoline vapor of not condensing to a liquid form in cold pipes, which has always been a difficulty in burning gasoline vapor, except in apparatus where this vapor is first converted into a permanent gas by the action of heat.

How Acetylene is Made.

When lime is heated with carbon in a closed vessel to a temperature of from 4500 to 5000° F., a substance called calcium carbide is formed. This substance, when excluded from air, is easily kept and transported; and in these respects it is well adapted to commerce. But the temperature required to form it has only recently been obtained at a cost commercially practicable by the use of the electric furnace, and even this was out of the question until the more recent improvements in dynamos were made. Now calcium carbide can be made much more cheaply than it ever could be produced before, and in large quantities. Although it can be kept indefinitely when excluded from moisture, when it is brought in contact with water it rapidly decomposes and gives off acetylene. This, without further preparation, mixed with air, makes one of the finest illuminating gases yet produced.

Application of Acetylene.

As yet, acetylene is not produced cheaply enough to be used as an enricher in large gas works and in competition with materials now employed for that purpose ; but, as the industry is in its infancy, all precedent points to the belief that it will be still further cheapened. It is stated on good authority that carbide of calcium can now be delivered to consumers at $80 per ton, including freights ; and also that a ton of it will produce enough acetylene to mix with air into an illuminant equal in lighting power to 100,000 cubic feet of illuminating gas of 25 candle-power. Although to this must be added the interest and deterioration on the apparatus needed to effect the decomposition of the calcium carbide and the admixture of the resulting acetylene with the needed quantity of air, and also some cost for attendance, the total cost of the gas so made is now low enough to render the new illuminant highly desirable for country seats, isolated hotels, &c., remote from city gas works ; and it also may be used in lighting railway cars.

The Weather and Plumbers.

It is quite notable that no class of workmen have suffered more during the recent cold weather than the plumbers. In many cases it has been simply heroic charity to leave a shop or job where the surroundings were clean and comfortable to make repairs made necessary by the zero weather. The plumber is truly a public benefactor when he comes promptly to restore to perfect order a modern plumbing system, the luxury of which is only appreciated when it must be foregone. It requires a robust moral courage as well as a strong body to make a careful and conscientious search for the leaks and troubles due to freezing, and then under great disadvantages to repair the job. Considerable suffering must be borne in wading through the water found and enduring the soaking that sometimes comes with the thawing process. In summer this would be disagreeable, but when the temperature is benumbing, so that it is difficult to work, the plumber runs a risk to health and life for which the few dollars earned by no means compensate. Working hours have no end during the emergency, and all to benefit customers who are very likely to prove anything but thankful for the service rendered when the bill is presented.

The German Stove Trade.

A German manufacturer of stoves recently visited some of our Northern stove foundries. The comparisons drawn by him between conditions prevailing here and those of his locality in Germany are interesting. He stated that for pig iron of the same grade he pays 40 per cent. more than is paid by our foundrymen, and for fuel double the American price, but his labor costs him only one-third of the daily rate paid here. Notwithstanding the higher American wages, he found that in many instances work is done in our foundries at a lower cost per piece than in Germany. This is ascribed to the system of piece work in vogue in American factories and the vim with which our workmen perform their tasks. He stated that it would be impossible to get his workmen to move with such celerity. They go to work at 6 o'clock in the morning, stop at 8 for breakfast, which takes half an hour or more, stop again at 12 for dinner and perhaps consume an hour and a half, take another rest at 4 to check the cravings of hunger, and stop finally at 6, thus nominally putting in 12 hours of work, but actually rendering about 9½ hours. They are contented and easily managed, their contentment being largely ascribed to the pension system now prevailing in Germany. This system provides a workman with an annual pension of $125 when he reaches the age of 70, provided that he has a good record as an industrious man. Elaborate arrangements are made by which the record of each workman is kept weekly. The pension is paid by the Government from a fund raised partly by small weekly payments by the workmen themselves, partly by corresponding payments made by employers and partly by appropriations from the Government revenues. The reduction of the pension receiving age to 65 yesrs is now being agitated.

One of the attractive features of the Cotton States and International Exposition, to be opened at Atlanta, Ga., next September, will be a reproduction in miniature of the Chicago World's Fair. The exhibit is being prepared by G. W. Ferris, the builder of the Ferris Wheel, on a scale of one-one hundred and fortieth. Every detail of the great Columbian Exposition will be given, the whole space to be occupied being 75 feet in length.

THE LETTER BOX.

Electric Bell Trouble.

From C., *Connecticut* —We have an electric bell connection between two buildings which are some 200 feet apart. The battery of five cells is located within 10 feet of the push button, and seems to be sufficient for one bell, but not for two as desired. It is an assorted battery, composed of a Diamond, Sampson and one cell not marked. These have each been tested on short circuit ; also, the wires are properly insulated. The question is, shall we increase the power by additional cells or lay the battery within 10 feet of the bells? We can't put it midway.

Answer.—As the current generated by the battery must travel around the entire circuit of bells and wire back to its starting point, it will readily be seen that the location of the battery on the line in no way affects its working. Our correspondent has an abundance of battery power now; in fact, more than necessary. Three cells should be sufficient for the purpose. Where more than one cell of battery is used they should be of one make. A mixed battery seldom gives good results. If, as stated, these cells have been separately tested and each found in good condition, three of them, if of the same construction, will suffice, bearing in mind that each of them must be in good condition, as one weak cell in any number of strong ones would bring them all down to its own level. The use of an unnecessarily strong battery is to be avoided, as it is apt to burn out the contact point which touches the armature of the bell. We understand from the query that our correspondent has two bells on one circuit which are to ring simultaneously. If such is the case, one of them should be converted into a single stroke bell, as the vibrations of one bell interfere with those of the other and neither will ring. *The Metal Worker* of December 2, 1893, under the head of "Domestic Electrical Work," Chapter 2, gives detailed information on the subject of operating more than one bell on one circuit. Fig. 5 of this chapter shows the manner of changing an ordinary vibrating bell to single stroke. Our correspondent should be sure that he has but one wire under a staple on the circuit.

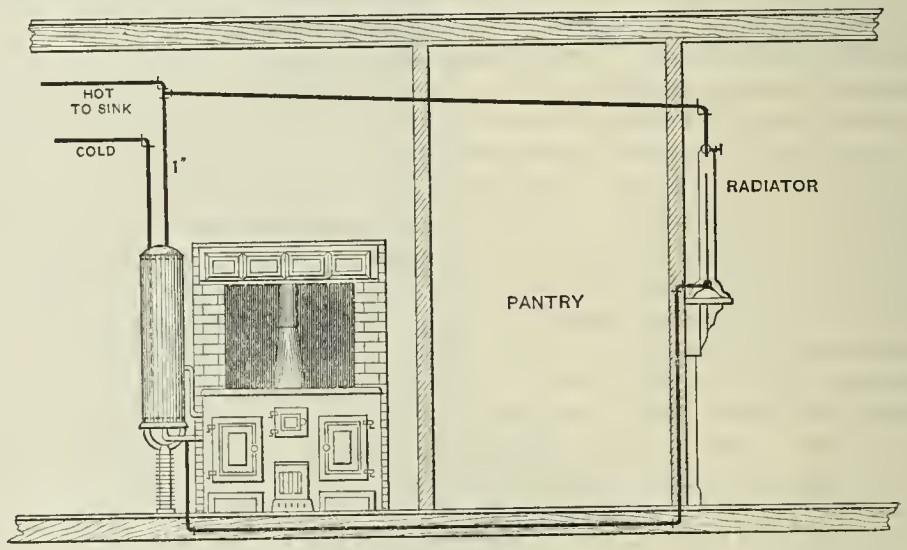
Cold Air Duct.

From EDWARD TRORLICHT. *St. Louis* —In *The Metal Worker* of February 2 "J. L." of Pittsburgh, Pa., requests from your readers the address of a manufacturer of air filters for furnace cold air ducts. I inclose you a circular giving description and name of the manufacturer of such an article.

Note.—The circular inclosed in our correspondent's letter is issued by the Ludlow Saylor Wire Company, St. Louis, Mo., and illustrates and describes their patent soot screen, which is a wire screen carrying a filtering fabric to prevent the entrance of dust. The screens are fitted to wooden frames, which can be removed from the cold air duct.

Will It Work?

From F. L. M., *Roseville, N. J.*—The range in a flat here makes more hot water than is needed and I want to utilize the surplus heat for heating the dining room, which is now heated by a stove. Between the kitchen and dining room there is a pantry 4 feet wide through which the piping would have to run, as shown by the sketch sent herewith. The question is, can the dining room be heated by hot water circulation from the range water back which has ample heating power? The idea is to take the brass connection out of the top of the boiler and pipe with 1-inch iron pipe to the radiator with a fall all the way to it. A ¾ inch branch will be taken from the flow pipe at the top of the boiler to supply the kitchen and bathroom. A stop cock will be placed on the flow at the radiator, and as the supply to the house fixtures will come out of the top of the flow I think that an air valve will not be needed. A 1-inch return will run from the radiator down to the floor and across the pantry and along in front of the range, close up out of the way, and will rise to the water back and connect full size. The cold water pipe from the boiler will connect into the ¾-inch opening in the tee on the return pipe. I would like the readers of *The Metal Worker* who have had experience in hot water heating to give their views on this plan. If the room was over the kitchen I know it would work. Would the radiator work as well or better if it was placed on the floor instead of on the mantel where it is out of the way. The dining room is 10 feet 6 inches by 18 feet with a 10-foot ceiling and has a large window. The pantry through which the pipes pass has a window. Should the pipes be wrapped?



Will It Work?—Section through Rooms.

Method of Heating Water.

From J. P., *Massachusetts.*—I would like to have the opinion of the readers of *The Metal Worker* on the following arrangement for supplying hot water by means of a boiler to several apartments in a building : I wish to locate a boiler of sufficient size at some convenient point, and then during the winter season heat the water by means of a coil placed at the fire chamber of the steam heater. I wish to know if a small hot water heater can be connected with the pipe from the coil in the steam heater and heat the water in summer? I should be glad to receive some assistance in the method of piping such a plant. I am thinking of putting a coil of 1¼ inch iron pipe in two parts, each 3 feet long inside of the fire chamber of the boiler, which is brick set.

Utilizing Artesian Well Pressure.

From G. L , *West Virginia* —I have an artesian well, and it has a pressure of 85 pounds to the square inch, its flow of water about filling a 1½ inch pipe. I would like to know if this water can be utilized to carry the water out of a mine situated about 25 yards from the wall and 35 feet deep, a 1-inch pipe being large enough to carry off all the water from the mine.

Note.—Our correspondent can undoubtedly make use of the high pressure of his artesian well supply to remove the water from the adjacent mine but the best method of accomplishing that result we will leave to the discussion of our readers. We would suggest, however, that some of the automatic

cellar drainers which are operated by water power might be useful in this connection. Another plan would be to run a water motor attached to a pump. This is an interesting topic, however, and we will leave it to the discussion of our readers.

A Plea for Temperance.

From VETERAN.—I was pleased to read your editorial in a recent issue on "Hobbies." It contained a great deal of useful thought in a few words. Especially I liked the reference to old men, to which class I belong, and can testify that I would be living a very unsatisfactory life if I had not a hobby. After "going through the mill" and knowing much from my own experience I am almost a crank on the subject of temperance as it applies to business men and their dealings with employees. No concern, large or small, escapes the evil of the drink habit, and too many men who could use a good influence with their workmen fail to do so from the fact that it is tiresome and unpleasant to try to reform their men. Such persons fail to see that most drinking men can be got to moderation, if not abstinence, by a systematic course of kind reasoning, together with a lesson that carries a penalty with it, which the workman knows is his own fault. I refer to not allowing a man to do any work if he is in the least under the influence of drink. A day off means a fine of $2 or $3, and it is self imposed. How can any one expect to get a roof properly soldered by a man who is half boozed with beer? He will miss lots of small seams in corners and obscure places, and this applies to any other work as well. I know that it is not the object of *The Metal Worker* to teach morals, but I also know that the interests of both labor and capital are at stake on this subject, and I feel sure that much could be accomplished by studying the characteristics of different workmen and using the right words at the right time for the good of all, including the general public.

An Appreciative Reader.

From P. STAUFFER, *Moberley, Mo.*—As the time approaches when I am about to leave my apprenticeship in working at cornice making, I would like to tell of my experience in learning the trade. The first thing I did after entering the shop was to subscribe for *The Metal Worker*, reading it through every week, giving particular attention to the pattern problems it contained, and I am free to say that no boy learning the cornice trade should be without *The Metal Worker*. I found, however, that the patterns did not come fast enough in your paper, so I saved up my money for "The Metal Worker Pattern Book," which is a work of the greatest value. Instead of wasting my time in the evenings I would study the pattern book and work out its problems, having made a drawing board according to the directions given in the book. I soon was able to cut all ordinary patterns, and the proprietor, to test my skill, gave me a chance to cut a miter, which I did successfully, and soon got other and more difficult work to do. No boy in a cornice shop should have any idle time, for when not working he should procure the necessary books and study to advance himself in pattern cutting and designing.

Are Gravel Roofs Durable?

From G. D. B., *Greenville, S. C.*—There are in course of construction in this section several cotton mills, most of them having been designed by Northern architects, who specified that they should be covered with five ply tar and gravel roofing. We know little about the durability of gravel roofing and are seeking information as to its durability and comparative cost, and believe that there is no better medium than through the columns of *The Metal Worker*, with the editor's remarks and the opinions of the readers in various parts of the country. We would just as soon put on a tar and gravel roof for a customer as a tin roof if we knew how it would last, but from the nature of the material we can form no opinion as to its durability compared with a tin roof for the same price. We can put on a gravel roof for $5 per square five ply, but can put on a better one of tin and make more money at $4 per square. We have put tin roofs on cotton mills 20 years ago and they appear perfectly good to-day. The chief objection to tin is the intense heat of the upper stories in summer. The writer has traveled some and has always observed the roofs used in the various cities. In Richmond, Baltimore, Philadelphia and New York we were struck with the great number of tin roofs. Cincinnati has quite a variety of roofs, mostly metal and slate. In Chicago hardly anything else is seen but gravel roofing. In the Gulf cities, Mobile, New Orleans, Galveston, and more particularly New Orleans, it was the exception to see a tin roof, nearly all of the roofs being of slate. This we suppose was to secure the water for drinking purposes. On the wharves there were quite a number of shell roofs, the shells being used instead of gravel on a tar roof.

Note.—We would call the attention of this correspondent to articles which appeared in *The Metal Worker* on gravel roofing on the 13th of October and the 1st of December. These do not give any information on either the cost or durability, but we hope our readers will give the result of their experience on both, as the information would be of value to a great many readers.

Heating Water by Electricity.

From J. R., *Hoboken, N. J.*—One of my customers has an office in a building which is heated by indirect steam and lighted by electricity. There is a lavatory in the office, but no means available for heating water, which he desires for lavatory use. Will some reader of *The Metal Worker* describe just how to proceed to heat water by electricity, using one of the incandescent lamps for the purpose? I know nothing of electricity, and hope sketches and description will be given so that I can get an electrician to do the work if necessary.

Making an Oil Tank.

From W. R. T., *Waynetown, Ind.*—I should like to know the proper way to make an oil tank with a partition in it for the retail oil trade, the tank to be 16 inches in diameter by 8 feet long. One of the compartments is to be filled with coal oil and the other with gasoline. My customer wants it made out of No. 20 galvanized iron. I would like to know the best way to put on the bottom and top, and also the position of the pipes. It is to have two faucets and an air valve. What is the best size pipe to use?

Purifying Cistern Water.

From EAGLE & OTT, *Ronceverte, W. Va.*—We notice in *The Metal Worker* of February 2 an inquiry from "M. A. X.," Cane Creek, Tenn., asking for information about a method of cleaning cistern water without drawing off the water. We inclose you a circular of the Perfection water elevator and purifying pump, which we think will answer the inquiry.

Can Top Wanted.

From D. M. ALEXANDER, *Westerville, Ohio*—Can any reader of *The Metal Worker* tell me where I can get a can screw that has a recess or groove in it for wax to make it air tight? I want to use it for maple syrup cans.

Cleaning Zinc.

From W. H. R.—Will you please inform me if there is any way to clean zinc?

Answer.—An answer previously published to this same question was as follows: A well-known recipe book says zinc is generally mechanically pickled by scouring with sand and powdered pumice. The bath used for brass is also very effectual; it is composed of one part of ordinary nitric acid and one part of sulphuric acid and must be washed off with clean water. To larger articles which cannot be dipped in the bath of acid and water apply a solution of potassium ammonium tartrate thickened with sufficient clay to form a fluid paste. After a few hours rub the article with a brush dipped occasionally into fine sand moistened with the pickle, then polish with powdered charcoal or Vienna lime.

Enameling Gasoline Stoves.

From W. R. T., *Waynetown, Ind.*—I would like to inquire through *The Metal Worker* for the best way of re-enameling gasoline stoves. There is an increasing demand for this kind of work and I should like to know how to do it.

Insurance Rates on Gasoline Stoves.

From W. & T., *Northville, N. Y.*—Replying to "C. P. A.," Port Ewen, N. Y., whose letter appeared in *The Metal Worker* of February 2, we are using a gasoline fire pot in our shop and do not have to pay extra insurance. Our rate is $16.60 per $1000. We asked our agent for a permit to use the gasoline fire pot, and he said, after seeing the pot, that we did not need one.

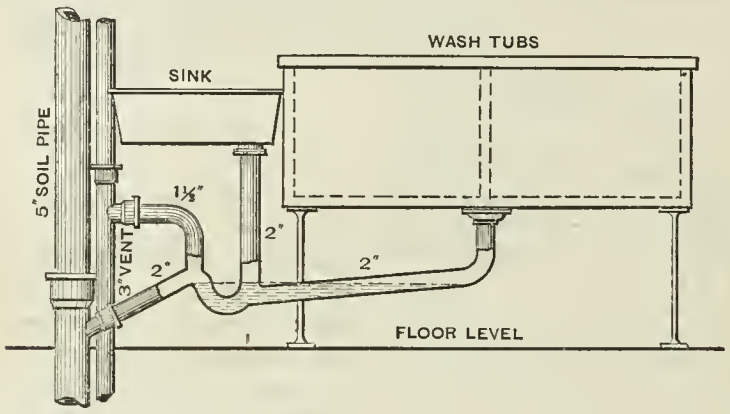
Anti-Freezing Mortar.

From C. S. L., *New Jersey.*—Please inform me if there is not a recipe for making mortar for cellar walls that will not freeze. Is not salt sometimes used in Canada for this purpose, and if so what are the proportions?

PLUMBING and GAS FITTING.

Example of Faulty Plumbing.

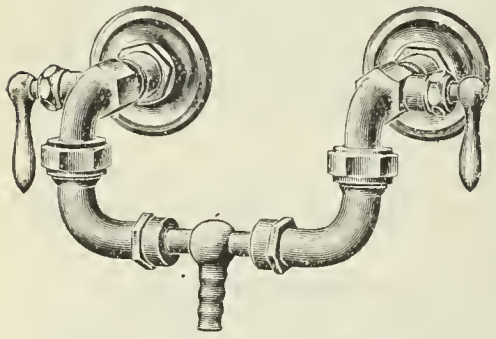
From H. D., *New York.*—Inclosed you will find a sketch showing a sample of plumbing work which has recently come to my notice and which, in my opinion, reflects seriously on the intelligence of the parties having the supervision of the work. The defective portion consists of the connecting of the waste from the tubs below the inside crown of the sink trap, therefore causing a larger amount of stagnant water to remain in the pipes than is necessary. The diagram will make this very clear to the uninitiated. Further comment is unnecessary.



Example of Faulty Plumbing.

Kelly Extension Slip Joint Connection.

We show in the accompanying illustration a device recently invented by Thomas Kelly & Brothers, 124 Franklin street, Chicago, Ill. The connection is used to unify two single bath cocks, and so convert them into a combination or double bath cock. No solder or fitting is required, for by screwing up the nuts a rubber ring is extended. It can, we understand, be made so tight by hand that it cannot be pulled off. The joint is 6 inches when closed, and will extend to 9 inches when opened full. Messrs. Kelly & Brothers saw the necessity of a connection of this kind when they introduced their shower bath ring.



The Kelly Extension Slip Joint Connection.

An error was made in the name of A. L. Brown, Norfolk, Conn., in the description of "A Suburban Water Supply," in *The Metal Worker*, January 12. Major Middlebrook of Bridgeport and Mr. Brown are old acquaintances and authorities on hydraulic ram work.

Sanitation.*

BY ROBERT MORGAN.

Out of the vast number of questions pressing upon civilized communities for recognition and solution, none is more urgent in its demands, or more inexorable in its revenge if neglected, than sanitation. If met with proper consideration and its demands complied with, it becomes a most powerful ally in the cause of civilization and progress. Disregard its commands and it becomes a merciless scourger, destroying alike the helpless infant and the ignorant or neglectful adult. Where large communities are congregated together its demands are most imperative and in these later days our ears have been opened to its warnings. The chemist in his laboratory, the physician in his office or in our homes, the plumber in his daily round of business have taken up the warning note and already people in all quarters are heeding the cry. Humanity calls loudly for the protection and preservation of health, without which life itself loses its value and its charm.

There are "many gates to death," but few are left wider open than those leading to the dwellings of mankind when unlocked by such skeleton keys as foul gases, bad air, impure water, &c. Is it not astonishing that while nations will draw heavily on the resources of their countries to train men in the arts of war for the purpose of protecting life and property from the ravages of the enemy, they do almost nothing to teach the people how to protect themselves against the constant ravages of disease and death? Where are the magnificent sanitary science halls erected by the Government where willing students perfect themselves in the knowledge of sanitary engineering and plumbing? It was no doubt the design of an Allwise Being that all men, rich or poor, should share alike in the enjoyment of pure air and pure water. Do they? The rich man can afford to pay for all such appliances as tend to secure these blessings for himself, and he may select any location to build his home that he chooses, but the very poor have neither the power nor the means to get an equal share with their favored brethren. They must take what their small means will enable them to pay for, and that is so little as to astonish us when we come to know about it.

Look at the sanitary conditions of the tenement house district of almost any populous city. What are the provisions for ventilation, for bathing, for drainage? Mostly conspicuous by their absence or inadequacy. And yet the very poor usually pay more in proportion for two small rooms in such barracks as these than a man of moderate means pays for three times the number of rooms furnished with some sanitary appliances. No use to blame architects for the ill-constructed buildings and bad drainage referred to. Probably no architect ever saw a plan of most of them. When houses are unfit for occupation by reason of their lack of sanitation the strong arm of the law should be applied to effect a remedy. If every man who loves his fellow man would lift up his voice to protest against this injustice to man the local or State government would soon find means to compel the renovation of unsanitary buildings, the erection of new ones on sanitary principles and the provision of ample public baths in neighborhoods where private baths are unknown because too costly for tenement house purposes. Cleanliness may not promote godliness, but it will tend toward self respect and consequent morality. A house becomes more valuable by making the plumbing and drainage perfect, so the landlord reaps a benefit as well as the tenant, and where the owner refuses to place his houses in proper sanitary condition the law should step in and either compel him to do so or deny him the privilege of renting them.

Another point that needs restriction by law is the practice in large cities of constructing buildings of excessive hight, resulting in many instances in the complete exclusion of the direct rays of sunlight where the streets are narrow, leaving them little better than damp, unwholesome passages. Allow the gutters of such dark streets to become the receptacles of refuse, as so often happens in large cities, and they soon become the breeding places for fevers, diphtheria, &c. Street cleaning, though supposed to be regulated by law, is too often a farce. It has been remarked that we have as good laws as any nation, but the trouble is that they are not always enforced. I believe that the construction of lavatories and toilets similar to those under ground in the city of London, placed in crowded centers of trade, with an attendant in charge of each, would be a means conducive to health. Much might be done to improve the sanitary condition of the pavements in cities. Any pavement that is not water proof will absorb refuse matter and become a menace to health. The question of disposing of

* Presented at the Waterbury convention of the Connecticut State Association of Master Plumbers, February 6, 1895.

garbage is now occupying the attention of scientists and humanitarians. Thus far, no better, cleaner or safer way has been devised than burning, which not only commends itself as being a sanitary measure, but economical as well, when the health of the people is taken into consideration.

A constant and sufficient supply of good water is of the first importance to every community. A high standard of health can only be attained by a good degree of cleanliness, and cleanliness can only be preserved by a free use of water, and free use does not necessarily mean waste. Water at public drinking places should be carefully filtered and the filters should be cleansed at frequent intervals. The reading and thinking public is already awake to the requirements of sanitation. But what is to be done with those who will not read or think, since there is no law that I know of to compel people to save their own lives? However, I should say place baths and sanitary appliances within the reach of all, and man being an imitative being he will be likely to follow the example of others and thus get the good which he has not the knowledge to demand. Nor do I believe that the construction and maintenance of public baths in the tenement house districts by cities would add greatly to taxes. The first cost would be considerable, but the returns in lessened expense of maintaining almshouses and prisons would be something. Nothing is so expensive as crime, and filth tends to degrade, and degradation leads to crime. Cleanliness stimulates self respect and tends to good citizenship. If we make laws to restrain and prevent crime, why not also furnish means to elevate and purify character?

The introduction of the study of hygiene into the public schools will in a few years bring about desirable practical results. It has been said that a plumber cannot afford to be a reformer. Is it true that our profession is to us but a matter of dollars and cents? Have we then no interest in our fellow man except to find our way neatly and directly to his purse? Shall we allow such a stigma to rest upon us? Let us stamp out whatever of avarice and ignorance in our ranks may have led others to believe that we are not at heart just as desirous of progress and reform in the plumbing trade as any critic could wish us to be. Then, having conquered, let us place ourselves in the vanguard of humanitarians and be heard loudly knocking at the doors of legislative halls, urging the passage of such laws as will compel men—landlords and plumbers alike—to consider the health of the communities which they desire to serve.

In some places the aid of the law has been invoked, chiefly through the efforts of Health Boards and plumbers, to oblige a compliance with such sanitary conditions as will best secure the health of the people. Let us unite in the endeavor to carry the good work still further and aim to secure such legislation as will oblige all persons engaged in plumbing work to be thoroughly and practically qualified to do their work in a manner to prevent disease and preserve health. When all plumbers make united effort to uphold only the best work, then, and not till then, will our trade become an honorable profession.

The examination of those who wish to do plumbing, by a competent board, and their registration, together with the issuance of certificates to those candidates who passed satisfactory examinations, would, no doubt, secure almost immediate improvement not alone in sanitary methods, but in the execution of the work. A plumber should understand not only the practical part of his work, but the theoretical part also, and be able to give a sufficient reason for the construction of every part of his work. To quote the language of another: "As the wave of popular interest in plumbing is sweeping over the land, I would strongly advise the young apprentice to put forth his best efforts to acquire a full and complete knowledge of the craft, and not to rest satisfied until he can not only give a satisfactory reason for every process of his work but also illustrate it with his pen and pencil."

Much poor material is now to be found in the market and many people resort to the penny wise method of using it, consoling themselves with the reflection that, after all, it may wear just as well as the more expensive. This is a kind of logic that appeals powerfully to some persons who put up houses to rent, but experience is teaching them that the putting in of poor material must always result disastrously in the end, both to the health of the tenant and the purse of the landlord.

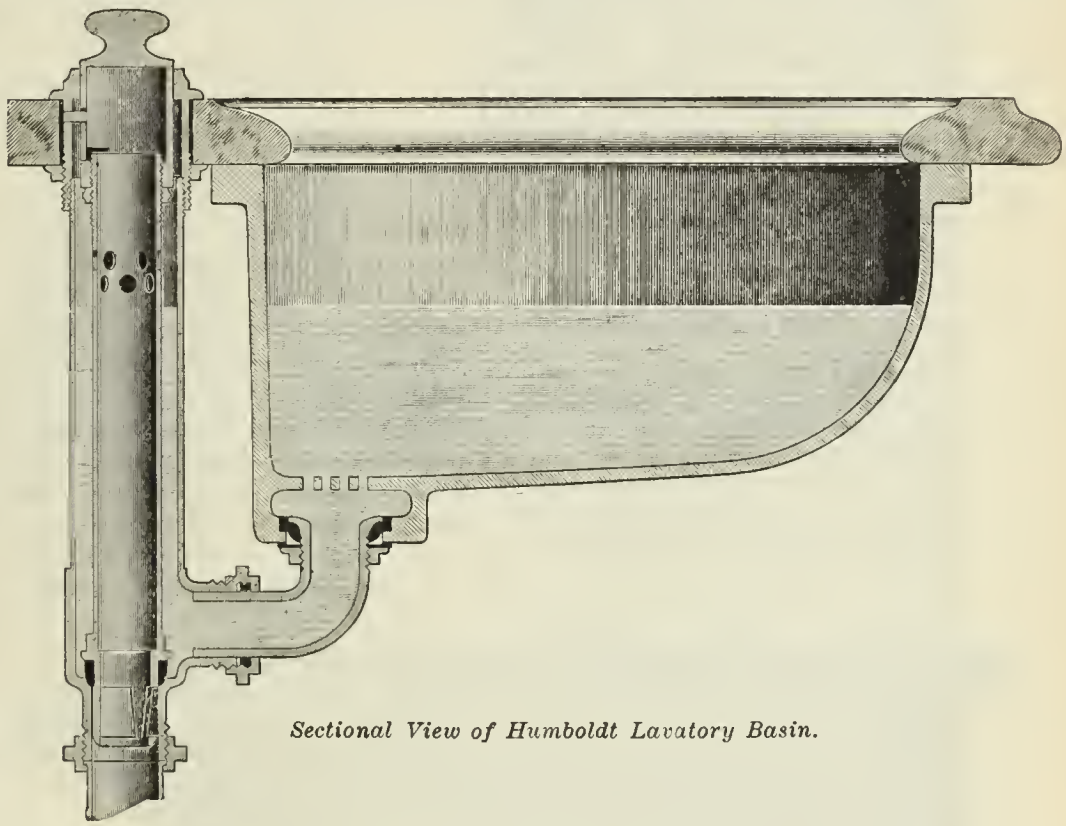
The Humboldt Lavatory Basin.

The sectional view herewith given shows the Humboldt lavatory basin, made by Sumner & Goodwin, 21 Oliver street, Boston, Mass. The basin, it is stated, has no nickel plated work exposed in the fixture, and consequently there is no tarnishing or wearing away of the metal. A particular advantage to which attention is directed is that there is very little surface between the perforations at the bottom of the basin and the waste at the back to foul. The disagreeableness, if not absolute danger, of a large fouling surface between the fixture and the trap is becoming more and more recognized, and the reduction of this surface so far as possible is an advantage that will be generally appreciated.

T. F. Mullarkey, Gloversville, N. Y., has resumed the plumbing business at the place formerly occupied by the firm of Mullarkey & Senior.

New York Master Plumbers.

The annual ball of the Association of Master Plumbers of the City of New York was held in the Lexington Avenue Opera House on February 12. The committee of arrangements, John Yule, Thomas J. Cummings, Thomas J. Tuomey, Charles Schloesser and Milton Schnaier, provided a very enjoyable entertainment for the early part of the evening with quartettes and solos. An impersonator appeared as Gen. Geo. D. Scott, John Price, T. J. McCormack and Alderman J. G. Collins in quick succession to the amusement of these gentlemen and the audience. Among the guests were John Mitchell, president of the National Association of Master Plumbers, United States Marshal J. H. McCarthy and Wm. P. Mitchell from New York; Thomas H. Radcliffe, Wm. J. Gault, E. McDonald and H. M. Noble from Brooklyn. All of the guests were accompanied by ladies as were the members, and after the entertainment the orchestra began an elaborate dancing programme. The ball was opened by John Yule. The members present with their wives, daughters and friends were: Milton Schnaier, chairman of the Floor Committee; Henry G. Gabay, Thomas F. Gaynor, J. G. Collins, C. Tucker, I. Brown, J. Tuomey, T. R. Delacey, J. M. Morton, Gunstave Staats, Charles Beck, Benjamin Chambers, Paul Euell, Leonard D. Hosford, David Kennedy, Abraham Levon, James Muir, William McDermott, James McEntee, H. J. Pattison, I. Reynolds, John Regan, John J. Sullivan, William Young, William Bryan, Thomas F. Byrne, Samuel Cameron, Peter Carroll, T. J. McCormack, P. J. Carpenter, T. J Cummings, J. P. Knight, J. Ryan, J. J. Delehanty, P. Green, Jonas A. Rossman, John Byrns, Alexander Bryant, James R. Corbitt, Walter G. Gersty, C. H. Kranichfelt, William Kirchhof, Josiah Lindsay, Samuel Malcolm, John F. McKeon, Joseph O'Brien, William H. Quick, John Rinehan, Michael Ryan, John Tucker, Paul S. Bolger, Oliver Barratt, Benjamin Chambers, J. A. Chambers, L H. Stroh, P. J. Andrews, William R. Bracken, Philip Brady, Alexander Cameron, John Boyd, James Gilroy, William Vail, Adam Huston, George W. Flood,

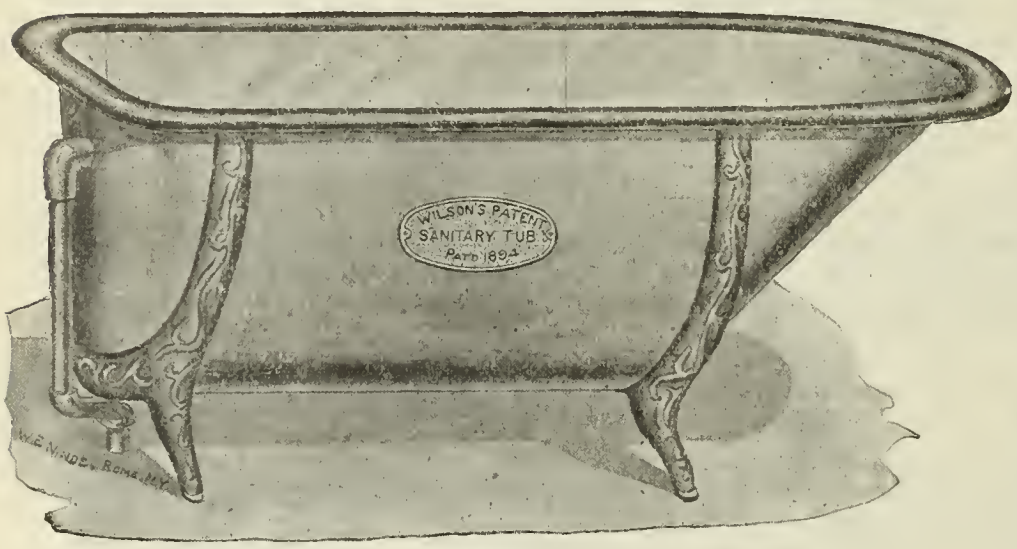


Sectional View of Humboldt Lavatory Basin.

John Spence, David Jackson, Thomas Brady, J. H. Connolly, John S. Dunn, Ferdinand Ehrhardt, Frank Eberhardt, William Forster, James Fay, John H. Graham, John F. Muir, William Messer, James O'Brien, Charles A. Walsh, Thomas J. Tuomey, J. M. Sullivan, B. J. Smith, Frank Flanagan, Patrick Brady, Thomas J. Byrne, Francis Callaghan, Colin Campbell, George D. Scott, James N. Knight, John Ford, John Hindley, William Martin, John Miller, George B. Brown, James Armstrong, William J. Crow, Paul G. Decker, Thomas Ennis, George F. Erfort, Cauldwell Fraser, Benjamin Forster, Edward Murphy, Edwin A. Moody, William Montgomery, John D. Page, Charles H. Treat, John Smith, Charles Schloesser, Michael Hughes, Bartholomew Donohue.

A Copper Bathtub.

A new sanitary fixture that has just been put on the market is an all copper bathtub, shown in the accompanying picture, made by R. M. Wilson, Rome, N. Y., and displayed at the New York showroom at 92 Walker street. The tub is made of heavy weight sheet copper, so that it sustains the weight of the water and the bather without affecting its shape. It is claimed that a heavy man may jump into it without damage to the tub. On the inside the tub is heavily tinned, while the outside shows the copper in its natural color, under a coat of durable lacquer, presenting an attractive appearance. The tub may be painted any color and decorated to suit its surroundings. It is supported on ornamental cast iron legs that are bronzed. Each tub is supplied with a fixed waste and overflow, and is adapted to the use of standard bath cocks. Wood rims of any wood required are provided. The tub is placed on the market at a price that should prove popular, and being an exposed or open work fixture it has much to recommend it in appearance and cleanliness.

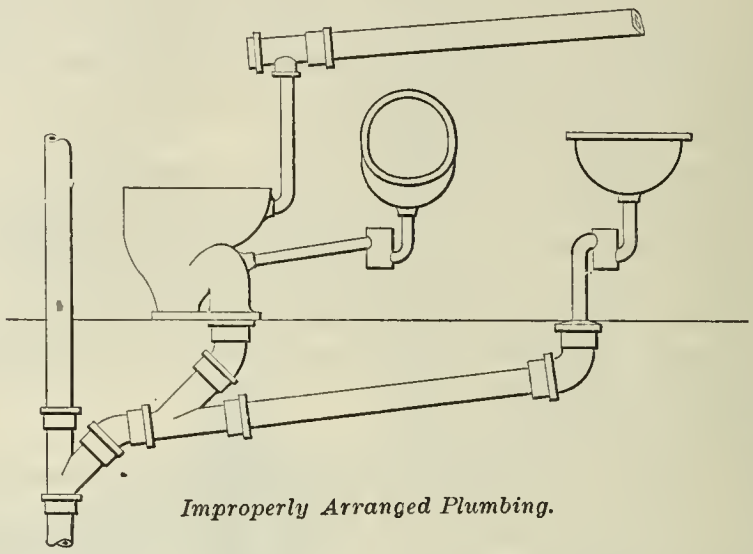


A Copper Bathtub.

Improperly Arranged Plumbing.

From F. A., *Connecticut.*—I send you a rough sketch of plumbing work that has just been completed in a new building. It will be seen that the waste from the urinal runs into the trap vent of the water closet and that the traps are not ventilated. The seat vent runs into a flue. I should like to know if this can be called correct plumbing?

Answer.—The system shown is open to many criticisms. In some sections the seat vent is never used, while in others it is connected with a heated flue. It is generally considered that a first class job of plumbing should have its traps ventilated. A novel economy is effected by connecting the urinal waste with the closet, as shown, but it would not be considered good practice. In the sketch the soil pipe is shown continued to full size to where the basin waste connects with it. This should not be. The soil pipe should be reduced to the size of the basin waste immediately after receiving the water closet waste. The waste from the urinal should connect with the waste from the basin. By the use of a pipe of the size of the waste of these two fixtures, a good flush will be insured each time the fixture is in use. If there are no fixtures attached to the vertical soil pipe above those shown in the sketch, it may be used as a vent pipe. A separate pipe, the same size as the waste used with the fixture, should be taken from the top of each trap and carried to a point that is higher than the fixture, and then run over and connected with the vertical soil pipe. If other fixtures are located on this pipe above those shown, the air pipe must be run above them to the soil pipe or carried through the roof.



Improperly Arranged Plumbing.

TRAPS AND VENTS.

THE PLANT now under erection by the Victor Mfg. Company, at Blairsville, Pa., is nearly completed. The new concern will make a full line of porcelain enamel baths and enameled sanitary ware, also enameled specialties of every description. Their plant will be a very complete one, and will include pattern shop and foundry. The concern received five acres of ground and a cash bonus from the citizens of Blairsville in consideration of their locating the plant at that place.

THE ECONOMICAL GAS GOVERNOR COMPANY have been incorporated at Chicago with a capital stock of $250,000. The directors are Abijah O. Cooper, Frank C. Farnum and Edward L. Bradbury.

REPRESENTATIVE REINOEHL of Lebanon, Pa., has introduced a bill to the legislature at Harrisburg to provide for a "Sanitary Day." The object is to arouse public interest in sanitary science, and through the co-operation of the Superintendent of Public Instruction and the State Board of Health to impress all with the necessity of cleanliness as a means of averting disease and preserving health.

J. BARTON has purchased the tinning and plumbing business of Frank Shay at Pine Plains, N. Y.

FREDERICK WEISS, Chicago, has bought the plumbing branch of Louis Back & Co.'s business.

HERBERT MORRIS and George Shainline, employees of Cowden & Zimmerman will form a co partnership and engage in the plumbing business in Conshohocken, Pa.

A SPECIAL COMMITTEE, composed of Chairman Mowe of the Plumbing Board, City Engineer McComb and Plumbing Inspector Kieff, has been appointed at Watertown, N. Y., for revision and consideration of several changes recommended in the plumbing rules and regulations as laid down by the local plumbing board, as suggested by their examination of the laws in force in Syracuse.

GRAND CROSSING PLUMBING COMPANY have been incorporated at Chicago with a capital stock of $1000. The incorporators are Parke E. Simmons, Guy C. Murray and Ernest Rutishauser.

THE ANNUAL MEETING of the Master Plumbers' Association of Worcester, Mass., was held at the Builders' Exchange last week, and the following

officers were elected for the ensuing year: President, C. C. Reed; first vice-president, C. A. Middlemas; second vice-president, F. J. Briden; secretary, J. J. Crean; treasurer, O. S. Kendall.

GEO. A. FUCHS, Fort Madison, Iowa, has sold out his plumbing business to the Fort Madison Plumbing Company.

W. F. DOWD & Co., Raleigh, N. C., is the style of a new firm who will open a plumbing business. Mr. Dowd comes from Charlotte.

THE PLUMBING SHOP of Charles G. Carmine, Baltimore, Md., was damaged by fire last week.

THE FOLLOWING PLUMBERS of Jamestown, N. Y., have complied with the law and registered with the clerk of the Board of Health: Frank M. Stearns, Carl J. Berry, Martin J. Murray, Charles T. Taylor, Fred E. Underwood, George A. Chatfield, John F. Smith, Jonas Woodhead, John Conway and A. A. Stewart.

THE ANNUAL CONVENTION of the Master Plumbers' Association of the State of New York will be held in Troy, N. Y., Thursday and Friday, March 7 and 8, and the committee appointed by the local association are now busily engaged making the arrangements. The convention will probably be held in Harmony Hall, and the first day's proceedings will be followed by a banquet.

D. J. CARROL, President of the Alberene Stone Company, has been in Chicago for a few days.

WILLIAM W. GRAY has recently started a plumbing and heating business at Chatham, N. Y., with a full assortment of plumbing fixtures and Bolton Heaters.

THE ANNUAL CONVENTION of the Master Plumbers of Rhode Island was held at Pawtucket last Thursday. John Trainor of Baltimore and one of the executive committee of the National Association of Master Plumbers was one of the guests.

THE FIRM of Haage & Tomney, Reading, Pa., plumbers, will be dissolved after April 1. The business will be continued by Mr. Haage.

A BRANCH of the well-known firm of Crawford & Young, plumbers, of 321 Warren street, Boston, Mass., has been established at 18 Post Office square, Roxbury, Mass., formerly occupied by J. H. Baguley, plumber.

C. H. GREEN, South Bethlehem, Pa., had a slight fire at his plumbing shop last week.

THE MASTER PLUMBERS' ASSOCIATION of Salem, Mass., met last week and elected the following officers for 1895: President, F. A. Wendell; first vice-president, E. G. Kelley of Peabody; second vice-president, D. S. Ingersoll of Beverly; secretary, James Trow; treasurer, J. F. Andrews.

THE PLUMBING WAREHOUSE of Leighton, Davenport & Co., Bangor, Me., sustained considerable damage by fire last week.

J. G. YOUNG, hardware dealer, Bellevue, Iowa, has added a plumbing department to his hardware establishment, and would like catalogues and price lists from dealers in plumbing supplies.

JAMES GRAY, East Albany, N. Y., was a visitor at *The Metal Worker* office this week. Mr. Gray is the patentee of an extension sink bracket, and manufactures a number of plumbers' cast iron specialties.

IN THE LAST ISSUE of *The Metal Worker* we alluded to the formation of the John W. Mills Company, 100 Lake street, Chicago, to do steam and hot water heating work, but omitted to state that they would also follow the business of contracting in ventilating work and sanitary plumbing.

THE E. STEBBINS MFG. CO., Brightwood, Mass., send a calendar upon which attention is called to their extensive line of brass faucets. These are referred to as being of the highest grade and as adapted to use in modern plumbing.

THE PLUMBING ESTABLISHMENT of W. S. Molo, Dubuque, Iowa, was visited by fire last week.

THE NEW FIRM of Carter & Co., plumbers, have their offices in the Reich Building, Brighton street, New Brighton, Pa.

W. A. FAUST, 3 Cron street, Pittston, Pa., is a new plumber, steam and gas fitter in that city.

EDWARD P. WILLIAMS, a member of the firm of Williams & Calhoun, plumbers, Amsterdam, N. Y., died last Saturday evening of typhoid fever.

PLANS have been completed for a four-story brick factory on American street, below Columbia avenue, Philadelphia, for Fleck Bros., manufacturers of plumbers' materials. The building will have a frontage of 22 feet on American street, and will extend back 132 feet to Philip street. A siding will be laid into the building from the Reading tracks, and the factory will contain improved machinery.

GOULD & NOWLEN, Bath, N. Y., will open a branch plumbing establishment at Hammondsport in the near future.

THE FOURTH ANNUAL CONVENTION of the Ohio State Association of Master Plumbers will be held at Columbus, commencing on February 26 at 10 a.m. Smith's hotel will be the headquarters.

Massachusetts Master Plumbers.

The seventh quarterly convention of the Massachusetts State Association of Master Plumbers was held in Boston on February 12. The business meeting was held in Elks' Hall, and was followed in the evening by a banquet at the Crawford House, which was one of the most enjoyable events in the history of the State Association, it being characterized by a thoroughly representative gathering of the members of the craft, an elaborate dinner, charming music and timely speeches. The convention which preceded it was notable for the large attendance and the many important matters acted upon. The principal feature of the meeting was the discussion and denouncement of the efforts now being made by certain parties to change the present plumbing laws of the State. These attempts were declared dangerous to the public welfare and the interests of the plumbing trade.

It was 6 o'clock when the delegates and guests filed into one of the large dining rooms of the Crawford House. There were about 200 master plumbers present. David Smith, president of the local association, sat at the head of the table, having on either side the invited guests, among whom were Capt. John S. Damrell and leading representatives of the plumbing trade, manufacturers and dealers. An orchestra rendered delightful music during the banquet. When cigars were lighted President Smith called the gathering to order and extended a cordial welcome to the visiting delegates. He then introduced as the first speaker John Trainor of Baltimore, ex-president of the National Association.

Mr. Trainor, who was received with prolonged applause, made a timely speech, dwelling upon the merits of the association and what it had accomplished since its existence.

The next speaker was Daniel G. Finnerty, one of the best known men in the plumbing trade.

Capt. John S. Damrell spoke for Boston. He complimented the association on the showing and the progress it had made, and was given three cheers when he had finished.

Other speakers were president Mitchell, Wm. Lumb and Wm. Locke. One of the best speeches of the evening was that made by James F. Davlin of Somerville, whose remarks sparkled with wit and allusions to several master plumbers present. Daniel Shannon, secretary of the State Association, sang a song for the "boys," which was loudly applauded. Brief remarks were made by other representatives of the trade from all over the State, and the banquet was brought to a fitting close with the singing by all present of "Auld Lang Syne."

THE GILBERT & BARKER MFG. COMPANY are about to move their New York office to 82 John street, where, in addition to the Springfield gas machine and their line of gas appliances, they will have something new to show that will interest plumbers. It is a gas water heater which is intended to take the place of a waterback and boiler, and can be connected with the water service pipe under any pressure. By opening and closing any of the faucets on the hot water service the heater is lighted and water at 120 to 130 degrees is delivered at the rate of 1 gallon per minute.

The agricultural interests of Florida have experienced a crushing loss by the almost unexampled freeze of last week, following on that of six weeks ago. The best authorities estimate that 75 per cent. of the orange trees in the State have been killed, with two-thirds of the pineapple plants and nearly all the early vegetables. Altogether the loss to growers on the peninsula is computed to be not less than $15,000,000. Next year's orange crop, which was estimated at 6,500,000 boxes, will not, it is predicted, fill more than 100,000 boxes. California has escaped the cold wave, and her orange yield of about 2,800,000 boxes will accordingly bring the growers a handsome profit.

The value of merchandise exported last week from the port of New York shows a gain of $2,400,000 over that of the previous week, when it touched the lowest point for the past two years. It was also considerably above the figures for the corresponding week of 1894, but the comparison with import figures exhibits a heavy balance of foreign trade against this country.

Austin Corbin, the railroad magnate, has, it is said, arranged to colonize 4000 acres of land in Chicot County, Ark., with Italians.

STEAM AND HOT WATER.

Mechanical vs. Natural Ventilation.

BY F. B R.

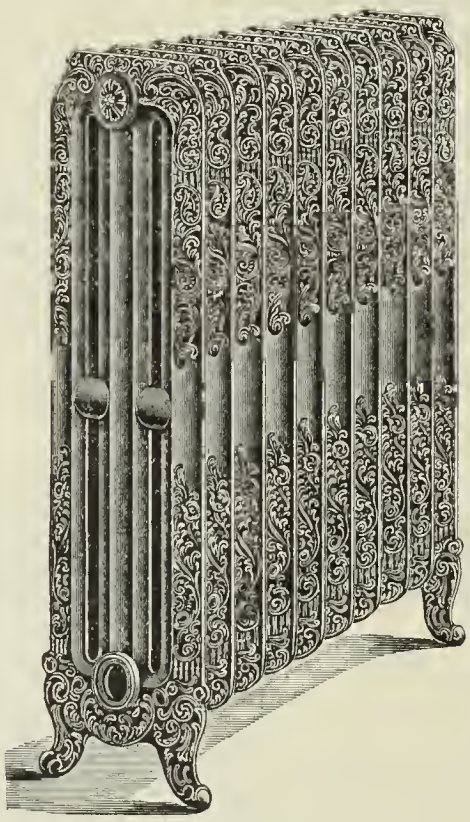
The relative efficiency of mechanical methods of ventilation in which a fan is almost universally employed, and natural systems which depend for their action upon accelerating coils, is not generally appreciated. The losses in the process of making steam in the boiler, of transforming it into work in the engine, and therefrom developing the necessary air movement by means of the fan, are serious and the actual efficiency of the combination is very low. So low, in fact, that one who has not investigated the subject would hardly believe it possible that the blower is nevertheless the more economical of the two means named above. The operation of moving air by natural methods, by its very simplicity, is deceptive. Nothing can apparently be freer from complication than the process of heating air by means of a coil within the flue, thereby decreasing its density and creating an air movement from the apartment outward, because of the difference in the weight of two columns of air by equal hight. It is upon this basis, however, that the capacity of a flue is determined, for it may be readily calculated from a knowledge of the internal and external temperatures, the hight of the flue and the temperature within it.

Under practical conditions the expense of moving the given volume of air may be best expressed in heat units. Thus, for instance, may be measured the steam condensed in an ordinary accelerating coil, for, knowing the increase in temperature of the air volume, we may readily inform ourselves regarding the number of heat units required therefor, and the consequent condensation of steam, the sole source of this heat. Likewise the actual power required to directly drive the fan may be ascertained, which, duly corrected for the losses of efficiency in engine and fan, may be easily expressed in heat units and compared with the expenditure for an equal air movement by the accelerating coil. Relative efficiencies between fan and coil will vary greatly with the necessary difference between flue and outdoor temperatures to produce the desired result by the so-called natural method. If this difference is slight the efficiency of the flue will approach nearer to that of the fan, but under all practical conditions the fan will be found to produce the given movement of air with from one-tenth to one-twentieth of the heat expenditure necessary with an accelerating coil. The heat added to the air in the flue in order to produce its movement is all deliberately wasted so far as heating is concerned, for it is supplied to the air after it leaves the apartment and is thrown away with it. The fan, however, may be applied as a portion of the heating system of which the other can form no direct part and compel the discharge of air from the building by the pressure maintained within.

In almost any case a fan blower can be purchased and installed, not including motive power, for less than the cost of the accelerating coils it would displace. It combines within itself the capacity of all of the individual coils without the inconvenience of their separation and the difficulties of their proper operation. Of course the fan cannot be utilized in small buildings, owing to the usual lack of motive power and proper attention, but its advantages should certainly not be overlooked in those structures where ventilation on a large scale is desired.

The St. Louis Three-Column Radiator.

The illustration presented herewith shows the St. Louis three column radiator for steam and hot water, made by



The St. Louis Three-Column Radiator.

the St. Louis Radiator Mfg. Company, Union Trust Building, St. Louis, Mo. It is the specialty that the company are pushing, and they direct special attention to its handsome appearance, the design being in the Rococo style, as shown in the illustration. Particular claims are made for a large heating surface per section and the small amount of water it carries. The radiators are made in from 3 to 30 sections, measuring from 7½ to 75 inches. They are made in hights of 38, 32, 30, 26 and 20 inches, the three-section 30-inch radiator containing 12¾ square feet of heating surface. The width of the sections is 9 inches.

C. R. Meres Mfg. Company, Norwalk, Ohio, are about putting on the market an apparatus which can be used for either steam or hot water in portable or brickset form. It is of the water tube construction, and arranged to secure either a direct or indirect draft. The construction provides for an easy cleaning of the flues, and the heater is said to be very sensitive to the fire.

Ventilating Schools.

BY SAMUEL HEINS, RONDOUT, N. Y.

Reading over *The Metal Worker* of February 2 I see an article on Heating and Ventilation of Public Schools, written by T. J. Waters of Chicago. I would like to say a few words on the subject of ventilation of public schools, something which is of great importance for the benefit of the pupils and teachers. How many schoolhouses are thoroughly ventilated. I have invented a plan by which schoolrooms and all other rooms may be ventilated without any draft, and which distributes fresh air all over the room. This is a subject that all builders should give their especial attention to. How many children are sent home sick from school by inhaling the polluted atmosphere of unventilated schoolrooms, which I consider is the deadliest poison they could swallow. This subject excites much interest, and, as I said above, I have invented a plan which does away with drafts without any expensive appliance. It is extremely simple and cheap, and it continually renews the atmosphere without being felt by the occupants of the room. Two ordinary panes of window glass are placed in the upper frame of one or more windows, as follows: One pane, the outer one, is placed in the sash and held in place as usual by glazier points and putty. The only difference from an ordinary pane is that it is about 2 inches too short and raised that much from the bottom, leaving the lower edge free and being held in place by the end and the two sides. A second pane, the inner one, is placed against the molding of the same sash, which is always wide enough to admit of its being used for this purpose. This glass is also cut about 2 inches short, but is adjusted so that the open space is on top. This pane is held in position by the lower edge and the two sides. The space between the two panes should not be less than ¼ inch. It is, however, regulated by the thickness of the frame work and the depth of the inner molding. The inner pane should be movable and so arranged that it may be taken down and replaced rapidly and without danger of breakage. This result is arrived at by placing over the edges of the inner pane a light U shaped rubber rim, which is arranged to have sufficient adherence to keep the pane firmly in place. The inner pane thus protected is then put in place, and secured to the molding by means of small clamps attached to the frame by small screws. For medium size windows two clamps near each corner and one clamp on each side near the center. It may be that the pane should be cut so that the rubber rim rests against the frame, then by special clamps the pane is held firmly in place and cannot rattle or break. This system of ventilation, with its parallel glass panes and opposite openings, di-

rects a continuous stream of air vertically toward the ceiling of the room, which accounts for the excellent results of this contrivance, and ventilates or airs a room without the least draft. By this arrangement all the pure air needed is secured and there is no foul air left in the room. The inmates do not have langour, headache or lassitude of body. I would recommend that boards of education adopt this simple method. The expenses would be very little and it would save the health of teachers and pupils. I hope this will be given space in your valuable paper for the benefit of the public.

Determining Heating Power of Heating Systems.

From SUBSCRIBER, *Winnipeg, Manitoba.*—In *The Metal Worker* of January 26 I notice a paper read by J. H. Kinealy before the American Society of Heating and Ventilating Engineers, on the heating power of heating systems, and as it is a topic of general interest to the trade I thought another method might be of interest to your readers. The following method is one which the writer has used with fair success for some time past.

Given a room 15x10x10 feet, with 25 square feet of exposed glass and 250 square feet of exposed 8 inch brick wall, to heat from zero to 70° above with an average temperature of 200° in the radiators, providing only one change. On calculation we find that this room requires about 7786 units of heat per hour to maintain its temperature at the required standard. The heat units emitted per square foot per hour by direct radiators. temperature 200°, with air in room at 70° quiet, are stated to be 246.13, so that 7786 ÷ 246.13 = 31.6, the number of square feet required to heat this room thoroughly.

After installing the system as based on the above calculations, we find we cannot get weather colder than 10° above zero, and with this temperature we determine to test the system. Again taking the same room, but to heat from only 10° above zero to 70° above, we find that it requires only about 6674 units of heat per hour. But we have already placed in this room 31.6 square feet, so that we will now have to maintain this radiation at a temperature sufficiently high only to emit 6674 units of heat, the amount necessary to warm the room; 6674 ÷ 31.6 = 211.2, the number of heat units each square foot of radiation will have to emit per hour. By referring to text books on heating we find that 211.2 units of heat are emitted per hour by water at 185.1°, so that 31.6 square feet of radiation at a temperature of 185.1° should heat the air in this room to 70° (external air 10° above zero), which if it does is all that is required of the system, and is a guarantee that it will heat to the conditions on which the calculations for its installation were based. Although involving a great deal more calculations than Mr. Kinealy's method, still it may be of some use to your readers. The result as obtained by Mr. Kinealy's method, as shown in Table I is 182°, a difference of 3.1° between the two methods.

PROFITABLE TRIPS to Washington, D. C., are made by John I. Leitch, manager of the New York office, at 206 Centre street, of the Standard Radiator Company, Buffalo, N. Y. He spent a part of this week there talking radiation with satisfactory results.

HEATING NOTES.

AT 89 CENTRE STREET, the New York office of John A. Scollay, 74 Myrtle avenue, Brooklyn, a variety of Y's, T's, three way Y's and special fittings for greenhouse work are displayed. A neat rack supports pipe from 1¼ to 4 inch, showing the Scollay pipe joint, which can be used for the insertion of a new piece of pipe without the use of threads or couplings. Literature on the Scollay boiler for greenhouse heating is conspicuously displayed.

T. C. JOY & Co., Titusville, Pa., issue a notice to the trade that their new price list took effect February 1. They call attention to the fact that they have added to their already large assortment of radiators the Zenith, which they expect to be able to furnish by April 1. While advocating the flue type of radiator, they mention that those who desire the ordinary loop type can be supplied with the Orient loop apparatus.

THOMAS W. WEATHERED'S SONS are now comfortably settled at 141 Centre street, New York, displaying the Weathered hot water apparatus and greenhouse structural work. They have been delayed by the cold weather in the completion of the conservatory and heating plant for Senator Palmer at Larchmont. The changes made in the smaller sizes of their boilers in the fall have proven of advantage and popular with the trade.

PRESIDENT JOSEPH BOND of the American Radiator Company, Chicago, called at the New York office this week previous to embarking on the steamer "Teutonic" for Europe.

THOMAS E. CRONE Eastern manager of the American Boiler Company, at 94 Centre street, New York, was elected second vice-president of the company at the annual meeting, recently held at the main office in Chicago.

THE NIAGARA RADIATOR COMPANY, Buffalo, N. Y., are issuing a new radiator price-list the feature of which is the new goods mentioned. They are offering a new direct-indirect radiator and a new pin indirect radiator. They say that orders placed with them can be filled promptly and that their low radiators have proven very popular. The price-list can be had by those who have not received it, on application.

CLARENCE WOOLLEY, treasurer of the American Radiator Company, Chicago, is spending a few weeks in New York lending a helping hand at 92 Centre street. The Eastern headquarters has done a large trade during the last season.

THE HOLLAND RADIATOR & MFG. COMPANY, 69 Centre street, New York, are showing a new column radiator having alternate side connections between the loops instead of the usual straight through central connection. They have received from Blake & Williams, South Fifth avenue, New York, an order for 11,000 feet of this radiator. George Aspinwall is now visiting the trade in the interest of the company.

CHARLES ARMSTRONO, secretary of the Armstrong Mfg. Company, Bridgeport, Conn., has assumed entire management of the company's business of making pipe cutting and threading hand tools and machinery. H. E. French, the former manager, resigned the position and has been elected secretary of the Acme Shear Company of the same city and will superintend the manufacture of the Acme line of scissors, shears and tinners' snips and shears.

THE HERENDEEN MFG. COMPANY have removed their Western office from 131 Lake street, Chicago, to a large and commodious store at 52 Dearborn street, where their Western manager, A. G. King, expects to show a large line of Faultless Furman boilers, radiators and steam fitting supplies.

W. M. MACKAY, 211 Water street, New York, manager of the steam and hot water department of Hart & Crouse, Utica, N. Y., spent the week in New England in the interest of the line of Royal steam and hot water heaters.

GEORGE C. BLACKMORE of the United States Radiator Company, Saltsburg, Pa., will spend a few days among the trade in New York next week. He will have something new in a flue radiator to show.

W. F. COZZENS, St. Louis, has received a communication from T. M. Finney, for whom he installed a No. 56 Royal hot water apparatus, stating that he has satisfactorily heated 69,000 cubic feet of space when the mercury was from 11° to 17° below zero.

MAINS are to be laid in the streets of Terre Haute, Ind., by a company who will furnish steam for heating buildings. The exhaust steam from the electric light plant and street car company's boilers is to be used. The manner in which the pipes are protected from loss of heat and condensation of the steam is as follows: First there is a cast iron pipe of about 6 inches in diameter. This is covered with some kind of a patent wrapping and over all is drawn a hollowed pine log.

Southern Freight Rates.

The Louisville & Nashville Railroad Company have issued pig iron division tariff No. 36, taking effect February 1, giving rates on pig iron from Southern furnaces to points North and West. The rates to the more important points are given below:

To \ From	South Pittsburg, Tenn.	Chattanooga, Tenn.	Birmingham, Ala., District.	Sheffield, Florence, Decatur, Ala., Rockdale and Napier, Tenn.
Alliance, Ohio	$2.88	$2.95	$3.45	$3.20
Anderson, Ind	2.65	2.75	3.00	2.75
Atchison, Kan	4.39	4.50	4.50	4.05
Belleville, Ill	2.39	2 50	2.75	2.30
Buffalo, N. Y	3.43	3.50	4.00	3.75
Chicago, Ill	2.90	3.00	3 25	3.00
Cleveland, Ohio	2.88	2.95	3 45	3.20
Cincinnati, Ohio	1.67	1.75	2.25	2 00
Davenport, Iowa	3.30	3.40	3.65	3.40
Decatur, Ill	2.70	2.80	3.05	2 80
DeKalb, Ill	2.90	3.00	3.25	3.00
Denver, Col	9.08	9.19	9.19	8.74
Des Moines, Iowa	4.92	5.03	5 23	4.83
Detroit, Mich	2.92	3.00	3.50	3.25
Duluth, Minn	4.77	4.85	5.10	4.85
Evansville, Ind	1.88	2.00	2.25	2.00
Hamilton, Ont	4.03	4.10	4.60	4.35
Indianapolis, Ind	2.50	2.60	2 85	2.60
Johnstown, Pa	3.73	3.80	4.30	4.05
Joliet, Ill	2.90	3.00	3 25	3.00
Kansas City, Mo	4.39	4.50	4.50	4.05
Massillon, Ohio	2.88	2.95	3.45	3.20
Milwaukee (all rail)	3.35	3.45	3 70	3.45
Milwaukee (rail and water)	2 95	3.05	3.30	3.05
Niles, Ohio	2.98	3.05	3 55	3.30
Pittsburgh, Pa	3.43	3.50	4.00	3.75
Salt Lake City, Utah	16.85	16.96	16.96	16.51
Springfield, Ohio	2.23	2.30	2 80	2.55
Springfield, Ill	2.85	2 95	3 20	2.95
St. Joseph, Mo	4 39	4.50	4.50	4.05
St. Louis, Mo	2.50	2.60	2.75	2.30
St. Paul, Minn	4.60	4.70	4.95	4.70
Superior, Wis	4.77	4 85	5.10	4.85
Terre Haute, Ind	2.40	2.50	2.75	2.50
Youngstown, Ohio	2.98	3.05	3.55	3.30
Zanesville, Ohio	2.68	2.75	3 25	3.00

The rates apply to carloads of not less than 17½ tons.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

The Checkley House at Prout's Neck, Maine, is to be remodeled at an expense of $20,000 and to be supplied with a steam heating plant.

C. S. Eames, Bridgeport, Conn., has the contract for plumbing J. S. Nash's house at Seaside Park and remodeling the Atlantic Hotel, also the plumbing and heating of E. T. Kirkland's house in New London.

The new residence of A. J. Hoyt, Norwalk, Conn., is heated by hot water, the plant being put in by the Bridgeport Steam Heating Company. The plumbing was done by the Jones & Hotchkiss Company.

The New England Engineering Company, Waterbury, Conn., are to erect a five-story building that will be heated by hot water.

Fleming & Co., Brattleboro, Vt., have begun putting in the plumbing and steam heating apparatus at the new Holden & Martin factory.

E. W. Peck & Co, Birmingham, Conn., have secured the contract for placing a heating apparatus in the new residence of D. Bedient of Seymour.

At a meeting of the Court House Board of Toledo, Ohio, last week, it was decided to advertise for bids for heating the new Court House from plans which they approved.

William F. Comfort, Norristown, Pa., has secured the contract for plumbing and gas fitting in the house to be erected by School Director George B. Kite.

Robert Morgan, New Haven, Conn, has the contract for the plumbing in the Masonic Home at Wallingford.

The contract for heating and ventilating the Pullman Memorial Church at Albion, N. Y., was obtained by Hays & Falls, the well-known contractors at 290 State street, Rochester. The system of heating is that of indirect low pressure steam. There are two 20 horse-power horizontal steel tubular boilers, connected so that one or both may be used.

Charles Kostlevy, 218 West Eighteenth street, Chicago, has the contract for plumbing in the flat building of F. H. Linka, 974 South California avenue.

Davey & Schumacher, 454 Lincoln avenue, Chicago, have the contract for plumbing in the flat building of Charles A. Born, 401 Addison street.

Otto W. Herrmann, 419 West Fullerton street, Chicago, is to do the plumbing in the flat building of F. Sigman, 235 Linden street.

G. M. Hawtree & Co., 6822 South Halsted street, Chicago, are to do the plumbing in the residences of Mrs. C. F. Crosby and M. A. Frasser, 1509–1511 Dakin street.

E. B. Kaiser & Co., 161 Southport avenue, Chicago, have the contract for plumbing in the store and flat building of J. Bobel, Henderson and School streets.

Herzog & Killian, 2226 Archer avenue, have the contract for plumbing in the flat building of P. J. Busa, Forest avenue, near Thirty-sixth street.

James J. Evans, 4346 State street, Chicago, is to do the plumbing in the residence of K. Thielin, 4721 Atlantic street.

Arthur J. Keefe, Vincennes avenue, near South Halsted street, Chicago, is to do the plumbing in the residence of O. E. Hough, 8616 South Morgan street.

William C. Bletsch, 1216 Belmont avenue, Chicago, has the contract for plumbing in the flat building of B. J. Regnall, 644 North street.

The John F. Alles Plumbing Company, 233–235 Lincoln avenue, Chicago, have the contract for plumbing in the flat building of Charles A. Ashlerland, 1833 North Halsted street.

William S. Verity, 229 West Randolph street, Chicago, is to do the plumbing in the flat buildings of Samuel Brown, 120, 145–151 Cosgrove avenue.

Alwin W. Bahn, 393 Gross Park avenue, Chicago, is to do the plumbing in the residence of F. Ztemann, Roscoe boulevard and Northern Western avenue.

Kehm Bros. & Mertz, 289 Kinzie street, Chicago, are to install a steam heating plant in the factory building of Rueckheim Bros., Clinton and Harrison streets.

Daniel Gordon, 562 Forty-fifth street, Chicago, is to do the plumbing in the store building of W. E Spencer. 614 Sixty-third street.

J. H. Bradley, 8026 Vincennes avenue, Chicago, has the contract for plumbing in the flat building of J. D. Horton, 2704–2712 Deering street.

The plumbing contract for the Algonquin Hotel at St. Andrews has been awarded to William Donovan of St. Stephen, Maine.

The handsome residence which Captain P. A. Nickerson is building at Winchester, Mass., will be heated by an eight-section No. 320 Richmond steam boiler, which Edward E. Parker of Woburn will install.

The John W. Mills Company, 100 Lake street, Chicago, will place heating plants in the new residences of C. A. Hull, G. L. Heusner and Edward Davidson, all on the north side.

A. C. Hickey, 69 South Clinton street, Chicago, is overhauling the plumbing work and steam heating plant in the Chicago Athletic Club Building, Michigan avenue.

The Smith & Anthony Company, 219 Lake street, Chicago, are to place a Hub warm air heater in the residence of Charles H. Lawrence, Lake Forest, Ill.

Cook & Chick, 253–255 Kinzie street, Chicago, are to install a steam heating plant in the Lincoln National Bank, North Clark and Michigan streets.

The following plans for the construction of plumbing were filed at Inspector Bemis' office, Providence, R. I., during the week ending February 8, the names of owners being given first, the location next and plumbers last: City of Providence, corner Eddy and Henderson, Phillips & Phillips; P. Peckenham, 51 Lippitt, John S. Wright; Diamond Machine Company, Atwells avenue, R. Richardson; the Thomas Phillips Company, 91 South Main, the Thomas Phillips Company; Peter Simoni, 22 Brayton avenue, James A. Donnelly; Peter Peterson, 62 Glover, John T. McGann; Franklin P. Rand, Adelaide avenue, Charles R. Blackmar; American Brewing Company, Harris avenue and Eagle, D. Holmes & Co.; W. W. Ricker, Pacific avenue and Balcb, E. Frank Carey & Co.; George M. Baker, 83 Page, John J. Shanley.

E. Baggot, 139 Adams street, Chicago, has the contract for plumbing in the Edison Company Building.

Conlon & Montgomery, 33 Dearborn street, Chicago, have the contract for hot water heating in the residence of R. B. McMullen, Evanston, Ill.

M. L. Mandable, 258 Clark street, Chicago, is to do the plumbing, gas fitting and sewerage in the residence of F. Sherman, 547 North State street.

Repairs to the amount of $7500 are recommended to be made to the heating and plumbing systems in two Government buildings at St. Louis, Mo.

A. B. Franklin of Boston has secured the heating contract, and John F. Mulvey, Woonsocket, R. I., the plumbing contract for the new Court House at Woonsocket, R. I.

Bids for heating and ventilating the Court House at Toledo, Ohio, will be receiveduntil March 12; for the powerhouse tunnel and smoke stack until March 27.

The T. M. Lucey Plumbing Company, North Adams, Mass., are doing the plumbing and will put the heating apparatus in "Maplehurst," the summer residence of J. C. Newton at Wilmington, Vt. This company are also doing the plumbing in H. A. Adams' residence in Wilmington.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until March 12, for a low pressure steam heating and ventilating apparatus, including power boiler, &c., for the United States Post Office, Custom House, &c., Building at Jacksonville, Fla. Drawings and specifications may be had from the office of the Supervising Architect, Washington, or from the Superintendent at Jacksonville, Fla.

Bohn Bros. & Kern, Zanesville, Ohio, have secured the contract for the plumbing, gas fixtures and steam heating of the Richards-Van Voorhis Block.

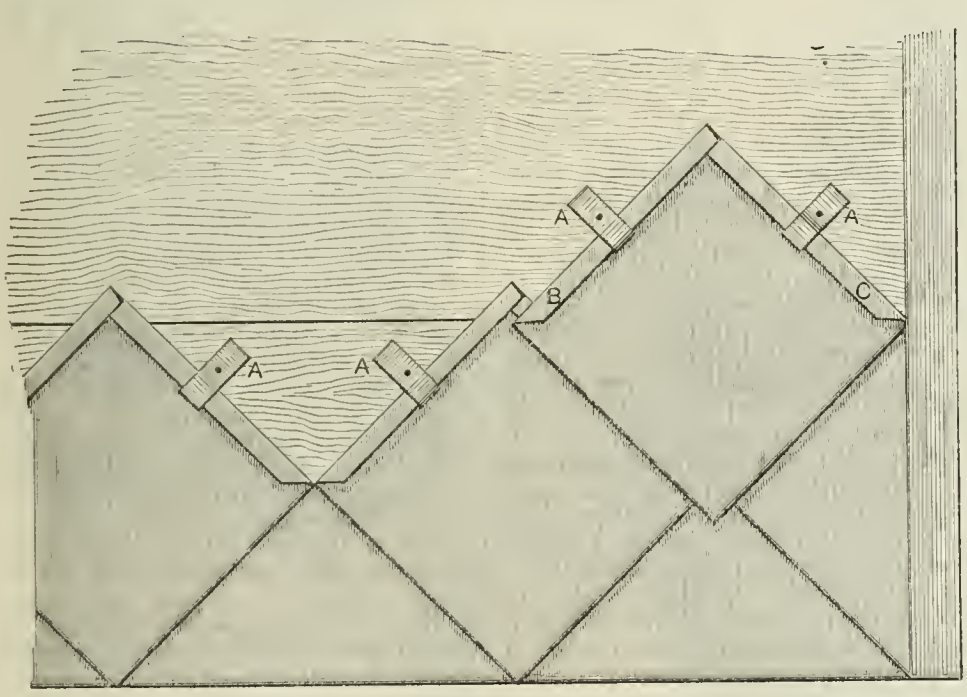
The Correspondence School of Technology, Brainard Block, Cleveland, Ohio, offers courses in applied electricity, steam engineering and transmission of power, surveying and roads, bridges, roofs and iron structures. The faculty of the school comprises a number of well-known engineers, covering all the branches alluded to. The school publishes a valuable little treatise entitled, "Hints to Engineers Operating Small Electric Light Plants," by E. P. Roberts and W. B. Stewart.

William C. Vosburgh, president of the W. C. Vosburgh Gas Fixture Mfg. Company of Brooklyn, N. Y., died of heart failure at his home, 229 Clermont avenue, Brooklyn on February 8, at the age of 68 years. Mr. Vosburgh was born at Hudson N. Y., and went into the gas fixture manufuacturing business in Brooklyn in 1865. He established the company that bore his name, and built up a large business. In 1885 he organized the Brooklyn Gas Fixture Company, from which he retired in 1892. Later he established the Vosburgh & Birkett Gas Fixture Company, with works on Jay street. Mr. Vosburgh was very prominent in Republican circles and also socially. He leaves a wife and one daughter.

ROOFING AND CORNICE.

Looney's Zinc Shingles.

We illustrate herewith the zinc shingles manufactured by Looney & Co., Nevada, Mo., who have applied for a patent on them. Comparatively little interest has been taken in this country in the application of zinc for roofing purposes, and this adaptation of the material is therefore particularly noteworthy. The shingles have been put to practical trial, and Messrs. Looney & Co. advise us that they laid 103 squares of them on the new Public School Building at Webb City, Mo., and five squares on the Webb City Milling Company's building, where they have been thoroughly tested with satisfactory results. The shingles at present are made from No. 12 zinc, and when laid are 12 inches square. The ordinary form of the shingle is square, as shown in the illustration, while for tower work the shingles are diamond shaped. The sheet metal is cut 14 inches square and the laps turned 1 inch each side, making, as above stated, the finished size of the shingle 1 square foot. In the accompanying engravings Fig. 1 is a section of roof with the shingles in place. A, A, A are cleats which hold them down, the end of the cleat being turned over the lock of the shingle. B and C, Fig. 1, show the upper lock. In Fig. 2 the view of a single shingle is presented, illustrating more clearly the locking arrangement. The upper locks B′ and C′ correspond with B and C in Fig. 1, while D and E are the flanges or locks on the bottom of the shingle, as shown by the dotted lines. The width of the flanges is 1 inch, and the shingles are laid with ⅛ inch play in the lock, so as to allow plenty of room for the contraction and expansion of the metal. The principal trouble, it will be remembered, with zinc has been its great variation at different temperatures. For this reason ample provision is made in the shingle illustrated. When laying the shingle on the roof the lock E, Fig. 2, will engage with lock B, Fig. 1. As each shingle is put in place it is fastened by the cleats A A. The manufacturers especially refer to the way the upper corner is folded, which, it is claimed, is done in such a way as to keep out all water that may be driven up under the shingles.



Looney's Zinc Shingles.—Fig. 1.—Showing a Section of Roof.

Slate Items.

A SLATE MILL in Bangor, Pa., is working on an order for 4000 feet of finished slate to be used as shelving in a public library at Chicago. It is the first known order of the kind.

THE SLATE SHIPMENTS from the Slatington, Pa., section during the week ending January 5, as reported in the *News*, were: 1768 squares roofing slate, 604 crates blackboards, 503 crates school slate, 6 bundles, 50 crates and 178 pieces flagging.

THE Great Bangor Slate Company of Bangor, Pa., have been incorporated with a capital stock of $25,000.

IN REFERRING to the slate industry in that region, the *Pen Argyl Index* says: "The slate shipments from all sources in the Pen Argyl section in December, 1894, were: 91 carloads roofing slate, 2 cars and 119 crates slate slabs, and 273 crates blackboards. The total shipments of slate products of all kinds for the Pen Argyl quarries in 1894 were: 1519 carloads and 71 boxes roofing slate, 33 carloads and 1013 crates mill stock, 2 cars and 2109 crates blackboards, and 1 car school slate. The volume of business done at the various slate quarries and factories in Pen Argyl during the year 1894 shows a slight increase over that of the year 1893, which is an indication that the business is slowly reviving and that we may soon look for a restoration to the prosperous condition of affairs of 1892—the banner year for the slate industry."

FLASHINGS.

THE EIGHTH ANNUAL CATALOGUE AND PRICE LIST just issued by Rhodes, Dickelman & Co. of Forest, Ohio, is an attractive publication of 84 pages, bound in paper covers of deep green, carrying an embossed side title in old gold. Since the last edition of their catalogue was issued the company have reorganized the business, enlarging their working capital, adding several new departments and making sundry improvements in old ones, thus placing them in a better position than ever before for supplying the demands of the trade. In the early pages of the publication reference is made to the fact that the company's double fold lock seam, Struble's cap seam, standing pressed seam and roll and cap roofings, except when otherwise specially ordered, are made of genuine steel and not of iron. This steel is made specially for the company, being rerolled, box annealed and free from scales. The painting is done upon the grain of the metal, hence the makers claim it will not crack or peel off. The metal is thoroughly inspected and all imperfect sheets thrown out, the utmost care being maintained throughout. The goods illustrated and described cover a varied assortment, and in addition to the lines above mentioned include cluster tiling or shingles, clap or weather boarding, siding, sheet steel pressed brick, beaded and corrugated iron, patent slip joint reversible eave trough hangers of various kinds, corrugated expanding conductor pipe, elbows, rain water cut offs, roof gutters, ornamental ridgings, crown moldings, finials, ventilators, metallic cresting blocks, roof paints, &c. An interesting feature of the volume is found in the rules of measurement in selling sheet metal building material, and also rules for measuring after the material is applied to the building. There are also given suggestions to be observed in ordering goods.

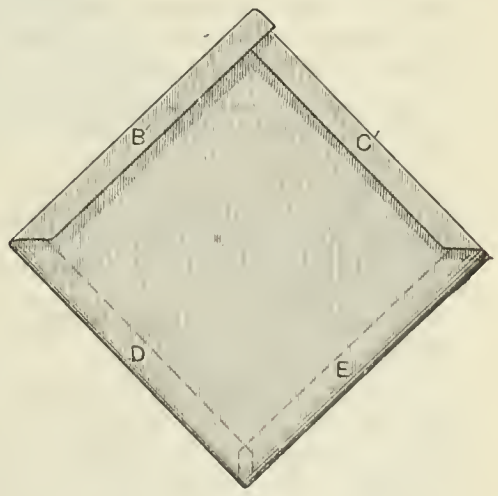


Fig. 2.—View of Shingle, Showing Locks.

GUMMEY, SPERING & Co., Philadelphia, in a recent communication, call attention to their special brand of "Waldo" hand dipped ternes. This is a brand which the firm introduced to the roofing trade over 15 years ago, and

it has, they state, gained a great reputation throughout the country. They are now making these plates at their own tin plate works in Philadelphia, and are keeping them up to the same high standard of quality. They are referred to as American plates in every particular, including the iron and the labor employed in coating them.

The John Siddons Company of Rochester, New York, are now laying the Spanish tile and doing the copper work on the valley and gutters of the handsome new depot of the New York Central Railroad at Syracuse, New York.

Wagner Bros., 1350 Diversey street, Chicago, Ill., have signed contracts for copper cornice and red slating for A. Waldman's residence on Diversey street, near Park avenue ; copper cornice and galvanized iron work on F. Sulling's three story flat and basement building, at 1715 Diversey street ; galvanized iron work for C. P. Steffenson's building, Gross Park avenue and School street.

The American Roofing Company, St. Louis, report a good trade, and state that their January business showed an increase of over 50 per cent. in comparison with the corresponding month of last year. They report the Texas and coast trade as being particularly heavy. The Cincinnati factory of this concern is also well supplied with orders.

Sanitary Security Company.

The Sanitary Security Company, with main offices in the Lincoln Building, 1 and 3 Union Square, New York, have been organized under the laws of the State of New York to provide for the sanitary inspection and guaranteeing of buildings in the interests of either landlords or tenants. Naturally the real efficiency of such a company will depend upon the intelligence and trustworthiness of those having its work in charge. It is of especial interest therefore to note the number of emlnent and well-known names comprised in the following list of officers and directors:

President, James C. Bayles, Ph.D., Past President Health Department, New York City.

Vice Presidents, George E. Waring, Jr., C. E., Commissioner of Street Cleaning, New York; Joseph H. Raymond, M. D., Past Health Commissioner, Brooklyn, N. Y.

Secretary and Attorney, Edward A. Sumner.

Treasurer, George R. Percy.

Technical Consulting Staff : Sanitary Engineers, George E. Waring, Jr.; Waring, Chapman & Farquar. Bacteriologist, T. M. Prudden, M. D., Chief Department of Pathology, College of Physicians and Surgeons, New York. Chemist, Charles F. Chandler, Ph.D , Past President Health Department, New York. Engineer of Heating and Ventilation, A. R. Wolff, M. E.

Of Counsel, Sullivan & Cromwell.

Directors: J. C. Bayles, George E. Waring, Jr., Richard S. Treacy, W. H. B. Totten, Hon. Darwin R. James, Jos. H. Raymond, M. D.; Edward A. Sumner, Fredk. M. Dean, Geo. R. Percy.

The company offer their services to owners of real estate and to tenants, and their claims are clearly set forth in the circulars they issue, the one addressed to the owners of real estate reading as follows:

The endless and vexatious contention between landlords and tenants over the sanitary appointments of leased buildings, involving questions which neither understand and concerning which it is difficult for either to obtain wise and disinterested advice, is the cause of much expense and annoyance to owners and of dissatisfaction to tenants. This contention is as unnecessary as it is undesirable. It is, moreover, expensive. As a rule the owner of real estate understands, or at least appreciates, his moral and legal responsibilities as a landlord and has no wish, by his negligence, to expose his tenant to risk of life or health. It is because he does not know, in most cases, how to discriminate between reasonable and unreasonable complaints, and has no convenient and trustworthy means of advising himself how to protect his own interests and serve those of his tenant at the same time, that necessary repairs and replacements are so often neglected and unnecessary expense so frequently incurred. If the landlord is complaisant and obliging he is apt to be imposed upon—if the reverse the tenant is likely to make him as much trouble as possible. Much of the apparent unreasonableness of tenants is due to the fact that they are unintelligently apprehensive of dangers from supposed sanitary defects and attribute every illness and indisposition in their families to "sewerage poisoning." If, however, the tenant knows that his landlord is doing all that is right and proper, under competent and disinterested professional advice, and that every complaint he makes is given prompt attention, he will, as the rule, be satisfied and feel perfectly safe. When the sanitary care of a rented building is assumed by the Sanitary Security Company of New York, the owner is relieved of all further annoyance from complaints by tenants. If complaints of the condition of his premises reach him he refers them to us. If repairs or replacements are necessary, they are recommended; if not, the owner may safely decline to make them. Tenants are often very careless, and sometimes maliciously destructive of rented property; and their persistent violations of the provisions of the sanitary code frequently entail much trouble and expense to the owners before reletting is possible. Tenants can be required to take much better care of rented premises than they often do, and owners will thus be saved a large part of the annual cost of maintenance of rented property. Owners suffer much annoyance and loss from the vacation of houses by tenants, who allege the unsanitary condition of the premises as an excuse. This company will not guarantee rents, but in the case of buildings under their care they will, at their own cost, prosecute the owner's suit against a tenant vacating for this cause, and if they cannot get judgment against the tenant, will indemnify the owner for any loss he may suffer in consequence of such vacation. If the owner has put his building in a condition satisfactory to this company, and we become responsible for it, we will either vindicate him by getting judgment against the tenant, or we will indemnify him for loss of rent. The Sanitary Security Company of New York desire that the value of the service they offer to owners of property shall be judged solely by the standard of economy. We can save the owner of real estate many times the cost of employing us, and we can materially assist him in securing, satisfying and retaining desirable tenants for desirable buildings.

The services they offer to occupants of rented buildings are explained as follows:

The worst conditions encountered in sanitary inspection are found in rented buildings. However well built originally, they are almost always found to have deteriorated during successive occupations until, from frequent patching and general neglect, they reach a condition which is a constant menace to life and health. If it were our purpose to create a popular panic the record of facts resulting from the sanitary inspection of rented dwellings, apartment houses, hotels and business buildings in and near New York would furnish ample material. As the rule, dwellings and places of business are hired with little or no inquiry as to their sanitary condition. If any questions sre asked the answers cannot be expected to give information of value. The most dangerous defects in the sanitary condition of a building are not those likely to attract notice. What the tenant knows of the sanitary condition of a building he usually learns from experience after he has moved in, and this knowledge is sometimes gained at very serious cost. The Sanitary Security Company place at the command of tenants of all classes of buildings the means of guarding against original mistakes in selecting unsafe dwellings or places of business, and against such dangers as may result from the negligence of landlords in keeping their property in repair as to sanitary appointments. As the rule, we prefer relations with owners, as under such relations all interests are best served; but in many cases the tenant is forced to adopt measures of self protection against the negligence of the owner or his representative. When such conditions are found to exist we will undertake the protection of the tenant by all legal and proper means. Under a contract with a tenant, we first make a thorough sanitary survey and inspection of the building he occupies. When conditions are found which involve danger to life and health, we undertake to move promptly in his interest and to exhaust all means for having such conditions remedied. We will hold the owner as closely to his responsibilities as the law permits, and will do all that can be done to protect the tenant. If at any time the premises are found in such condition that, in the judgment of our experts, they are unsafe for occupation, we will advise the tenant to move out; and if on our advice he follows this course, the Sanitary Security Company will defend any suit brought against him for rent after such vacation, and pay whatever the landlord may recover judgment for—provided, of course, such judgment shall not be for rent during the tenant's occupation. Our responsibility in the matter of rent does not begin until the tenant has vacated unsafe premises by our advice. We further undertake to protect our tenant clients, so far as practicable, against injury from remediable external nuisances. Under a contract with a tenant we will make four thorough inspections of his premises each year, and as many special inspections as may be warranted by the information he furnishes. So long as his house is under our care he may be sure that everything practicable is being done for his protection.

THE RETAIL STORE.

Empire Spraying Pumps.

Field Force Pump Company, Lockport, N. Y., are offering the spraying pumps shown in the accompanying

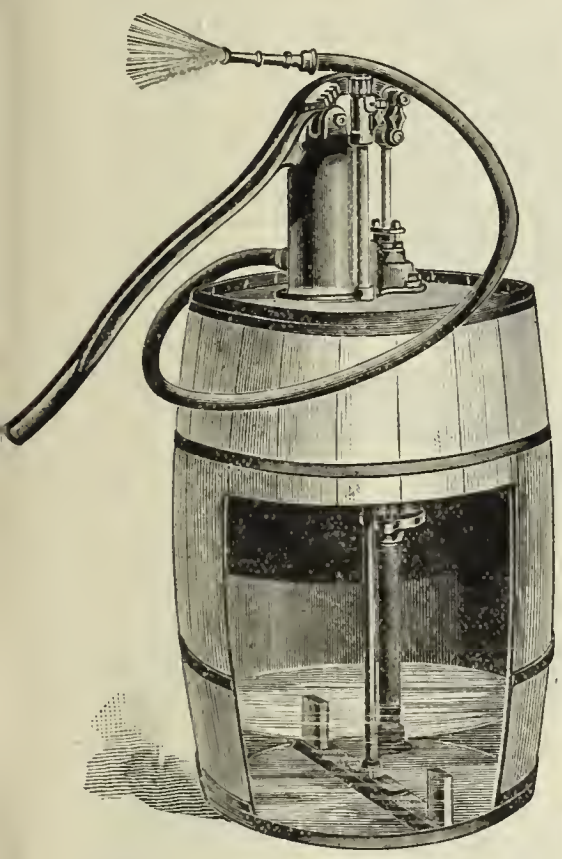


Fig. 1.—Empire Queen Spraying Pump.

cuts. The Queen pump, Fig. 1, has a seamless brass cylinder, with brass plunger snd brass rod; also a brass



Fig. 2.—Empire King Spraying Pump.

screw spout, to which the hcse is attached by a screw coupling. It is explained that the pump has a large air chamber, by means of which the spray is strong and continuous; also that 5 feet of hose and the company's graduated nczzle are furnished with the pump. It is further explained that the agitator works in connection with cogs from the lever, connecting with a companion gear at the upper end of a steel shaft, at the lower end of which is a horizontal wooden bar. Thus when the lever is moved upward or downward the agitator bar travels, it is stated, in a semicircle in the bottom of the barrel, and prevents the poison from settling. The pump is furnished with a suction pipe, which is provlded with a fine brass strainer at the lower end, to effectually prevent leaves or dirt from gettlng into the pump or nozzle. The manufacturers claim that the pump works easily, and it is guranteed in every respect. The King pump, Fig. 2, is similar to the Queen, but larger. It has two Eureka spraying nozzles, with which two rows of trees or vlnes may be sprayed at the same time. The seamless brass cylinder is 8 inches long, having brass plunger snd rod, and brass screw spout with a stop cock. It also has two 10-foot sections of heavy hose furnished wlth couplings which can be joined, making one continuous hose 20 feet in length. The pump is provided with the same kind of mechanical agltator as the Queen, a large air chamber and a tight cap for closing up either opening of the spout when but one nozzle is used. It is stated that the suction pipe is of galvanlzed iron, with a brass strainer, and that the pump has a long lever.

Rochester Mammoth Fount.

The Rochester Lamp Company, 42 Park place, New York, have brought out the New Rochester mammoth fount, as here shown. It embodies some of the essential features of the New Rochester table lamp, fully illustrated and described in these columns November 29 last. It has a thumb-screw wick lift, which can be operated from either the top or under side of the fount. The wick is lifted with a rotary



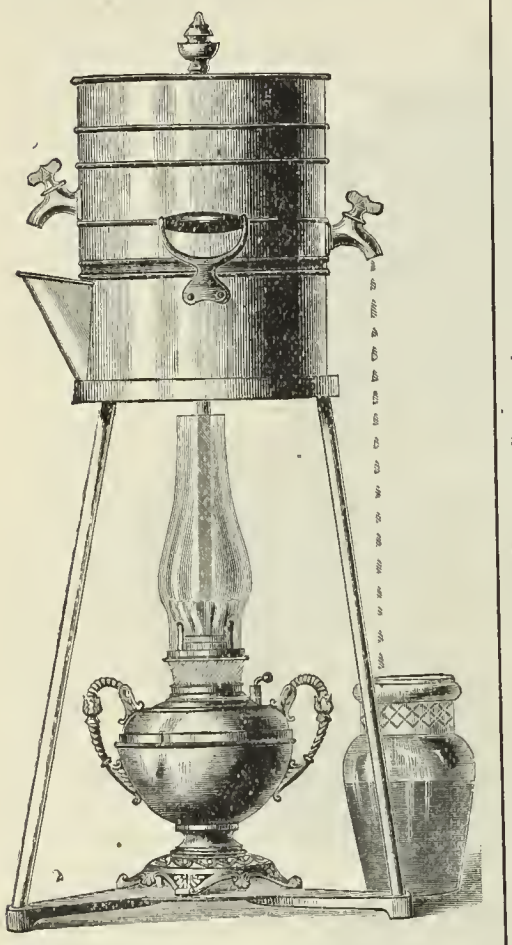
No. 10 Rochester Mammoth Fount.

movement by means of a toothed wheel fixed rigidly to the center of the rcd connecting the two circular thumb screws, giving a gradual and positive motion in raising or lowering. The teeth of the wheel engage a perforated wick lift. In lighting, the frame holding the chimney can be ralsed by operating the lever seen at the right, without removing the chimney. A larger inlet for oil is another advantage over the fount formerly made. The gallery (or top part) is screwed in, and by carrying the perforated metal up close around the wick tube there is now no dirt pocket and no chance for odors from refuse and wlck cllppings. The New Rochester double over cone is used, whlch gives a double clrcular flame and, it is said, a llght equal to 400 candle power. A perforated wick lift is used, whereby the draw bar, with sleeve and wlck, can be taken entlrely out of the lamp. The fount ls furnished in brass or nickel, ls 10¼ inches high from bottom to top of burner, holds a full gallon of oil, and wlll burn,

it is said, 10 to 12 hours. This fount is designed largely for stores, offices, churches, &c., where large volume of light is demanded. They can be hung in harps or swung in brackets.

Browne's Water Still.

A device for the convenient distillation of water for drinking purposes is that shown in the accompanying illustration. It is being manufactured by F. E. Browne of 314–316 South Spring street, Los Angeles, Cal. As shown in the engraving, the device consists of a stand, supporting an ordinary oil lamp, above which is the metal still. The latter consists of a boiler, having a conical cover around which projects a rim, forming a reservoir, which holds a supply of water to cool the cover and cause the steam which rises from the water

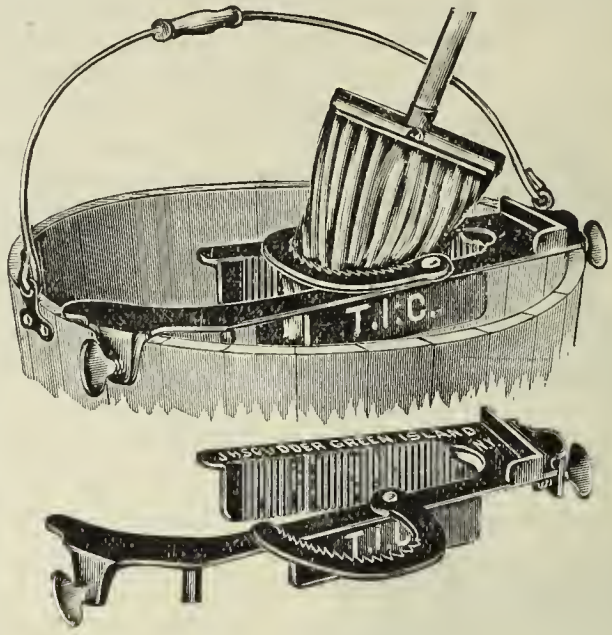


Browne's Water Still.

within the boiler to condense on the under side of the cover. By an ingenious arrangement the condensed water is collected and discharged through a faucet into a suitable vessel, as shown in the engraving. In its fall through the air the water is said to become thorougly oxygenated. The still complete is 12 inches high, 9 inches in diameter and weighs 5 pounds. It is made of copper, tinned on the inside and nickel plated on the outside. The manufacturer guarantees this device to distil 1 gallon of water in three hours, and states that greater rapidity would prevent a thorough oxygenation of the water. The stand supporting the still and lamp consists of a tripod, with the lamp support arranged to slide up and down the legs and to be secured at any hight so as to accommodate a short or tall lamp at a sufficient distance from the bottom of the still in order to secure the best results. Both the still and lamp attachment are portable and may be readily taken apart or put together. Mr. Browne refers to this device as a practical, ornamental still, which is effective in use, reasonable in price and can be used upon any kind of stove, or in connection with the lamp which furnishes the light for evening work or pleasure, thus giving, without additional expense, a supply of pure water for the next day's use.

The T. I. C. Mop Wringer.

The illustration herewith shows the T. I. C. mop wringer recently put on the market by the Torrance Iron Company,

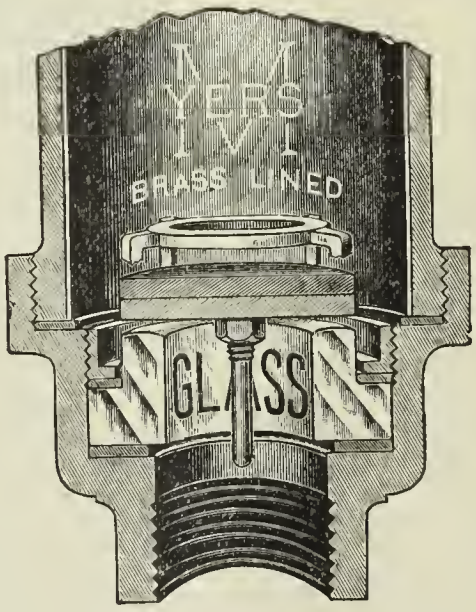


The T. I. C. Mop Wringer.

Troy, N. Y. It is a malleable casting that is adapted for securing to a pail by set screws. In use the mop is placed in the slot and the swinging piece swung around it. Then, by twisting the mop to the right and upward, the water is effectually wrung out of it. During the operation the pail and wringer are held by placing the foot of the user on the slot plate.

The Myers Improved Drop Valve.

F. E. Myers & Bro., Ashland, Ohio, are using the drop valve in connection with the glass valve seat in their pumps, as shown herewith. The glass



The Myers Improved Drop Valve.

seat is underlaid with a rubber gasket and is held firmly in place by a brass follower, drawn up tight, thus holding the glass seat in a reliable manner. The point is made that the valve seat is independent of anything else, and that it cannot be effected by the swinging of the suction pipe, or become disarranged in taking the pump or cylinder apart. The manufacturers call attention to the fact that the glass valve seat is noncorrosive and is smoother and more perfect than a metallic seat; that it is extremely hard and does not throw off corrosives, and that the leather operating on the glass retains its softness. The company continue to make the glass valve seat in connection with the older form of leather pump valve, hinged at the side, as is generally used by pump manufacturers with a metal valve seat.

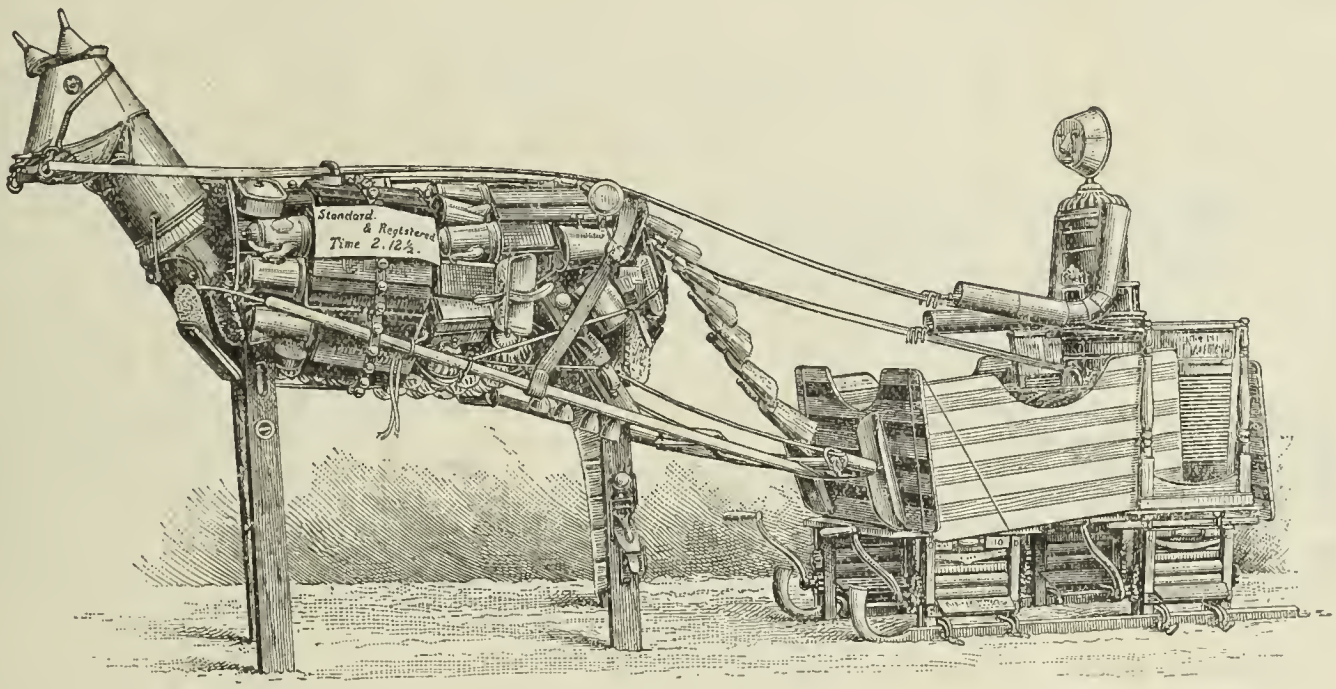
New Enameled Ware.

Maurice Stransky of Stransky & Co., 27 Murray and 31 Warren streets, New York, returned to this city last week, arriving by the "Paris" February 2 from a six weeks' business trip to the Continent. This concern import largely Steel Enameled Ware for house furnishing, kitchen and culinary use. In his opinion the continued reduction in the price of this class of merchandise, necessitating a corresponding deterioration in quality, has been followed by a reaction among many buyers in favor of a higher standard of excellence at some increase in cost. With this in mind he has brought back with him a series of nine samples for dealers' and salesmen's purposes, resembling in shape miniature wash basins, all 5 inches in diameter. These are merely to show the various new colors and combinations in this grade of ware. Among those to which he alludes as strictly new are solid Turquoise Blue, Starry Turquoise Blue and a solid Ivory or Elephant Tusk color. The interiors are all solid white. The remaining varieties will be known in the trade as Garnet and White, Cameo and White, Mosaic and White, Inlaid and White and Blue and White for the outside, the inside being solid white. Those to which reference has been made are said to have four separate coats of thin enamel, fired after each application, the fourth coating being the white interior. The ninth variety is a cameo finish over all alike, inside and out. A full line of American shapes can be furnished, including such staple articles as lipped Sauce Pans, Preserving Kettles, Tea and Coffee Pots, Tea Kettles, Wash Basins, Dish Pans and Water Pails, together with all the various smaller articles that constitute a full line. It is his intention to give the

sale of these goods to but one dealer in a town, to provide against ruinous competition, hoping thus to insure a fair profit to all concerned. Only importation orders will be taken, no stock being carried in New York except the last mentioned finish, viz., Cameo inside and out. To those interested a set of the nine samples will be sent from which to make up importation orders, which may be all of one kind or some of each variety.

A Unique Window Display.

Barrett Hardware Company of Joliet, Ill., have shown much ingenuity in arranging the horse and sleigh here illustrated, as a display for their large double show window. The floor of the window is covered with material to represent snow, producing the effect of a winter scene. The body of the horse is made by building a frame of wood about the shape of a horse, putting barrel hoops around it, and then covering it with various Hardware and House Furnishing articles. The head is made of a Funnel Coal Hod, with Oven Door Rosettes for eyes and inverted Funnels for ears. A Pudding Mold forms the lower part of the mouth, and a pair of Scissors and two Hanging Lamp Hooks comprise the Bit. The neck is a Flour Bin, and the body is covered with Tea Pots, Dinner Pails, Sweepers, Crumb Brushes and Pans, Tin Gem Pans and such other articles as will cover the frame. A pair of Potts' Sad Irons were used as terrets for the lines to pass through, the lines being of 1-inch Hoop Iron. For legs Levels and Planes are used, these being lined on the inside with Scrub and White Wash Brushes. The tail is formed of Brush Brooms wired together. The sleigh runners are two Plow Handles, with four Clothes Wringers for standards. An inverted Sewing Table and Lap Boards form the sides, front and back, and Molding Boards are used for the bottom of the sleigh. On the seat an Oil Heater is placed, with a Pan with Tinners' Trimmings soldered to the bottom to represent the face. Conductor Pipe and Elbows form the arms, and Garden Hooks are used for the hands. Two Drain Cleaners are used for thills and a Shovel forms the cross bar, with Ropes for tugs. The company suggest the use of Hoop Iron in place of Rope for the tugs, as they think it would produce a better effect.



A Unique Window Display.

MEMORANDA.

Cobb & Archer, 96 Centre street, have the New York agency for the Syracuse bicycle made by the Syracuse Cycle Company, Syracuse, N. Y. They have secured Gus. T. Berglund, a well-known trainer, as a salesman and look forward to a good trade. Scorching being one of the pastimes of the cycler Mr. Cobb's experience in his other business of steam and hot water heating should enable him to give to his customers some points in making even wheels circulate.

The Ochsner & Orcutt Company, 1012 Fourth street, Sioux City, Iowa, have purchased the business and sporting goods stock of C. E. Ellis of that place, and will add this to their line of general hardware. It is their intention to also do a jobbing business in relay bicycles and specialties. We understand that they propose making their facilities for gun and bicycle repairing second to none in that section, and will solicit work in that line throughout that territory. The company are agents for the Stewart stoves and ranges as well as for the other goods made by the Fuller-Warren Company.

The Scollay Plant Sprinkler, made by John A. Scollay, 74 Myrtle avenue, Brooklyn, and 89 Centre street, New York, for sprinkling plants and flowers, has been pronounced excellent for sprinkling clothes in laundry work. Illustrated circulars can be secured on application.

The firm of Behner & Norton, 530 Main street, Hartford, Conn., have been dissolved, the business to be continued by F. E. Behner at the old stand.

The G. L. Van Namee Mfg. Company, Gouverneur, N. Y., have brought out the Little Giant Steel Truck, for which they claim a number of special advantages. It is simple in construction, made entirely of metal and is designed with a view to possessing great strength. It is furthermore very light, weighing but 14 pounds. The wheels are made with wide tires with carefully fitted bearings. There is a patent adjustable clamp that is said to be a sure and positive grip on a barrel, and can be adjusted to any size of barrel. The finish of the truck is black japan.

Edward Miller & Co., Lamp manufacturers, now have the main entrance to their store at 66 Park place, instead of at 10 and 12 College place, New York, as heretofore. Owing to the widening of College place from Chambers street to Dey street, the buildings on the west side are rapidly being razed to the ground or parts of the fronts being torn down, as the case may be. As only a portion of their present stand has been demolished, as soon as a new front can be built conforming to the changed conditions their entrance will be as before.

The Ohio knock down stove pipe which the Geauga Foundry & Mfg. Company, Painesville, Ohio, are offering is put together by slipping a small metallic cylinder nearly the length of a joint of pipe over the locks, which are turned outward. The manufacturers state that a number of joints of the pipe put together will make a continuous line 46 feet long, if desired, of perfectly firm, smoke tight pipe that will not collapse. The pipe is in ½-inch sizes from 4 to 7 inches and is shipped in crates of 25 joints.

For some time past the Bakers' Unions of New York and Brooklyn have been striving to obtain remedial State legislation to obviate the unsanitary condition of many of the bake shops in these cities. In his official report to the Legislature, State Factory Inspector Connelly, speaking of this evil, says: "Hundreds of the small bake houses are located in damp cellars, where refuse, vermin and foul odors abound. It is stated that the proprietors and workmen in these places have become, perhaps from association, personally as unclean as the quarters they occupy. Many of the shops are used as sleeping rooms by the employees. Vile sanitary conditions and an all pervading disregard of the rules of health and decency are charged against these places, and there is a demand made that they be put under the supervision of the Factory Inspectors, and that stringent regulations be passed concerning them."

TIN PLATES.

Distribution of Tin Plate Imports.

From the British Board of Trade returns we print a table giving the number of boxes of tin and terne plates shipped to various ports of the United States from the port of Liverpool during the last ten years, from 1885 to 1894. These figures do not, of course, include all the exports of British tin plates to this country, large quantities being shipped from Swansea, Bristol and other English ports. But they are instructive as giving an idea of the proportionate distribution of imported plates in the various sections of this country, the plates being generally consigned to the port nearest to the place of consumption. The last column gives the total number of boxes of tin plates shipped to the United States in the same years.

Exports of Tin Plates from Liverpool to United States Ports.

Year.	Philadelphia.	New York.	Boston.	Baltimore.	San Francisco.	New Orleans.	Portland, Maine.	Portland, Ore.	Astoria.	Other ports.	Totals from Liverpool.	Total shipped to U. S. from all English ports.
1885.....	489,725	648,177	171,217	129,397	123,388	17,118	96,558	4,735	38,070	9,078	1,727,463	4,477,380
1886.....	310,035	424,039	228,708	104,376	197,404	40,394	59,780	25,909	57,259	14,946	1,462,850	5,271,709
1887.....	340,395	978,884	203,876	207,013	197,933	31,448	66,378	21,642	25 474	87,856	2,160,899	5,367,280
1888.....	446,546	793,199	241,062	213,681	266,343	38,860	31,898	6,750	10,748	36,025	2,085,112	5,852,460
1889.....	547,854	1,517,820	256,835	206,317	408,910	66,071	40,708	42,818	27,972	41,817	3,237,122	6,733,840
1890.....	392,744	747,594	257,016	347,368	164,744	21,648	65,312	29,087	17,450	31,303	2,074,270	6,362,160
1891.....	271,304	1,358,902	261,872	319,656	287,162	67,979	83,532	8,893	36,986	37,412	2,733,698	6,502,900
1892.....	68,740	499,430	205,664	253,441	282,736	23,584	79,161	18,459	41,480	48,341	1,521,036	5,569,580
1893.....	78,719	326,305	161,206	57,909	369,360	14,600	33,174	6,845	32,505	57,306	1,137,929	5,111,660
1894.....	130,086	254,088	176,186	150,970	186,371	2,517	5,095	14,272	42,713	57,109	1,019,407	4,537,580

Tin Plate in Wales and the United States.

Under the above heading the London *Engineer*, one of the most eminent and reliable technical authorities in England, publishes, in its issue of February 1, the following interesting editorial in regard to the present situation in the Welsh and American tin plate industries:

A noteworthy policy is now being advocated in Wales. Nothing less, in short, than a short life and a merry one for the tin plate trade. Certain manufacturers, and very many of the men, have arrived at the conclusion that the United States are going to make in the near future for themselves all the tin plate they need; that is to say, 75 per cent. of the total output of the 531 mills in the principality. That as a result the Welsh tin plate trade will become extinct, and that under the circumstances the best course to pursue is to raise the price of tin plate 5 or 6 shillings a box, to make in this way a great profit and carry away a legacy left by the dying industry. The idea involved appears to be absurd. It could only, we imagine, originate in the minds of Welshmen. Englishmen would scarcely give up the struggle in a fashion which it is not easy to regard without contempt. Yet the surprising character of the proposition startles us into the doubt that there is something behind it and that those who put it forward are in no sense cowards, but men wise in their generation and resolved to make the best of a bad case. We have taken some trouble to arrive at a knowledge of the facts. The situation is too complex to be dealt with within the limits of a single article. For the present we can do little more than direct attention to its salient features. We may add here at once, however, that we see no reason to regard the policy advocated as anything but suicidal.

Previous to the year 1665 England was exclusively supplied with German tin plates imported from Hamburg. In 1691 a patent was granted in this country for the manufacture of tin plate, and for about 200 years Wales has had a monopoly of the trade, which has grown from a make of 1,000,437 boxes in 1862 to 8,967,580 boxes in 1891. Fostered by the tariff and other causes, the United States began to make tin plates several years ago. Their earlier efforts in this direction failed; but Americans, unlike Welshmen, do not easily accept defeat. In the fiscal year 1892 there were made in the United States 13,646,719 pounds of tin plate; in 1893 the output rose to 99,819,202 pounds, and last year it reached 141,386,508 pounds, or 63,118 tons. It was believed that the abrogation of the McKinley tariff would shut up the United States mills; instead it brought about a demand for a reduction in wages. The American rollers had been earning on an average from $8 to $12, or 32 shillings and 6 pence to 48 shillings and 9 pence per day. The masters proposed $6 or 25 shillings per day. There was a strike, which has closed the American mills for the last three months. The accounts which have reached this country as to the magnitude and importance of this strike are conflicting. In the end the masters appear to have been victorious so far that a couple of weeks since a compromise was effected at a reduction of 15 per cent. instead of the 30 per cent. asked for, and we now hear that fears are being expressed that the output of American mills will be so great that the market will be glutted. Energetic as we know that our rivals across the water are, we venture to think that the fear is the outcome of hope rather than certainty. The situation in the States at present is this. The price of steel tin bar is about the same in the States as it is here. The cost of rolling the bar is greater than it is here; the existing tariff is just sufficient to represent the difference, and place the American manufacturer on the same level as the Welshman. The wages paid to tin plate rollers are high because these men are scarce. But for all the other processes the American manufacturer has learned to dispense by the aid of machinery with high class skilled labor. The following quotation from a letter from an American firm will serve to throw more light on the subject than anything we could write: "It is all nonsense about coal miners, laborers, grocery clerks, &c., being easily trained into the position of rollers, sheeters, doublers, &c. Of course, there is not the union nonsense about it over here that there is in England, but still at the same time it does require skilled labor to roll sheets, as you can spoil more iron, break more rolls, and lose more money in shearings if you have a poor rollerman than any low wages could make up for. It is no easier to roll iron in America than it is in England. We have found that as far as training is concerned we can train a grocery clerk or a boy to run a tinning pot in a few days as well as any full grown Welshman." Furthermore, letters which lie before us show that so far from the American makers finding it necessary to import Welshmen, they are very desirous to get rid of the few that they have, pronouncing them obstinate and slow. Thus, then, it may be stated that the United States are very nearly in as good a position to make tin plates as Wales, the difference in wages being represented by the tariffs and freights. But it must be very clearly understood that this—from an American point of view—favorable state of affairs is due entirely, or nearly so, to the low price of bars. Quoting from another letter, we have the following: "All calculations regarding the ability of the Americans to make tin plates have been overturned by the heavy drop in the prices of billets and bars." And again, "The whole situation is narrowed down to whether the protection given under the new tariff bill of $1.20 on tin plate and $1.22½ on black plate, is or is not enough to protect the Americans in rolling the billet down to the sheet, because that is the only part of the operation that needs protection."

No doubt Wales will have to take account with American competition. The monopoly in tin plate will go the road that England's monopoly in steam engines and cotton went, many years ago. But it is folly to assume that because the monopoly is gone the trade must go too. It is admitted on all hands that the price of iron in the United States is abnormally low. A moderate rise would tell heavily against the American plate mills. But, again, the wages in the States are very heavy, so far as skilled labor is concerned, as we have shown. The Welsh tin plate workers have had to submit to a reduction of 12½ per cent. This may seem a great deal. It is well that what it means should be properly

understood. In ordinary times the roller men earn about £3 per week, or nearly twice as much as a fitter. The work is not exceptionally heavy; nothing like so severe as that of a puddler, for example. In 1874 the high water mark of wages was reached. The trade was never so prosperous. It will scarcely be credited that until last year no change was made, or attempted to be made, in the scale. But, besides this, the unions restrict the make to 36 boxes per mill per shift of eight hours. The result is, that all the standing charges per box are much increased. In the United States the out turn is 50 to 55 boxes in eight hours.

Obviously, it appears to us, the proper position for masters and men in Wales to pursue consists in combining together to defeat the American maker. One of the first things to be done is to steady the market and give the dealers and brokers some chance of doing trade on a sound basis. There is a very well grounded complaint that an exporter now is never sure that the price he pays is the lowest at which he could have bought. "The higgling of the market" is a recognized factor in political economy, but it can be carried to such an extent as to check trade. In the next place, the whole position should be reconsidered—not on a small scale or in a narrow minded way, but very broadly; and a definite figure should be arrived at as representing the price at which plates can be made, leaving a fair but not excessive profit, and that price should be such as to kill American competition if possible, even if it did not represent any profit at all. The representatives of the men should meet the masters, and by discussion arrive at a definite conclusion. The question for consideration is terribly simple. Is the manufacture of tin plate in Wales to be abandoned or continued? To answer this it is essential that the true nature of the United States competition should be known by master and men alike. If it is determined that it is to be abandoned by the existing owners, we may rest assured that others, younger and more enterprising, will take it up and continue it—probably on a smaller scale and under different conditions as to wages and machinery; or a great union of the more powerful mills may be formed to beat the American manufacturer. If, on the contrary, it is resolved that the American shall be fought on the existing lines, then it is for masters and men to combine with that object. As for the union, there appears to be but one course open—it must submit to a reduction in wages and a removal of restrictions which, barely tolerable under a monopoly, are out of the question in a trade fighting for existence. The only certainty at present is that the manufacture of tin plates in the United States is in a fair way to become a great industry, and nothing short of a considerable rise in the price of iron appears to be likely to check it.

The Tin Plate Crisis in Wales.

According to the latest news from England matters in the tin plate trade in South Wales seem to have reached a grave crisis. One-half the works are wholly idle and the rest are only working fitfully. Intense distress naturally exists among the workmen and their families in the tin plate districts owing to the prolonged idleness of so many of the works. The severity of the weather of late has added acutely to their sufferings. Private intelligence received from that quarter describes the hardships endured by the poorer families in the South Wales tin plate districts as being almost unheard of in prosperous Wales. They are in many cases absolutely without the necessaries of life and are starving of hunger and cold. This condition of things involves several thousand men, women and children. As to the outlook no one cares to express any opinion.

Yet, notwithstanding all this, the men's delegates seem determined to prefer complete idleness to the 20 per cent. reduction in their old wages demanded by the manufacturers. Many of the latter express themselves as being willing to resume if this concession and the abolition of the 36 box rule are granted, even if they are only able to make their expenses. Failing this, they explain that they cannot afford to go on making tin plates at a loss and their only alternative is to shut down, which in most instances they have proceeded to do. Nor can they be blamed for their action. With a dwindling trade and prices declining week by week, until the figures touched last week are said, on good authority, to leave the makers with a loss of 15 per cent., it is an utter impossibility for the manufacturers to keep their works running at the old scale of expense. The situation seems to justify the English journals in describing it as the worst ever experienced in the entire history of the tin plate trade.

SCRAP.

J. S TREGONING, proprietor of the well known Morfa Tin Plate Works, Llanelly, South Wales, appears to take a very disheartened view of the prospects for the Welsh tin plate industry. In a recent speech, delivered to his workmen, Mr. Tregoning is reported to have said, speaking of the future of the works, that what they proposed doing was to take stock very carefully and see what had been the result of the trading operations of the past six months. Upon that they would decide whether to continue or close the works. But in the mean time everybody would be paid off. As it was at present they could not carry on the business. It was a mistake on the part of the men to set their faces against improvements, and he believed that unless washmen were disestablished there was a very serious outlook before them. He had an opportunity the other day of selling the Morfa Works to a company, but he did not consider it honest so long as he could not see his way through the difficulty to throw that difficulty upon a company. Even if they had a reduction of 50 per cent. they could not make the works pay.

THE ERECTION of the National Tin Plate Works plant, Anderson, Ind., is being pushed. The main building, 400 feet long, is up, and the engine room is also erected. The works are expected to be in operation by May 1.

THE PROJECTED large tin plate plant to be erected at Washington, Pa., to which references were made in these columns some months ago, appears to be still in abeyance. Plans have been drawn out and the location decided on, but no active steps have as yet been taken toward the erection of the buildings. We understand, however, that the scheme has not been abandoned.

THE WELSH TIN PLATE TRADE, according to a well-known Llanelly manufacturer, quoted in the *Western Mail* of Cardiff, has never been in such a depressed state as at the present time. The Llanelly tin plate makers are only working off present orders, after which they will close their works and wait for an improvement.

HAMILTON, OHIO, will, it is said, soon have a large tin plate works. A company for the purpose is reported to have been organized, and the necessary buildings are to be erected shortly.

THE LOCATION of a new tin plate works at Frankton, Ind., by Cincinnati and Chicago capitalists, is reported to have been decided on. Work on the buildings will be commenced as soon as the weather permits. According to the terms by which a bonus is granted to the company, the plant must be in operation by July 1, working with not less than 350 hands.

FOLLANSBEE BROTHERS' COMPANY, Pittsburgh, Pa., manufacturers of Scott's Extra Coated roofing plates, who have succeeded to the business of James B. Scott & Co., are sole factors for the Blairsville Rolling Mill Company, Blairsville, Pa., manufacturers of tin and terne plate and black sheets. Messrs. Follansbee were for many years the active members of the firm of James B. Scott & Co., and their many friends in the trade will be pleased to know that the new house is meeting with excellent success and their business promises to greatly exceed that of the old firm.

AT THE CLOSE of this week almost all the tin plate works in the United States are in operation.

THE MORTON TIN PLATE COMPANY, Cambridge, Ohio, have placed an order for two five-roll Morewood tinning sets with the Lloyd Booth Company, Youngstown, Ohio.

IT IS STATED upon good authority that the addition to be made to the New Castle, Pa., Steel & Tin Plate Mill will be at least eight mills and perhaps ten, and that when completed the mill will be one of the largest and best equipped tin plate works in the world. A complete system of electrical cranes will be put in.

THE LIMITED PARTNERSHIP heretofore known as Wallace, Banfield & Co., Limited, Pittsburgh, Pa., operating the Irondale Rolling Mills, Irondale, Ohio, and manufacturers of tin and terne plate, has been dissolved. John C. Wallace, Wm. Banfield and W. E. Foale being appointed liquidating trustees. The business heretofore conducted by said partnership will in future be conducted by the above named parties, under the firm name of Wallace, Banfield & Co.

THE AMALGAMATED ASSOCIATION compromise scale has been accepted by the Ellwood Tin Plate Company, Ellwood City, Pa., and the plant of that concern is in full operation. At the present time there are but three concerns in the country manufacturing tin and terne plate that are not running under the above scale. These are: Wallace, Banfield & Co., Irondale, Ohio; U. S. Iron & Tin Plate Mfg. Company, Demmler, Pa., and St. Louis Stamping Company, St. Louis, Mo. The plants of these three concerns are in operation on the scale originally presented by the manufacturers, which called for a reduction of 30 per cent. in wages of rollers and 25 per cent. for heating and doubling.

AN EXPERIMENTAL RUN was made last week at the new tin plate plant of the Monongahela Tin Plate Company,

at Pittsburgh. This plant is located on the site of the old plate mill of the Oliver Iron and Steel Company, and contains nine hot and cold mills. For the present the concern will roll only black plates, while the tinning will be done by the Duquesne Tin Plate Company of Pittsburgh.

The Blairsville Rolling Mill & Tin Plate Company, manufacturers of tin and terne plate and black sheets, have made an arrangement with their employees by which Amalgamated Association scale prices will be paid, but the scale will not be signed. The plant of the above concern is in full operation.

William H. Griffiths, Pittsburgh, Pa., has secured a patent on a process of manufacturing tin plates, which consists in dipping the plate in a bath of molten metal through a layer of sand mixed with oil, and a chemical flux consisting of sal ammoniac and nitrate of zinc. Also in dipping them a second time through a layer of sand mixed with oil or tallow floating on the metal.

The summary statement of imports and exports for the month of December, 1894, prepared by the Bureau of Statistics of the Treasury Department, shows that only 28,313,364 pounds of imported tin and terne plates were lying in the bonded warehouses of the United States on the last day of the year, as compared with 46,725,926 pounds similarly held on December 31, 1893.

The British Board of Trade Returns for January show a great falling off in exports of tin and terne plates from British ports during that month, as compared with the previous month. They were 29,000 tons, against 38,000 tons in December, and 31,000 tons in January, 1894. Exports to the United States in January, 1895, were 18,000 tons, as compared with 24,000 tons in December

Prevention of Smoke in Cities.

The citizens of Chicago have on sundry occasions supposed that the problem of preventing smoke had been solved for them. But they have just as frequently been disappointed. Yet they have not abandoned all hope of correcting this vexatious accompaniment of the general use of bituminous coal. Probably no other city is so persistently keeping up the fight. The city ordinance imposing a fine for smoky chimneys becomes a dead letter after one set of officials has tried to enforce it and failed, but when a new set comes into power the issue is revived and the fight is hotly renewed. The administration now in power has been more persistent than its predecessors. Violators of the ordinance have been prosecuted with greater vigor than before, and those who have been obliged to pay heavy fines have turned to the use of anthracite coal to avoid further trouble. The soft coal interests of the city and State are important and were supposed to be all-powerful, but they have been wholly unsuccessful in attempting to induce or compel the present city authorities to cease their warfare on smoky chimneys. The result is that new lines are now being laid down for the future prosecution of this work.

The new departure consists in the co-operation of the soft coal interests with the city officials. Heretofore they have been wholly antagonistic, the soft coal miners and dealers looking upon the efforts to cure the excessive production of smoke as a crusade against soft coal and a movement in support of the business of their competitors, the anthracite coal dealers. They insisted that smoke preventing devices were a failure, and that, even if soft coal was burned in a way to emit the largest possible volume of smoke, the smoke rolling from a chimney was an evidence of activity and prosperity, and should not be branded a nuisance, especially if the smoke producing coal came from Illinois mines. But the inflexible stand taken by the city administration compelled them to change their tactics, and, at a conference recently held by the soft coal dealers and miners with the authorities, it was found that common ground could be struck on which both could work. The soft coal representatives now acknowledge that a steam plant can be so constructed that it will consume soft coal without the emission of dense smoke. They admit that a very great deal of the smoke nuisance in Chicago is caused by the faulty boiler settings. Therefore they agree that, in order to prevent a reduction in the consumption of soft coal through the enforcement of the smoke ordinance, an intelligent supervision must be established over the installation of new power plants, and the faulty plants in existence must be altered and improved.

The outcome of the conference is to be a new ordinance which will consolidate the several independent bureaus created at various times for boiler inspection, smoke inspection, elevator inspection and the licensing of stationary engineers. It is proposed under this ordinance to permit no one to install a steam plant unless all the regulations of the new department are complied with, and these regulations will provide for a properly constructed plant with sufficient draft and other details necessary for the perfect combustion of coal. Permits for repairs to old boilers will be refused unless the plans are approved by the department. The consolidation of all these bureaus into one department is such a common sense proposition that it is remarkable that it was not done long since. Under an arrangement of this character the responsibility for a chimney befouling the entire vicinity is a comparatively easy matter. If it is the fault of imperfect boiler setting the fact is authoritatively established and the owner is the party to be fined for violating the smoke ordinance. If, however, the plant is properly built, and the engineer or his fireman is careless or inefficient, that fact is established and the engineer's license is revoked, for he is held responsible for his fireman. The soft coal interests will not be discriminated against under such an ordinance, but on the contrary a systematic regulation of steam plants will be introduced which will be of benefit to them by demonstrating the possibility of smokeless or almost smokeless firing with soft coal. At present they are resting under a stigma in every city, which has been brought upon them by the unscientific or unintelligent use of soft coal or by the forcing of power plants beyond their legitimate capacity.

The annual report of the State Mine Examiner of Alabama shows that last year 4,246,736 tons of coal were mined in the State and 9280 people employed, as against 5,270,042 tons and 10,280 people for 1893. The falling off was caused by the coal strike of the summer.

For the first time in 30 years the Delaware River was, on Sunday, solidly frozen over between Philadelphia and Camden, N. J., and people crossed on the ice from shore to shore.

Trade Notes.

The West Side Foundry Company of Troy, N. Y., have issued an illustrated catalogue of stable fittings, &c., which is likely to prove interesting to many of our readers. Among the goods illustrated are Stall Guards of cast iron, crimped wire, wrought iron and square mesh crimped flat iron, Stall Panels of cast iron; also Ventilators and Door Panels, Hinges, Hay Racks, Salt Dishes, Hog Troughs, Hitching Posts, Blanket Brackets, Harness Hooks, Pole Brackets, Stable Gutters and Covers for wood or cement floors, Caldrons, Cuspidors, &c.

The annual meeting of the stockholders of the Novelty Stamping Company, Bellaire, Ohio, was held recently and the result of the year's business was reported as being very satisfactory, although no dividend was declared. The capacity of this concern for the manufacture of railroad and tubular lanterns, stamped ware and sheet metal specialties has recently been doubled, the firm having added to their equipment a No. 14 Bliss press at a cost of $5000. At the present time the firm have sufficient orders on hand to guarantee steady operations for the next six months.

The new addition to the McCullough Iron Company's works at Northeast, Md., is nearing completion. It will replace the building burned some time ago.

The Ansonia Brass and Copper Company, Ansonia, Conn., have leased the factory formerly occupied by the Aluminum Brass and Bronze Company, Bridgeport, Conn.

A big warehouse fire in Louisville, Ky., on Sunday, February 10, involved severe losses to the Louisville Tin & Stove Company, 122 to 128 Eighth street, and Myer, Bridges & Co., hollow ware and wooden ware, 815 West Main street. The losses are said to be entirely covered by insurance.

In their advertising space this week Gummey, Spering & Co., Philadelphia, print a testimonial letter received from Fieber & Holmes, Brookville, Ind., in which they give their experience with Gummey's Anti Pinhole Tin, which they have used for coffee pots and boilers, and have given it remarkable tests with most excellent results. Messrs. Gummey, Spering & Co. have taken much trouble to bring out this plate and are much gratified with the excellent properties it has shown in use.

The firm of Evans & Robertson, Cincinnati, Ohio, have been succeeded by the W. F. Robertson Steel & Iron Company, whose office is in the Chamber of Commerce Building, W. F. Robertson having purchased the entire interest of Charles Evans in the old concern.

G. A. Crosby & Co., 176 and 178 South Clinton street, Chicago, are now carrying in stock a full line of Tinners' Tools, comprising Crimpers and Beaders, Seaming and Grooving Machines, Pipe Formers, Wiring Machines, Turners, Burring Machines, Forming Rolls, Bar Folders, Tinners' Stakes, &c., and Tinners' Small Tools.

STOVE TRADE NOTES.

The Chicago Stove Trade.

Nobody expects to do a very large volume of business at this time of the year. It is midwinter, and although it has been unusually cold throughout the Northwest for the past month, the trade in heaters has not been stimulated. The usual scattering orders have been received, but the wants of the country had been well supplied when winter set in. Protracted cold spells of excessive frigidity may make people buy more coal, but not additional stoves. The dependence of the trade is now on the various forms of cooking apparatus. Cook stoves and ranges are a constant necessity without regard to season. The demand for these has been fair, but manufacturers report a varied experience. Some have done but little—so little that they take a gloomy view of the situation. Their sales are below those of the corresponding period of last year, and they see no basis on which to rest hopes for the future. To them the outlook is bad, and will continue so until farmers get better prices for their produce. But others are much more cheerful. Either their goods are more popular, or they have more energetic salesmen, or they depend less on purely agricultural communities. A refreshing experience is noted in the case of a few houses who have actually received carload orders. These orders may not all have called for very large carloads, but they have been big enough to class in that category.

The various stove foundries in the Northwest are quite generally in operation. But so far as known at this writing, very few, if any, are running full time. Some are on half time and others vary from that up to five days per week. This is due to the stocks carried over from last season. Manufacturers made more stoves in 1894 than they were warranted in doing by the actual condition of trade. But they were anxious to keep their working force organized, or else they were prompted by pure philanthropy to accumulate even excessive stocks in giving their workmen employment so that the latter could provide food for their families. These stocks now prevent the resumption of work on full time, for obvious reasons. If the demand were large enough to move the current output of the foundries the case would be different. It is to be hoped that as the year advances the prospects of trade will brighten, so that fairly full employment may again gladden the hearts of all interested.

It might be supposed that such times as we have endured for the past two years would check enterprise and cause manufacturers to confine their attention to the devising of plans for moving more stoves of the kind they are already making. This, however, is not the case. Designers and pattern makers have not found their occupation gone, but they are still connected with the stove trade and have a goodly clientage. New stoves may not be so numerous this year as they have been in more prosperous times, but nevertheless quite a number of stove companies will bring out notable additions to their lines. Considerable enterprise is shown in the direction of steel ranges. Manufacturers of cast goods are giving increased attention to steel construction, as they perceive a growing fancy for ranges of that character among their customers. It is a curious feature of current trade that notwithstanding the hard times the demand for steel ranges is increasing steadily, although they are as dear, if not dearer, than the best class of cast ranges. It appears to be the ambition of housewives to own a steel range when one of their neighbors thus furnishes her kitchen.

The St. Louis Stove Trade.

In view of the extreme cold weather prevailing throughout the section tributary to St. Louis the natural supposition is that the stove foundries would be running full turn to fill the demand. Such, however, is not the case. Inquiry reveals the fact that retailers have bought very sparingly during the past 60 days and have endeavored to clean up stocks which they carried over from the last two seasons. The cold weather has caused stoves everywhere to be forced to their full capacity, so that next fall will find many of them unfit for use, and the outlook for a good trade at that time is decidedly encouraging. Notwithstanding the dullness, manufacturers are not idle but are busy on their lines for this year's trade. Visits to the pattern shops of the local foundries find them working larger forces than for some time past. In fact one concern was compelled to advertise for additional pattern makers. This indicates that the local stove men will be in the market with goods that are "up to date" in every particular. Steel ranges will be pushed with much vigor during the coming season and three of the four St. Louis foundries will have exceptionally full and complete lines of ranges to offer to the trade.

The sale of furnaces has been satisfactory and the test to which they have been put by the extreme weather has been a severe one. The wood burning air tight heaters have sold in large quantities and it is estimated that between 15,000 and 16,000 were made in St. Louis during the past season.

The gasoline stove trade opens with excellent prospects. The local manufacturers have made extra improvements in their goods, which will, it is hoped, be followed by an increased sale during the coming summer months.

Amos C. Barstow.

The annual meeting of the Barstow Stove Company was held at the company's office in Providence, R. I., on Saturday, February 9, at which the secretary presented a paper to the stockholders of which the following is a copy:

At the regular meeting of the New England Stove Manufacturers' Association, held at Boston October 18, 1894, the following resolution was unanimously adopted:

Resolved, That this association, through proper resolutions, express its sense of loss in the death of Hon. Amos C. Barstow, and that a committee of three be appointed to draft such resolutions, to be forwarded to the family and business associates of the late Mr. Barstow, and that a copy of the same be entered on the records of the association.

George W. Walker, Albert N. Parlin and J. R. Prescott were appointed a committee, and herewith hand you a copy of the resolutions prepared and reported by them.

Whereas, Death has removed one of our valued associates since our last meeting;

Resolved, That in the death of the Hon. Amos C. Barstow we recognize a sense of loss in which the whole community where he was known must share. Although he was not actively connected with our association, he was known to us by a reputation which made him one of the most prominent men ever identified with our trade.

His abilities and virtues enabled him to command in an unusual degree the confidence of others, and the stove trade feels itself honored in the long list of public and private offices and positions of trust held by him.

We bear testimony to his honorable career as a merchant and to those graces of manner and character which endeared him to so many as a friend.

To his associates in business and to his family we extend our sympathy and place upon the records of the New England Stove Manufacturers' Association this tribute of respect and esteem.

GEO. W. WALKER,
A. N. PARLIN,
J. R. PRESCOTT,
} Committee.

Cupola Tuyeres.*—V.

BY DR. EDWARD KIRK.

Hight of Tuyeres.

There is a wide difference of opinion among foundrymen as to the hight or distance tuyeres should be placed in a cupola above the sand bottom. So great is this difference of opinion at the present time that tuyeres are placed in cupolas at from 2 inches to 5 feet above the sand bottom. This wide variation in the hight of tuyeres is due to some extent to the different classes of work done in different foundries, it being claimed by foundrymen making heavy work that it is necessary to have the tuyeres high to hold molten iron in the cupola and keep it hot for a large casting. Foundrymen making light castings requiring very hot iron draw the iron as fast as melted, and do not think it necessary to have high tuyeres to hold iron in the cupola. In the many experiments I have made in melting iron in a cupola I have placed the tuyeres at various distances above the sand bottom, and closely observed the effect of tuyeres at different hights. I learned by these experiments that the fuel under the tuyeres is not consumed in melting, nor is it wasted away to any extent by the heat or molten iron coming in contact with it. Charcoal may be placed in the bottom of a cupola, and if care is taken to prevent it being consumed by admission of air through the front before the blast is put on the charcoal will not be consumed during the heat and may be found in the dump. I have tried this in my experiments to soften hard iron by bringing the molten metal in contact with charcoal in the bottom of a cupola and found it correct. Pieces of charred wood used in lighting up are often found in the dump after having remained in the cupola through a heat. If these soft combustible substances are not consumed under the tuyeres, then it is not at all likely that the less combustible hard coal and coke are consumed. No iron can be melted in a cupola under the tuyeres, and the only function of the fuel below the tuyeres is to support the stock in a cupola above the tuyeres. If there is not sufficient heat in the bottom of a cupola to consume wood or charcoal, then there is not sufficient heat to keep molten iron hot for any length of time; and it is a well-known fact among practical foundrymen that large bodies of molten iron can be kept hot and fluid for a greater length of time in a ladle when covered with charcoal to exclude the air than it can be in a cupola.

Another reason given in favor of high tuyeres is that it is necessary to have them high to tap slag in long heats. The only slag in a cupola that can be drawn from it through a slag hole is a light fluid slag that floats on top of the molton iron or rests on the bottom of the cupola when there is no molten iron in it, and this slag may be drawn at any point between the sand bottom and tuyeres. When a slag hole is placed high, slag can only be drawn when the cupola is permitted to fill up with molten iron and raise the slag upon its surface to the slag hole. Slag may then be drawn for a few minutes while the cupola is filling up with iron to the slag hole. As soon as the iron reaches the slag hole, however, it flows out and must be tapped from the front. The slag then falls in the cupola with the surface of the iron as it is drawn off and the slag hole must be closed to prevent the escape of blast through it. Iron tapped after permitting a cupola to fill up to a high slag hole is always dull.

When a slag hole is placed low it is not necessary to have the cupola fill up with iron before slag can be tapped, for the slag may be drawn off the bottom of the cupola, and, furthermore, the slag hole may be opened and permitted to remain open through a heat without waste of blast. The flow of slag regulates itself when the hole is of a proper size. It is, therefore, not necessary to place tuyeres high that slag may be drawn from a cupola, nor is it necessary to hold iron in a cupola for a large casting or to keep it hot. Molten iron should be handled in a ladle and not in a cupola.

Hot iron for light work cannot be made in cupolas with high tuyeres, and for this reason the tuyeres in stove foundry cupolas are always placed low. In cupolas of large diameter, having a large bottom surface for molten iron, the tuyeres are placed so low that those at the back of the cupola are not more than 1 inch above the sand bottom, and those in front not more than 2 or 2½ inches above the sand bottom. Tuyeres placed in this way give ample space below them to hold molten iron for this kind of work, for the iron must be very hot and is drawn from the cupola as fast as melted, and the cupola is large enough to melt iron as fast as it can be handled, and it is only when the cupola is not working free that it is stopped up to accummulate iron. The tuyeres in any cupola may be placed as low as in these large ones, if provison is made for handling the iron as fast as melted.

In smaller cupolas not capable of melting iron sufficiently fast to fill a 40-pound hand ladle every 8 or 10 seconds the tuyeres are placed from 2 to 4 inches above the sand bottom, so that a sufficient quantity of iron may be collected before tapping to give each man in the section catching a hand ladle full and fill the ladle in about 6 seconds.

In cupolas of very small diameter the tuyeres should be placed from 6 to 10 inches above the sand bottom. These very small cupolas melt so slow that if the iron is drawn as fast as melted the stream is so small that the iron is chilled in flowing from the cupola to the ladle more than it is by holding it in the cupola until a body of iron is collected sufficient to supply a large stream.

In machine and jobbing foundry cupolas tuyeres are generally placed from 18 to 24 inches above the sand bottom. The object in placing the tuyeres so high is to hold iron in the cupola for a large casting. But, as before explained, this is not necessary or advisable. Another reason for these high tuyeres is that they are necessary for tapping slag. The slag from many cupolas is drawn off at the tap hole with the iron, and a number of spouts have been invented for separating the slag from the iron and preventing it running into the ladle. Slag may be drawn from the back of a cupola on a level with the sand bottom at that point, if the iron is drawn as fast as melted, or it may be drawn 1, 2 or more inches above the sand bottom at that point. It is, therefore, not necessary to place tuyeres at so great a hight to tap slag.

The tuyeres in cupolas for heavy work should be placed from 6 to 8 inches above the sand bottom when slag is not to be tapped. This gives an abundance of room in a cupola for holding iron while removing or placing a large ladle, and that is all that is necessary. The tuyeres in many of the cupolas used in Bessemer steel works are placed 5 feet above the bottom. They are probably placed at so great a hight because the tuyeres in the first cupola constructed for this work were placed at that hight. Tuyeres in all cupolas should be placed as low as they can be for the size of the cupola and facilities for handling the iron, for the fuel placed in a cupola under the tuyeres is not consumed in melting and is wasted by being heated in the cupola and crushed and burned in the dump. The value of fuel wasted every year in the United States by the use of high tuyeres in cupolas is sufficient to make a man rich.

* Copyrighted, 1894, by Edward Kirk.

ODD PLATES.

THE WORKS of the Ohio Stove Company of Portsmouth, Ohio, have begun operations again after a shut down of several weeks. The plant has been enlarged and improved and work is resumed with a full force.

THE WEST SIDE FOUNDRY COMPANY of Troy, N. Y., favor us with illustrated circulars of some of the specialties which they are offering the trade. Among these may be mentioned the Paris Ideal six-hole range with smokeless attachment; the Masterpiece, a square base burner which has recently been placed upon the market; the Improved Paris Imperial, a new surface burner, made in three sizes; the Paris double draft, a six hole range of attractive design; the Paris Marvel, a four hole range for hard coal or wood; the Paris Home Comfort, a six-hole range of the latest pattern, and the Paris cottage parlor and range combined. The company have in process of preparation a new stove catalogue which they expect to distribute to the trade in the course of a few days.

THE EVANSVILLE STOVE WORKS, Evansville, Ind., have recently enlarged their warehouse. They started up their works on the 13th ult., running with a full force.

RATHBONE, SARD & CO. of Albany, N. Y., are distributing to their friends an interesting puzzle, the solution of which will help to occupy many an hour in these dull times. The puzzle consists of a paper dumb bell about 5 inches in length, the ends carrying representations of acorns and the inscription "Acorn stoves and ranges." Between the ends and upon the bar portion are three rings so placed that at first glance the puzzle seems impossible of solution. The idea is to take off and replace the rings without bending the bar. Like everything else it is very easy when one knows how, but the "know how" is what is difficult to acquire.

NEW YORK STOVE MEN are reaping honors and Walter A. Clark of the Phillips & Clark Stove Company, formerly of Troy, N. Y., and now of Geneva, is getting a large share of them. Assemblyman Clark is now to be complimented upon his selection as treasurer of Hobart College.

EDMUND T. RAFTERY, manager of the Chicago branch of Rathbone, Sard & Co., Albany, N. Y., is making his annual visit to friends in the East.

THE HOBRECKER STOVE COMPANY of Omaha, Neb., have issued a very neat catalogue of gasoline stoves, ovens and furniture which they are offering the trade for the season of 1895. The stoves are placed on the market under-

the name of the Insurance line. They comprise all styles of individual and single generator stoves, high juniors, low juniors, &c. The catalogue is a highly original production, abounding in poetry, quaint sayings and curious letters from queer customers. It is undoubtedly of a character to attract attention.

A HUGE LINEN BACKED CARD reaches us from the Michigan Stove Company, on which is printed a capital appeal to the reader. It very appropriately begins, "This cloth is not all wool and a yard wide," and then refers to the merits of Garland stoves and ranges. The Michigan Stove Company display much originality in these advertising devices. Manager Gardner comprehends both the art of catching the attention of a reader and then saying something likely to fasten itself on his memory.

THE PORTSMOUTH STOVE & RANGE COMPANY, Portsmouth, Ohio, despite the discouraging past and the uncertain outlook, have been doing a very satisfactory business. The company have at present more orders on their books than ever in the history of their business.

THE JOSEPH BELL STOVE & RANGE COMPANY of Muncie, Ind., are being represented this year on the road by J S. Bush, who is traveling in West Virginia, Kentucky and southern Ohio; C. M. Silkey in Illinois and eastern Missouri; T. J. Schultz in Indiana and northern Ohio, and G. W. Hasty in western Missouri and eastern Kansas.

THE CRAIG-REYNOLDS FOUNDRY COMPANY of Dayton, Ohio, have issued a circular letter to the furnace trade, intimating that now is the time to consider the handling of the Triumph, which they manufacture in several varieties. The company also manufacture hot water, steam and combination heaters, but the Triumph warm air furnace is their specialty. Accompanying the letter are a number of lesflets carrying illustrations of the company's lines. Among these we notice the Triumph All Cast heater, the Triumph Air Blast, the Triumph King, the Triumph Special and the Triumph steel furnace. These are shown with the outer casing removed, so as to enable the dealer to obtain a better idea of the internal construction than would otherwise be the case.

BISSELL & Co. of Pittsburgh, Pa., are to supply the grates for the Woman's Building at the Cotton States and International Exposition to be held at Atlanta, Ga., from September 18 to December 31 of the present year. The company have agreed to furnish 13 of their Peerless and Columbian grates of various styles, finished in electroplated brass, bronze and silver.

THE WEST SIDE FOUNDRY COMPANY of Troy, N Y., are building up a very gratifying trade in their specialties, and we understand they are seriously contemplating an addition to the north end of their molding shop, extending it 100 feet to 27th street. This will make the addition about 100 x 80 feet in size and give 8000 square feet of space. The 1½-story building on Third avenue, in which is located the office, is to be raised to the hight of three stories, the upper two floors to be used for storage purposes. A bridge will be erected connecting this addition with the mounting shop. In addition to the manufacture of stoves and ranges, the company make a number of specialties for other concerns, and these orders are increasing to such an extent that all of their space is now occupied. William Sleicher, Jr., is general manager of the company; John A. Sleicher is secretary and treasurer; Edwin A. Keating, for many years with Rathbone, Sard & Co., is the general sales agent, and W. N. Sleicher superintendent.

WE ARE INDEBTED to the Joseph Bell Stove & Range Company of Muncie, Ind., for a photograph of the New Belmont Arlington line of soft coal and wood cook stoves and ranges for 1895. The cooks are made in 14 sizes and there are four sizes of a six hole range, both square and reservoir, also with new style tea shelves and high closets. The goods are attractively finished, having nickel plated front door and oven door panels, outside oven shelf, tea pot shelf, oven door handles and damper handles. The mounting is of a high order and the castings are of fine grade. A new style of wood cook under the name of La Belle Arlington has also been brought out, the ornamentation and general appearance of which are similar to the Belmont Arlington. Fourteen sizes are made as well as the usual modifications. The company state that their traveling salesmen, for the brief period they have been out this year, have forwarded sufficient orders for these goods to warrant the statement that they will prove very popular.

THE PORTSMOUTH STOVE & RANGE COMPANY of Portsmouth, Ohio, have succeeded, through the assistance of Hon. William F. Kemmler, United States Consul at Horgen, Switzerland, in establishing an agency for their steel ranges at Thalmeil, Switzerland. The Swiss agent will be H. Berthold, an extensive dealer in stoves, ranges, &c. Consul Kemmler, in a letter to a local German paper, says that stoves and ranges are very expensive in Switzerland and he is of the opinion that American manufacturers can, with a little energy, build up a very profitable trade.

WE HAVE RECEIVED, with the compliments of the Leibrandt & McDowell Stove Company, 22 South Charles street, Baltimore, Md., and 123 North Second street, Philadelphia, a pocket map of Virginia and West Virginia, and also one of Delaware and Maryland. These maps are folded to convenient size for the pocket, and are inclosed in heavy paper covers, upon the second page of which are calendars for the year 1895. Upon the outside covers attention is called to the celebrated Farmer Girl cook stove and the lines of heaters, ranges and furnaces manufactured by the company.

OSCAR I. LUCE, president of the O. I. Luce Stove Mfg. Company, at Leeds, Mo., died Sunday, January 27, at his home, 2935 Woodland avenue. He was 40 years old and leaves a wife and three children.

THE INDIANA STOVE WORKS of Evansville, Ind., are about to increase their facilities by the erection of a three-story brick warehouse, permits for which have recently been granted.

THE BLOOMINGTON STOVE COMPANY of Bloomington, Ill., were incorporated on January 30, with a capital stock of $50,000. The incorporators were John W. Evans, Edwin H. Miner and Howard E. Hays.

THE NEWSOME COMBINATION HEATER COMPANY have recently secured ground on the east side of the City of Detroit, Mich., and it is their intention to soon begin the erection of a large factory for the manufacture of a combination oil heater, cooker and lighter. The leading spirit in the formation of the company was Robert R. Grange of Chicago, and he has associated with him as active members of the concern William Wright of Scotland, Simeon Newsome, J. A. Lotz and J. W. Berns, all of Detroit. At present the office and headquarters of the company are at 112 Gratiot avenue, where there are on exhibition samples of the goods mentioned.

WE HAVE RECEIVED FROM W. E. Puffer of 136 Beekman street, New York City, a copy of the 24-page pamphlet which he has issued relating to automatic furnace regulators. The device is described at considerable length, and directions are given for using the regulator and furnaces. More than one-half of the pamphlet is given up to testimonial letters, nearly all of which we notice bear date of January of the present year.

THE CONOVER FIRE PLACE MFG. COMPANY have reorganized their business under the management of the members of the late firm of J. S. Conover & Co. and are located at 7 and 9 West Thirtieth street, New York City. The warerooms of the company have been fitted up in attractive style and contain a fine display of wooden mantels, fire places and their furnishings in great variety of designs. The company make a specialty of architectural metal work, ornamental bronze for banks and offices, wrought iron grill work, floor and wall tiling, &c.

THE PALERMO MICA COMPANY, 27 Peck slip, New York, miners, importers and wholesale dealers, issue in very pretty form their 1895 standard price-list of selected mica, the list having taken effect January 1. The second page of the circular gives the standard price-list, the third page gives the prices of 1, 2 and 3 pound assorted packages, put up expressly for the retail trade, while the third page gives the retail price list of mica by the sheet. The printing is done on a fine grade of paper with red ink, and is a neat piece of work.

THE ROUND OAK STOVE WORKS of Dowagiac, Mich., are reported to have closed their works on the night of Friday, February 8, throwing out of employment between 300 and 400 men. We understand that the employees asked that the 1894 scale of wages be restored, and that a refusal of the demand on the part of the company resulted in the men going out and the closing of the works.

PRESIDENT CHARLES O. LYON of the Thatcher Furnace Company, 240 Water street, New York, is making a two weeks' trip through the West. He reports excellent results from the Thatcher hot air furnace and the Champion steam and hot water heater during the recent severe weather.

THE TOLEDO STOVE COMPANY of Toledo, Ohio, report the prospects for 1895 as very bright. They expect to produce a much larger tonnage than ever during the year, and with this object in view started their plant with a full force immediately after the holidays. Unfortunately, however, a fire occurred on January 22, which com-

pelled them to shut down for a time. As soon as the weather permits and the work of rebuilding has been completed, they will at once resume in all departments.

The Standard Lighting Company of Cleveland, Ohio, have just issued from the press an exceedingly attractive catalogue of New Process gas ranges for the season of 1895. The volume is printed in colors upon a good quality of paper, and bound in neat covers with embossed side title in gold. The illustrations of the stoves appear in a deep shade of green, while the text is printed in red. The opening pages call attention to the many novel features embodied in the New Process goods, and refer among other things to the high grade of workmanship, "careful selection of materials and testing, handsome appointments, graceful design and ingenious, effective simplicity." The New Process range is shown in numerous varieties of cabinet style, and in connection with each illustration are given the sizes in which the stove is made, the number of burners, size of bake, roast and warming ovens, chop broiler, stove top, size of step, weight, price, &c. Brief reference is made to hot plates, the Radiant gas heater, ovens, burners, valves, &c. The last page is devoted to a table of comparisons, showing the difference in the cost of cooking by coal and gas.

H. Waterman of 111 Beekman street, New York City, visited the trade on the line of the New York Central and Erie railroads during the past week. Mr. Waterman represents the Cleveland Foundry Company of Cleve land, Ohio, and secured some very gratifying orders.

George J. Ralph, for 20 years idenfied with the stove trade of Buffalo, succeeds H. E. Stambach as the Buffalo agent for the Garland stoves and ranges.

The Carton Furnace Company of Utica, N. Y., were delayed a couple of days in starting their cupola by reason of the severe storm which swept over the country the past week. They had their temporary building all up with the exception of the roof when the storm prevented further progress. They have contracted for their new foundry building, the iron work now being on the way. The contractors agree to give the company possession of the new building the first week in March, providing the elements permit. The company on Wednesday, February 13, lighted their cupola for the first time since the fire, thus making a loss in time of only eight days.

Sam S. Utter of 113 Beekman street, New York City, has been doing an export business during the past week. We understand that on Monday he made a shipment of goods to Honolulu, on Tuesday to Havana and on Wednesday to Rio Janeiro.

The Bridge & Beach Mfg. Company, St. Louis, Mo., who have been at work for some time past on a line of steel ranges, advise us that they will be ready to offer these goods to the trade about March 1. Circulars, catalogues, &c, are being prepared and will shortly be issued. These ranges will be substantially built and will, we understand, be moderate in price.

The Wolff Gas Radiator Mfg. Company, 164 Franklin street, New York, report a good trade in the Wolff gas radiator during the recent cold weather.

Illness of Secretary Thomas.

We are very sorry that we cannot give a more encouraging report of the condition of Secretary Thomas of the National Association of Stove Manufacturers. Last week he showed a slight improvement, and hope was expressed that it might prove a permanent change for the better. Since then, however, Mr. Thomas has been somewhat worse, and the report furnished us on Thursday of this week was that he had been failing during the preceding three days. All will hope that in our next issue we may give brighter news, but we fear there is little ground for this hope.

Hints in Regard to Window Display.

BY J. P. HUMES.

The show window might be termed a silent salesman, and if given the proper amount of attention will accomplish its object, namely, to attract the passers by and induce them to make purchases, or make an impression upon the looker on which will lead to purchases in the future. It serves as a reminder to forgetful people—to the busy man whose better half asked him to bring home a carpet sweeper or tack hammer, but it escapes his mind, until seeing the required article in a window his memory is refreshed and thus a sale is made.

Cleanliness.

To fulfil its object the window must be kept clean and neat both inside and outside, and the arrangement of the goods should be such that they will be pleasing to the eye. There is, I might say, hardly any limit to the kinds of goods suitable for display, for one must consider the fact that all classes and kinds of people pass stores.

The Kind of Goods.

I find it a paying plan to display a few wares that will appeal to the masses, and under that head I might mention goods such as Mouse Traps, Pocket Knives, Scissors, &c.; in other words, goods which some one wants all the time. Do not confine the display to any one class of goods, but have a variety of articles, among which every one will see something which will interest him.

Constant Changes.

Displays should be changed at least once a week, for while there are numbers of people who seldom pass the store there are hundreds of others who pass daily. If the display is not changed at least weekly it will not catch their attention, while if frequent changes are made in the display it will be able to attract all.

A Little Beforehand.

Seasonable goods should always be given a prominent place in the window, and it is a wise plan to display wares a fortnight before the season for their use opens. By so doing the lookers on are apprised that a certain article is handled, and when they require the same they will recall having seen the article in the window. The probabilities are that they will then purchase. Hardware stores, as a rule, seldom have sufficient space in their windows to display articles in actual operation, and as such a display adds greatly to the expense I do not think such displays are profitable.

The Arrangement.

In making a display the goods should be so arranged that they will not only appear artistic in every way, but also so that the articles will appear to their best advantage. Avoid crowding a great number of goods in the window at the same time; do not try to show a sample of everything you keep at the same time.

Plain Figures.

To reap the full benefits of a display it is necessary to card each article shown, not only marking its price in plain figures, but also have some remarks on the price card in reference to the goods. The cards should be written so that he who runs may read, and so worded that they will to a certain extent interest the reader. Quotations from well-known authors, which apply to artices displayed, will interest the people. To explain more fully, I give, as follows, a few examples of cards:

BUTCHER KNIFE.

A better Knife did never itself sustain upon a butcher's stye.

50 cents each.

SAW.

Of all the Saws you ever saw, you never saw a Saw saw as this Saw saws.

Only $1 each.

SERRATED EDGE KNIVES.

Hot bread cut as easily as cold.

$1 a set.

MOUSE TRAPS.

The cat is minus a job since the Delusion was invented.

15 cents each.

BARLOW KNIVES.

Ragedy, O! Wherever I go, I am always known as Billy Barlow.

Warranted genuine imported Barlow's, only 25 cents each.

A window may be dressed in an economical way as follows: Have the floor of window built on an incline; cover the floor with colored material; make a border of two rows of brass jack chain; have the sides or walls painted white, on which can be placed a circle of Masons' Trowels, Hatchets, Saws, Dog Collars, Chains, or, in fact, any article which will show to advantage when tacked to the wall. Stretch from one end of the window to the other, about 3 feet from the floor, a brass wire upon which to hang suitable goods. Then make the main display on the floor. If the articles displayed are small, such as Picture Nails, Molding Hooks, &c., a dozen or so should be arranged in a semicircle or triangle. If the articles are large, one is sufficient. The clerk having the dressing of a window in charge should have an adaptability for the work, as it requires extreme good taste.

To Prevent Rust.

If the window is damp and it is found that bright goods rust when displayed, purchase some mercurial ointment and rub the article with it, and it will be found that the goods can be exposed to any amount of dampness and still retain their polish.

Definite arrangements are reported to have been made for the organization of a corporation to develop Southern industries and interests by the establishment of a permanent Southern exchange in New York City. The new corporation will, it is said, be a stock company, capitalized at about $200,000. An Executive Board of from 15 to 30 members, representing the different regions and interests of the South, will superintend its operations and direct its policy.

TRADE REPORT.

The Iron Market.

Reports are somewhat contradictory and reflect the contending influences which are shaping the situation. The business community is nervous over the financial muddle and is gradually working itself up to a high pitch of irritation, coupled with a pronounced contempt for the vast majority of politicians. No sound business revival need be hoped for until this country is known to be unquestionably committed to a square gold basis. Domestic or foreign capital will not go into new enterprises on a liberal scale until then, and without that stimulus our industries must drag along with insufficient work.

Outside of a fair run of sales of Lake Ore from the accumulations on the docks nothing has been done. Therefore the much talked of advance in prices has not yet been seriously tested. Some uneasiness has been created by numerous reports of a recurrence of labor troubles in the Coke trade. Some of the large interests have again accumulated big stocks of the fuel.

One bright spot is the condition of the Wire industry, which has been booking a very large tonnage. This is reflected in good sales of Wire Rods, with further large negotiations pending. It has also had its influence on Soft Steel Billets.

In the Foundry Pig Iron market, our Cincinnati correspondent notes that some large transactions are held in abeyance on account of the financial situation. In the Chicago district the local furnaces are well booked up, so that the Southern producers have had a chance to get some fair orders.

The Cast Iron Pipe trade records another record breaker in the way of prices, an Eastern foundry having carried off a 2300 ton order for Worcester, Mass., at the phenomenal price of $18 delivered.

Pig Iron.—The market in New York is rather a shade weaker, some efforts being made to push sales by Northern makers. Among the recent purchases are those of one consumer who has taken about 4000 tons to cover requirements up to August. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

In the Philadelphia Pig Iron market business has been very quiet during the past week, but there is no particular change in the general situation. The supply is fully equal to the demand, but at the prices now ruling further decline is almost impossible, so that consumers have no inducement to delay their purchases. On the other hand, there are so many sellers, and so many varieties of Iron, that buyers show no anxiety in regard to supplies, and are as unwilling as ever to make long contracts. Sales have been in moderate quantities at about the following prices for Philadelphia, and from 20¢ to 30¢ less for water delivery, or at points such as York, Harrisburg, &c:

Standard No. 1 Foundry X	$12.00 to $12.50
Standard No. 2 Foundry X	11.00 to 11.50
No. 2 Plain	10.75 to 11.00
No. 1 Soft	11.50 to 11.75
No. 2 Soft	10.75 to 11.00

Local furnace companies in the Chicago district report a fair run of orders for carloads, but no special movement beyond this. Shipments are increasing, the tendency still being to call for a greater quantity of Iron under contract. Agents of Southern furnace companies have entered orders aggregating 3000 tons. Lake Superior Charcoal continues very quiet. Quotations are as follows, for cash:

Lake Superior Charcoal	$13.00 to $14.00
Local Coke Foundry, No. 1	10.25 to 10.50
Local Coke Foundry, No. 2	9.75 to 10.00
Local Coke Foundry, No. 3	9.50 to 9.75
Local Scotch	10.50 to 11.00
Ohio Strong Softeners, No. 1	12.50 to 13.00
Southern Silvery, No. 1	11.50 to 11.75
Southern Silvery, No. 2	11.25 to 11.50
Southern Coke, No. 2	10.00 to 10.50
Southern Coke, No. 3	9.75 to 10.25
Southern, No. 1, Soft	10.25 to 10.50
Southern, No. 2, Soft	9.75 to 10.25
Alabama Car Wheel	17.50 to 18.00
Jackson County Silvery	15.50 to 16.00
Other Ohio Silvery	14.25 to 14.50

During the past week there has been more disposition on the part of furnaces in the Pittsburgh district to push sales, and a number of transactions involving 1000 and 2000 ton lots have been closed. Foundry Iron does not show any improvement, either in demand or price, the latter being much lower at this time than ever before. Quotations are as follows:

No. 1 Foundry	$10.50 to $10.65 cash
No. 2 Foundry	9.65 to 9.75 "

There has been quite a fair run of small orders placed during the week in the Cincinnati market, ranging from single cars to 100 ton lots and several sales of 500 tons, one lot of 1500 tons Mill Iron; but the large orders seeking placement have been suspended. While the outlook is improving there is too much uncertainty to allow any essential strengthening of the market and prices of all kinds are without change of importance. The unprecedented cold weather, too, has had a depressing effect. Shipments are retarded or suspended and mails delayed. Mills and foundries are gradually resuming, but even this impetus has received a check recently. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.00 to 9.25
Southern Coke, No. 3	8.50 to 8.75
Ohio Soft Stone Coal, No. 1	14.50 to 15.00
Ohio Soft Stone Coal, No. 2	14.00 to 14.50
Lake Superior Coke, No. 1	11.75 to 12.25
Lake Superior Coke, No. 2	10.75 to 11.50
Hanging Rock Charcoal, No. 1	16.00 to 16.50
Hanging Rock Charcoal, No. 2	15.50 to 16.00
Tennessee Charcoal, No. 1	13.00 to 13.50
Tennessee Charcoal, No. 2	12.00 to 12.50

Advises from St. Louis report that the demand for Pig Iron shows a slight increase without, however, any improvement in prices. Southern furnaces are not disposed to urge sales at prices ruling, as it is evident that the future appears more encouraging than it has for some time past. The local consumption has been increased by the starting up of two Stove foundries which have been closed down for the past two months. Sales during the week, while not large individually, aggregate a fairly satisfactory volume. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.00 to $10.25
Southern Coke, No. 2 Foundry	9.50 to 9.75
Southern Coke, No. 3 Foundry	9.00 to 9.25
Southern Car Wheel	16.00 to 16.50

Metal Market.

Pig Tin.—The market has been remarkably steady through the greater part of the week. Arrivals, although quite heavy, have been well taken care of and so handled that spot stock has been kept at a considerable premium over regular February contract price. The premium averaged about 0.40¢, but was greater at intervals. More or less covering of short sales was prompted by tardiness of delivery notices and consequent apprehension that deliveries might be deferred long enough to cause inconvenience in speculative quarters if contracts were left open. This and other buying, along with the fact that the bulk of stock on spot and afloat for this point is well controlled by a few firms, has kept prices somewhat independent of London fluctuations. Distant future deliveries, while not traded in except to a limited extent, have ruled somewhat higher. The movement of tin into the channels of consumption continues liberal, or at the rate of not less than 400 tons per week. Later in the week the market assumed a tamer appearance, consumptive orders being lighter, and only a moderate jobbing business passing. Straits Pig in small lots from store rules at 14½¢ @ 15¢ ℔ lb.

Copper.—Irregularity in prices has continued, and the market has shown rather weak tone, the result chiefly of disappointing business on both home and export account, that has led to freer offering from outside sources or the small producers. Retail business has been very moderate, consumers showing little interest except in small lots for present use. Lake Ingot from store in small parcels is quoted at 10½¢ ℔ lb.

Sheet Copper.—The demand for Cornice Copper is very tame in this section and little of note is being done in the way of contracts for forward deliveries. Inquiry is, however, reported as fairly active, indicating the prospect of good business later on when the weather and general business conditions are more settled. The price asked for small lots of Sheet Copper from store is on the basis of 15¢ ℔ lb net.

Pig Lead.—The recent blockade on the railroads, owing to the severe storms, has operated to strengthen temporarily the price for American Pig in the East. Stock from stores conveniently located for immediate delivery to consumers' works has realized a slight advance, 3½¢ @ 3⅝¢ being quoted for moderate sized parcels. Otherwise the market has been bare of distinctly new feature. The demand

has continued moderate and the offering reserved, as for some time past.

Lead Pipe and Sheet — Nothing tangible in the way of improvement can be roported in the demand for Lead Pipe or Sheet Lead. Buying is still of the hand to mouth character, which has marked it for some time past, slightly increased, perhaps, in the past week by the requirements incident to repairs to plumbing work during the frost. Prices in this section are maintained at the list rate, namely, 5½¢ for Pipe, and 6¼¢ for Sheet, with 20 %.

Spelter.—There has been no improvement. In fact, the market has remained quite weak and positively dull, the extremely low prices being ineffective as an inducement to buyers. Western brands in small lots are quoted by jobbers at 4¢ @ 4½¢ ℔ lb.

Antimony.—Demand has been only fair and the market is rather weak under the influence of freer offering. Present prices for small parcels are about 8¢ for Hallett's and 9¼¢ @ 9½¢ for Cookson's, from store.

Nickel.—Sellers' prices are 35¢ @ 40¢, according to size of order.

Tin Plates.—The market in general during the past week has shown as checrless an aspect as it has exhibited at any time since the beginning of the year. Interest in forward deliveries of imported Plates has been entirely commonplace, and the business effected in this line by importing and jobbing houses did not at all equal the average of the preceding two weeks, although quite as attractive inducements in the way of low prices were made. There have been rumors, however, of contracts in this line having been placed with some American works. For the greater part of the week spot business has also been remarkably flat, although in the last few days, since the moderating of the weather, some improvement is noted in this respect, but orders have been almost invariably for small lots, and the entire business has made a poor showing. The domestic works generally are reported as starting again into operation, while advices from the other side are to the effect that more than half the Welsh mills are idle and the rest are only running fitfully. The market, as a whole, is in a most unsatisfactory condition, and prices are weaker than ever.

A special London cable dispatch of February 13 to *The Iron Age* reports on the British Tin Plate market as follows: The Tin Plate market is unchanged. Quotations are nominal in a great measure. There is more inquiry from Russia and San Francisco for future deliveries. Improved demand is noted for Black Sheets for America at £7. About one-half the Welsh works are now standing idle. Stocks at shipping point about 234,000 boxes. Quotations, f.o.b. Wales, are given as follows:

Bessemer Cokes, IC 14 x 20	9/	@ 9/1½
Siemens Cokes, IC 14 x 20	....	@ 9/4½
Ternes, 20 x 28	18/	@ 23/
Charcoals, IC 14 x 20	10/6	@ 13/

Sheet Iron.—Considerable inquiry is noted for future supplies of both Black and Galvanized Sheets. Consumers seem to be becoming impressed with the idea that prices have reached their lowest level, and the opinion is widely held that the present is a favorable time for closing contracts for future wants. Manufacturers, on the other hand, are not eager to book far ahead at the current rates. Some good sized orders are being placed for Black Plates for tinning purposes, and the productive capacity for these Plates is increasing rapidly with the starting into operation of old and new mills under the recent wage compromise. Jobbers' quotations for small lots of No. 27 Common Iron from store are about 2.65¢. Galvanized Sheets in small lots rule at 75 and 5% @ 75 and 10% off

Chicago Report.

Scrap.—The demand is light. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c.	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	...	2¼¢
Rubber		4 ¢

Anthracite.—The prolonged cold weather is at last affecting trade. Business is much better. The Soft Coal war is ended, the railroad companies having advanced their rates to old schedules. Carload lots of 12 net tons or over are quoted as follows, although some concessions are now being made:

	Egg, Sto. Grate.	and Ch.
Chicago, Ill	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8 10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7 95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

TATHAM & BROS, 82 Beekman street, New York, manufacturers of Drop and Buck Shot, Bar and Sheet Lead, &c., have temporarily lost the use of the upper part of their shot tower, through damage by fire, which broke out in one of the upper stories Thursday afternoon, February 7. The tower, which has long been a landmark in that portion of the city, was constructed about 1858, and is 225 feet high, being built of iron columns filled in with brick. Portions of the tower will be in use in a few days and the balance shortly. There was no insurance.

THE EVERSON TUBE & METAL COMPANY are a new concern in Pittsburgh, Pa. The incorporators are: George H. Everson, M. H. Howell, Joseph A. Shinn, R. W. Richardson and John Owen.

CONDITION OF THE

Hardware Trade.

THE PAST WEEK has witnessed few changes in the market. Prices continue as for some time past without any general strengthening, but with a slightly better tone on a few lines. Some kinds of Hardware which have been low and demoralized are in no better shape, but on most lines prices are pretty well maintained on the low levels with which the trade are familiar. The improved condition in Wire Nails, Barb Wire and to some extent in Plain Wire are encouraging features, and on some of these goods the trade are recognizing the fact that it is the part of wisdom to have their requirements for the spring trade covered by orders and early shipments. There is a fair volume of business, but the extremely cold and severe weather which has prevailed so generally throughout the country has curtailed transactions considerably. Stocks are very low in the hands of jobbers as well as retailers, and the policy of keeping them so is still followed. The feeling is freely expressed by well informed business men that if the financial question was settled and monetary matters put in good and permanent shape there would be an early and marked improvement in trade.

Advices from Chicago.—Shelf Hardware jobbers have experienced a quiet week. The mails have been seriously interrupted by the terrific weather which so generally prevailed throughout the country and traveling men have been storm bound in every direction. Heavy Hardware jobbers report the receipt of good specifications from large buyers of Iron and Steel. Contracts which had been entered for March shipment are now being filled, as consumers are in need of the material earlier than was expected. Prospects are extremely good for larger business.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in excellent condition and with substantially the same prices as were mentioned in last week's review. The tone of the market is firm, especially in view of the fact that manufacturers are well supplied with orders and inquiries are coming in in good volume. The opinion is expressed by those who are well informed that in view of the diminished production, as compared with last year, the mills, with only an average demand, will be fully occupied for several months to come.

Advices from Chicago.—Manufacturers are extremely busy, the largest concerns being furthest behind in shipments. Orders are good and the trade appears to be in excellent shape for another advance, which is daily expected. Local jobbers, however, are uninfluenced by the manufacturers' report of better business, and continue to cut prices as freely as ever, although manufacturers assert that a loss is netted on every keg sold at the low rates now prevailing. Small lots from stock here are selling at various prices, ranging from 95 cents to $1.05, according to the disposition of the seller. It looks now as if every retail merchant who wishes to buy Wire Nails cheaply should place his orders as quickly as possible, as prices may be advanced at any day.

Cut Nails.—There is little change in the Cut Nail market, but the condition is perhaps somewhat improved, as manufacturers are refraining from pushing for business with as much energy as they sometimes do. There is also a diminished output on the part of the mills, and this tends to give a slightly firmer tone to the market. Small lots from store, New York, are held at about 90 cents. Business is rather quiet.

Advices from Chicago.—Trade continues about the same as previously reported. Manufacturers are receiving orders, but not large ones. Small lots from stock are selling at $1.

Barb Wire.—The Barb Wire market is characterized by a good degree of activity and an excellent tone. Small lots from store in New York are held at $2.15 to $2.20.

Advices from Chicago.—Factories in this locality are well fixed with orders for the present and report prospects bright for a considerably heavier movement in March. Good inquiries are being received for large quantities. The improved demand for Wire Rods in this vicinity reflects the activity now prevailing in the Wire Nail and Barb Wire trade. Prices are unchanged. Small lots from stock are selling at $1.65 for Painted and $2 for Galvanized.

Freezers.—We are advised by the White Mountain Freezer Company Nashua, N. H., that they have abolished the system of list and discount in connection with the sale of their White Mountain, Granite State and Arctic Freezers, which they are now quoting at net prices. They refer to this change as simplifying the method of quoting and selling the goods.

Wringers.—The American Wringer Company, 99 Chambers street, New York, in issuing their price-list of Wringers under date of January 1, 1895, have rearranged it and made a few slight changes as compared with their circular of July 1, 1894. The second and third pages contain their standard high grade Wringers with iron and wood frames and for folding benches. The last page describes what are termed regular grade Wringers, with both iron and wood frames and for folding benches, at somewhat more moderate prices. They have also added the Star, iron frame, and Falcon and Crescent, wood frame, Wringers to those heretofore made.

Wrought Iron Pipe.—The lists recently adopted by the Pipe manufacturers and printed in full in our last issue have met with the general approval of the trade. It has for some time been recognized as desirable that the inequalities in the old lists should be corrected, inasmuch as if in an assorted order standard sizes were sold at cost under the old lists and discounts less salable sizes would be sold below cost. This condition of things has been recognized by the manufacturers for some time, and the new list represents an attempt on their part to make one based throughout on the cost of manufacturing the goods. This rather than to make an advance in the price of the goods was the object of the action taken by the meeting.

Glass.—The rigorous weather which has been so general throughout the country has contributed to the dullness which pervades the Glass trade, and with the usual quiet of the season has resulted in almost nothing being done for the past week. From indications building for the coming nine months will be on a much larger scale than for either of the two previous years; and if this proves to be the case the outlook is favorable for a larger demand for Glass. Reports from Pittsburgh indicate that the factory price for Glass in large lots is from 89 and 2 to 90 and 2 per cent. discount, though in some cases a price as low as 89 and 5 to 90 and 5 per cent. discount has been made. The New York market is represented by the following quotations: From store in small lots, 85 and 15 per cent. for Single, and 85 and 20 per cent. discount for Double Strength Glass. In car lots 88 per cent. for Single and 89 per cent. discount for Double Strength Glass.

Old Metals.—The demand for Old Metals is merely moderate, and prices exhibit no radical change. The following quotations represent the ruling rates paid by dealers, New York delivery:

Heavy Copper	℔ 7 ¢
Light and Tinned Copper	℔ 6½¢
Heavy Brass	℔ 4¾¢
Light Brass	℔ 3¾¢
Lead	℔ 2¾¢
Tea Lead	℔ 2½¢
Zinc	℔ 2⅛¢
No. 1 Pewter	℔ 10 ¢
No. 2 Pewter	℔ 5½¢
Wrought Scrap Iron,	℔ gross ton $7.50 @ $8.00
Heavy Cast Scrap	℔ gross ton 7.50 @ 8.50
Stove Plate Scrap	℔ gross ton 5.00
Burnt Iron	℔ gross ton 3.00

Old Rags, Paper, &c.—There is a rather better demand for Paper Stock, but dealers' purchasing prices remain substantially the same as those quoted last week, namely:

No. 1 White Rags	℔ ℔ 3 @ 3¼¢
No. 2 White Rags	℔ ℔ 2¼ @ 2½¢
Mixed Rags	℔ ℔ ¾ @ 1 ¢
Blues and 3ds	℔ ℔ 1⅛ @ 1⅜¢
Hard Sized White Shavings	℔ ℔ 2⅛ @ 2¼¢
No. 1 White Book Shavings	℔ ℔ 1¾ @ 2⅛¢
No. 2 White Book Shavings	℔ ℔ 1 @ 1⅛¢
Light Book Shavings	℔ ℔ ⅝¢
No. 1 Mixed Shavings	℔ ℔ ⅞ @ 1 ¢
No. 2 Mixed Shavings	℔ ℔ ⅝ @ ¾¢
No. 1 Printed Books	℔ ℔ 1 @ 1¼¢
Ordinary Mixed Books	℔ ℔ ½ @ ¾¢
Newspapers	℔ ℔ 2·5¢
No. 1 Manila Paper	℔ ℔ ¾ @ 1 ¢
No 2 Manila Paper	℔ ℔ ⅝ @ ¾¢
Bogus Paper	℔ ℔ ½¢
Common Paper	℔ ℔ ¼ @ 3·5¢
Straw Chips	℔ ℔ ⅜¢
Binders' Clippings	℔ ℔ ½¢
Jute Butts	℔ ℔ 1½ @ 1¾¢
No. 1 Jute Bagging	℔ ℔ 1 @ 1¼¢
Mixed Bagging	℔ ℔ ¾ @ 1 ¢
No. 2 Bagging	℔ ℔ ½ @ ¾¢
Hemp Twine	℔ ℔ 2 @ 2¼¢
Manila Rope	℔ ℔ 2 @ 2⅛¢
Jute Rope	℔ ℔ 1½ @ 1¾¢
Mixed Rope	℔ ℔ ¾ @ ⅞¢

Dr. Senner, Immigration Commissioner at Ellis Island, N. Y., in a report sent in to the Treasury Department, shows that during the year 1894 the total number of passengers sailing from New York, Boston, Phladelphia, Baltimore, New Orleans and Montreal was 311,760, against a total of 268,037 sailing from the same ports in 1893. During last year the number of immigrants arriving at Ellis Island was 167,585, who had in their possession $3,050,946 in gold. Steerage traffic from the United States to Mediterranean ports fell off considerably as compared with 1893, while steerage trsffic to Englsnd and Central and Northern Europe showed a large increase over the previous year. The hard times of 1893, when work was difficult to obtain, csused large numbers of Italians to return to their native country, while it had a contrary effect on people from Northern and Central Europe in keeping them in the United States. The total number of steerage passengers sailing from the United States in 1894 was 210,251, against 174,766 in 1893.

CONTENTS.

Editorials:	PAGE.
A New Illuminant	29
How Acetylene is Made	29
Application of Acetylene	29
The Weather and Plumbers	29
The German Stove Trade	29
The Letter Box—	
Electric Bell Trouble	30
Cold Air Duct	30
Will It Work? Illustrated	30
Method of Heating Water	30
Utilizing Arteslan Well Pressure	30
A Plea for Temperance	31
An Appreciative Reader	31
Arc Gravel Roofs Durable?	31
Heating Water by Electricity	31
Making an Oil Tank	31
Purifying Cistern Water	31
Can Top Wanted	31
Cleaning Zinc	31
Enameling Gasoline Stoves	31
Insurance Rates on Gasoline Stoves	31
Anti-Freezing Mortar	31
Plumbing and Gas Fitting—	
Example of Faulty Plumbing. Illus.	32
Kelley Extension Slip Joint Connection. Illustrated	32
Sanitation	32
The Humboldt Lavatory Basin. Illus.	33
New York Master Plumbers	33
A Copper Bathtub. Illustrated	34
Improperly Arranged Plumbing. Illus.	34
Traps and Vents	34
Massachusetts Master Plumbers	35
Steam and Hot Water—	
Mechanical vs. Natural Ventilation	36
The St. Louis Three-Column Radiator. Illustrated	36
Ventilating Schools	36
Determining Heating Power of Heating Systems	37
Heating Notes	37
Southern Freight Rates	37
Heating and Plumbing—New Work and Contracts	38
Roofing and Cornice—	
Looney's Zinc Shingles. Illustrated	39
Slate Items	39
Flashings	39
Sanitary Security Company	40
The Retail Store—	
Empire Spraying Pumps. Illustrated	41
Rochester Mammoth Fount. Illus.	41
Browne's Water Still. Illustrated.	42
The T. I. C. Mop Wringer. Illustrated.	42
The Myers Improved Drop Valve. Ill.	42
New Enameled Ware	42
A Unique Window Display. Illus.	43
Memoranda	43
Tin Plates—	
Distribution of Tin Plate Imports	44
Tin Plate in Wales and the United States	44
The Tin Plate Crisis in Wales	45
Scrap	45
Prevention of Smoke in Cities	46
Trade Notes	46
Stove Trade Notes—	
The Chicago Stove Trade	47
The St. Louis Stove Trade	47
Amos C. Barstow	47
Cupola Tuyeres.—V	48
Odd Plates	48
Illness of Secretary Thomas	50
Hints in Regard to Window Display	50
Trade Report—	
The Iron Market	51
Metal Market	51
Chicago Report	52
Condition of the Hardware Trade	52
Notes on Prices	52
Metal and Miscellaneous Prices	54
Labor Exchange—	
Help Wanted	56
Situations Wanted	56

Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 14, 1895.

Tin—

Straits pigs.....16½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX, 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX, 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 25.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade,	IC, 10 x 14	@ 5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX, 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX, 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—	IC, 10x14, 14x20	$4.75 @ 5.00
	IC, 14x20, 90 lb	4.25 @ 4.50
	IC, 14x20, 100 lb	4.50 @ 4.75
	10 x 20	@ 7.25
	20 x 28	@10.00
	IX, 10x14, 14x20	@ 6.25
B.V. Grade.	IC, 10x14, 14x20	@ ....

Charcoal Plates.—Terne

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

	IC, 14 x 20	@$5.00
	20 x 28	$9.50 @10.00
	IX, 20 x 28	12.00 @12.50

Worcester Brand and equal.—

	IC, 14 x 20	@ 5.25
	IC, 20 x 28	10.00 @10.50
	IX, 14 x 20	6.25 @ 6.50
	20 x 28	12.50 @13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
	Per box of 56 sheets	
X, 14 x 56		$12.50
XX, 14 x 56	26.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.37½
IX, 10 x 14, 12 x 12, 14 x 20 6.62½

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.62½
IX, 10 x 14, 12 x 12, 14 x 20. 7.12½

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.12½
IX, 10 x 14, 12 x 12. 14 x 20.. 7.62½

Usual extra or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20 ..... $5.75
IX, full weight, 14 x 20 ..... 7.50

Irondale A A:

IC, full weight, 14 x 20 ..... 5.25
IX, full weight, 14 x 20 ..... 6.75

Irondale A:

IC, full weight, 14 x 20 ..... 5.00

Irondale B:

IC, 100 lbs., 14 x 20 ..... 4.75
IC, full weight, 14 x 20 ..... 4.85

Irondale C, IC, 14 x 20, 100 lbs 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates.—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $5.00
Old Hundred, IC, 14 x 20, 100 lbs..... 4.75
R. W. & B., IC, 20 x 28, 216 lbs..... 10 00
Old Hundred, IC, 20 x 28, 200 lbs..... 9.50

Roofing Plates.

Palm, IC, 20 x 28 ..... @$10.00
Palm, IX, 20 x 28 ..... @ 12.00
Empire, IC, 20 x 28 ..... @ 10.75
Empire, IX, 20 x 28 ..... @ ....
Hickory, IC, 20 x 28 ..... @ 11.50
" IX, 20 x 28 ..... @ 14.00
Alaska (heavily coated), IC, 20x28 @ 13.50
Alaska IX, 20 x 28 ..... @ 16.50
Special, IC, 20 x 28 ..... @ 13.50
" IX, 20 x 28 ..... @ 16.50
Niagara, IC, 20 x 28 ..... 9.50
Iroquois, IC, 20 x 28 ..... 9.00

Westmoreland:

IC, 14 x 20 ..... 5.25
IC, 20 x 28 ..... 10.50

Kenwood:

IC, 20 x 28 ..... 10.00

Furmston:

IC, 14 x 20 ..... 4.75
IC, 20 x 28 ..... 9.50

Irondale AA, IC, 14 x 20 ....
Irondale A, IC, 20 x 28 ..... 10.50
Irondale B, IC, 20 x 28 ..... 10.10
Each extra cross $1.50.

Challenge, IC, 20 x 28 ..... 10.50

Juno:

IC, 14 x 20 ....
IC, 20 x 28 ....

Illinois, Old Method:

IC, 20 x 28 ..... 13.50
IX, 20 x 28 ..... 16.50

E. L.:

IC, 20 x 28 ..... 10.75
IX, 20 x 28 ..... 13.25

Jessie:

IC, 20 x 28 ..... 10.25

Old Process:

IC, 14 x 20 ..... 8.00
IX, 14 x 20 ..... 9.50
IC, 20 x 28 ..... 16.00
IX, 20 x 28 ..... 19.00

H. B. L., Old Style:

IC, 14 x 20 ..... 7.00
IX, 14 x 20 ..... 8.25
IC, 20 x 28 ..... 14.00
IX, 20 x 28 ..... 16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.65

Sheet Iron—

Black.

	Common Amorican	Rofined.
Nos. 10 to 16	₩ lb 2 1-10¢	2 8-10¢
17 to 20	₩ lb 2 2-10¢	2 9-10¢
21 to 24	₩ lb 2 3-10¢	3 ¢
25 and 26	₩ lb 2 4-10¢	3 1-10¢
27	₩ lb 2 5-10¢	3 2-10¢

Russia, Planished, &c.

	100 lbs.
Patent Planished, ₩ lb, A	$10.20 } 10%
Patent Planished, ₩ lb, B	9.20 } dis
Craig's Polished Sheet Steel	8¼¢

Galvanized.

Juniata, or first quality.....dis.75&10%

Copper—

Ingot.

Lake.....11 ¢ @ 11½¢
Casting Brands.....10 ¢ @ 10½¢

Sheet and Bolt.

Disconnt on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Disconnt on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... ....4¢

Sheet Zinc—

600 lb casks..... .....$4.75
800 lb casks,..... 4.95
Loose sheets..... 5.05

Solder—

½&½..... 9¼@10¢
Extra Wiping..... 8½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9½¢

Lead—

Soft Pig Lead.....8½¢
Bar.....4¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe—

1¼ and under, Plain.....70%
1¼ and under, Galv.....64%
1½ and over, Plain.....77%
1½ and over, Galv.....57½%
Boiler Tubes, list Oct. 24, 1892.....68%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Anstin's Corrugated.....65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd.....65%
Ritchie's Spiral Lock Seam, Galv'd....60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....65%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	8 @ 10
Iron Paint, Bright Red	₩ lb, 5 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Gronnd in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	62¢
Linseed Oil, Raw, in bbls	60¢
Mineral Paints	2@4¢
Orange Mineral	8¢
Pure White Lead in Oil	5½@5¾¢
Dry White Lead in bbls	4½@5½¢
Red Lead, American	5½@5¾¢
Red Venetian, English, dry	1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs	7½¢
Sipe's Japan Oil, in bbls, ₩ gal	34¢
Spirits Turpentine, in bbls., ₩ gal.	35¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.40
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.00
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.25
Roofing Pitch, lb bbl. of 300 lb	$2,8

NEW YORK, FEBRUARY 15, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots

Small lots.....₩ lb, 63¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 58¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots.....₩ lb, 60¢
100-lb lots.....₩ lb, 55¢
Ton lots.....₩ lb, 53¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots.....₩ lb, 55¢
100-lb lots.....₩ lb, 53¢
Ton lots.....₩ lb, 50¢

Antimony—

Cookson.....₩ lb, 9¼@9½¢
Hallett's.....₩ lb, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.	
¼-in. up to 2-in.	$0.35	25 @ 30%
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝-in.	.38	
⅜-in. up to ½-in.	.41	
5-16-in. up to ⅜ in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 19, inclusive	.38	

Copper and Bronze Tubing—

8¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square.*

Galvanized.....60&10%
Galvanized, Locked Joints.....60&10%
Tin.....60&10%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats. 19¢ ₩ lb, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10¼¢
Ansonia Grade Casting.....9¾¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:

Lap or Slip Joint, Galvanized.....70&5%
Lap or Slip Joint, Terne.....60&5%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb 2.25	2.60¢
Nos. 17 to 21	₩ lb. 2.35	2.70¢
Nos. 22 to 24	₩ lb, 2.45	2.80¢
Nos. 25 and 26	₩ lb. 2.55	2.90¢
No. 27	₩ lb. 2.65	3.00¢
No. 28	₩ lb, 2.75	3.10¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11@11½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75&5@75&10% off.
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3½@3⅝¢
Bar.....4@4½¢
Pipe.....5¼¢ 20%
Tin Lined Pipe.....12⅜¢ 20%
Block Tin Pipe.....30¢ 20%
Sheet.....6¼¢, 20%
Old Lead in exchange, 2¾¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....30%
Netting, Painted Sheets.....30%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's. 100 @ 500 lb	5¾
Lead, Amn. White, in oil	@ 5¾
Lead, Red, bbls. and ½ bbls	@ 5¾
Lead, Red, kegs	@ 5¾
Ocher, American	@ 1½
Red Venetian, American	@ 1½
Linseed Oil: Raw, ₩ gal	@ .56
Boiled	@ .59
Spirits Turpentine: In bbls	@ .30
Putty: In barrels and ½ bbls	.01½ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼

Roofing Material, &c.:

Asphaltum, Trinidad Refined, ₩ ton	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ lb	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.	$1.85
Roofing Pitch ₩ bbl	$2.25

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches	65&10%
Fittings, Pipe, " "	65&10&10%
Extra Heavy Pipe, " "	65&10&10%
Fittings, Heavy Pipe, " "	65&10&10%
Large sizes of both kinds	65&10%
Fittings for both kinds	65&10%

Pipe, Spiral—
Galvanized.....60%
Tin.....60%

Rock and Slag Wool—
	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¾	27¢
Rock Wool, extra	7¼	48½¢

Rosin—
Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.43@$1.44
Rosin, E. & F.....₩ bbl. $1.47½@$1.55
Rosin, G. & H.....₩ bbl. $1.65@$2.05
Rosin, I. & K.....₩ bbl $2.35@$2.60
Rosin, M. & N.....₩ bbl $2.75@$2 90

Seamless Brass Tubes..net
List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—
According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.70@ 4.00
Peach Bottom, ₩ sqr.....4.75@ 5.60
No. 1 Chapman, ₩ sqr.....3.90@ 4.25
Lehigh Slates, ₩ sqr.....8.00@ 4.50

Vermont:
Sea Green, ₩ sqr.....2.50@ 2.75
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—
Solder—
½&½, guaranteed.....11@11½¢
No. 1.....9½@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—
Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 lb, ₩ lb.....3½¢ } 5 % dis.
½ bbls., about 300 lb, ₩ lb.....4¢ } 5 % dis.
Kegs, about 110 lb, ₩ lb.....4¢ } 5 % dis.
75¢ extra for keg.
Kegs, about 55 lb, ₩ lb.....4¢ } 5 % dis.

Yager's Soldering Salts.
½-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—
Western Spelter.....4¢@4¼¢
Bertha (pure).....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers. Conductor—
Galvanized.....60%

Tin, Pigs and Bars—
Banca, pigs, ₩ lb.....15@15½¢
Straits, pigs, ₩ lb.....1 ½@15¢
Straits in bars, ₩ lb.....15½@16¢

Tin Plates—
American Terne Plates—
N. B.—The following Terne Plate quotations are for 20 x 28, unless otherwise specified; 14 x 20 Plates are half the prices given below.

Alaska (re-squared) IC.....$13.00
Alderly, extra quality, IC.....10.75
Allegheny, IC.....9.00
" IX.....11.50
Anchor, IC.....8.25
Apollo Roofing, IC.....11.00
" " " IX.....13.00
Black Diamond (Extra Coated), IC.....15.00
Bonus (Extra Coated), IC.....11.50
" " " IX.....14.50
Boston, IC.....12.50
Brooklyn, IC.....9.00
Capitol, IC.....8.50
Central, IC.....9.00
Climax, IC.....8.75
Columbia, IC.....12 50
" IX.....15 50
Columbus, IC.....9.50
Dunlap's Double Dipped, IC.....15.00
" " " IX.....17.00
" Domestic, IC.....10.00
Empire, IC.....10.25
Eureka, IC.....9.50
" IX.....12.00
Eureka, 200 lbs., IC.....9.25
Excelsior, IC.....9.50
Filbert, IC.....14.50
Flag, IC.....8.00
Florida, IC.....9.50
Flushing, IC.....12.50
Freeport (Hand dipped and Resquared), IC.....13.00
IX.....15.50
F. R. P., Extra, IC.....15.00
Globe, IC.....8 50
" IX.....11.00
Golden Star Old Style, IC.....15.00
" " " " IX.....18.00
Grace, IC.....8.50
Hamilton's Best Redipped, IC.....15.50
" " " IX.....18.50
Hickory (Resquared), IC.....11 00
J. L. O., IC.....9.25
Juniati, IC.....11.50
Juno, IC.....11.00
Kensington, IC.....13.50
" IX.....16.00
Knoxall, IC.....9 00
" IX.....12.00
Laufman's Apollo (Resquared), IC.....13.00
Laufman's Apollo (Resquared), IX.....15.50
Leominster, Extra Coated, IC.....11.50
Lion (Stamped), IC.....11.50
Lulu, IC.....10.50
" IX.....13.50
Maple, IC.....11.00
" IX.....14.00
Merchant's Roofing (Resquared), IC.....15.00
Meurer's Old Method, IC.....15.00
Meurer Roofing, IC.....14.00
National, IC.....11.00
Nava, IC.....10.00
" IX.....12.50
New Castle Old Method, IC.....18.00
New Castle Palm, IC.....14.50
Old Colony, IC.....15 00
Old Method, IC.....13.00
" IX.....16.00
Osborn's Old Process, IC.....14.00
" " " IX.....17.00
Osceola, Old Style, IC.....14.50
" " IX.....17.50
Pennsyl Old Method (Treble Coated), IC.....14.00
Phillips' Roofing, IC.....14.00
Phœnix, IC.....9.25
Pullman, IC.....11.50
Republic, IC.....9.50
Scott's Extra Coated (Resquared), IC.....16.00
Scott's Extra Coated (Resquared), IX.....19.00
Standard, IC.....8.50
Star IC.....10.50
" IX.....13 00
Superior, IC.....9.00
Taylor Old Style (Resquared), IC.....15 00
" " " IX.....18.00
The Taylor Roofing, IC.....12 50
" " " IX.....18.00
The Osborn Roofing, IC.....11.50
" " " IX.....14.00
Thomson's Puritan, IC.....14.00
Tip Top, IC (Resquared).....9.75
" IX " 12.25
Triumph, Old Style, IC.....15.00
" " IX.....18.00
U. S. Monongahela, IC.....12.20
U. S. Redipped, IC.....16.50
Venus, IC.....8 25
Waldo, IC.....11.50
Westmoreland, IC.....12.50
Willow, IC.....10 00
" IX.....13.00
Zero, IC.....9.00

American Bright Plates—
Almond, IC, 20 x 28.....$9.00
" IX, 20 x 28.....11.50
Brilliant (Tissue Packed), IC, 20x28 16.50
" " IX, 20x28 20.00
Brooklyn, IC, 14 x 20.....5.50
Century, IC, 14 x 20.....5.00
Climax, IC, 14 x 20.....4.75
Excelsior, IC, 14 x 20.....6.50
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....5.50
Florida, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Gladys IC, 14 x 20.....4.50
Hazel, IC, 14x20.....5.80
Ivy, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Linden IC, 20 x 28.....10.00
" IX, 20 x 28.....12.50
Mars, IC, 14 x 20.....4.50
" IX, 14 x 20.....5.50
Merchant's Dipped, IC, 14x20.....10.00
Merion, IC, 20 x 28.....11.00
" IX, 20 x 28.....14.00
Mint, IC, 20x28.....8.50
" IX, 20x28.....11.00
New Castle Best Palm Charcoal, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
New Castle Palm Charcoal, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.00
New Castle, Charcoal, IC, 14 x 20.....6 25
" " IX, 14 x 20.....7.50
New Castle, S. Charcoal, IC, 14 x 20.....6.00
" " IX, 14 x 20.....7.25
New Castle Palm Coke, IC, 14 x 20.....5.75
" " IX, 14 x 20.....6.85
New Castle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Oak, IC, 14 x 20.....4.75
Palma, IC, 14x20.....6.00
Pansy, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.00
Phœnix, IC, 14x20.....5.25
" IX, 14x20.....6.50
Royal, IC, 20x28.....12.00
" IX, 20x28.....15.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Walnut, IC, 14 x 20.....4.65
Youghiogheny, IC, 14 x 20.....6.00

Imported Terne Plates—
Charcoal.
MF Grade, IC, 14 x 20.....$6.25
20 x 28.....12.50
Pontymister Old Style Grade, IC, 14 x 20.....5.50
20 x 28.....11.00
IX, 14 x 20.....6.50
20 x 28.....13.00
Worcester Grade, IC, 14 x 20.....4.50
20 x 28.....9.00
IX, 14 x 20.....5 75
20 x 28.....11.50
Dean Grade.—IC, 14 x 20.....4.25
20 x 28.....8.50
IX, 14 x 20.....5.50
20 x 28.....11.00
Abercarne Grade.—IC, 14 x 20.....4.00
20 x 28.....8.00
IX, 14 x 20.....5.50
20 x 28.....11.00
Mansel Grade, IC, 20 x 28.....8.00

Imported Bright Plates—
Charcoal.
Duty: 2.2¢ ₩ lb.
Melyn and Calland Grade. IC, 10 x 14.....$5.25
" " IC, 12 x 12.....5.50
" " IC, 14 x 20.....5.25
" " IC, 20 x 28.....10.50
" " IX, 10 x 14.....6.50
" " IX, 12 x 12.....7.00
" " IX, 14 x 20.....6.50
" " IX, 20 x 28.....13.00
" " DC, 12½ x 17.....5.00
" " DX, 12½ x 17.....6.50
Allaway Grade. IC, 10 x 14.....4.75
" " IC, 12 x 12.....5.00
" " IC, 14 x 20.....4 75
" " IC, 20 x 28.....9.50
" " IX, 10 x 14.....5.50
" " IX, 12 x 12.....5.75
" " IX, 14 x 20.....5.50
" " IX, 20 x 28.....1.00
" " DC, 12½ x 17.....4.25
" " DX, 12½ x 17.....5.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....4.25
10x20.....6.50
20x28.....8.50
IX, 10x14, 14x20.....5.25
B. V. Grade.—IC, 10x14, 14x20.....4.25

Imported Boiler Plates.—
IXX, 14x26..(112 sheets).....$11.50
IXX, 14x28..(112 sheets).....11.90
IXX, 14x31..(112 sheets).....13.25

Tinning—
Brass and Copper.....

Tubing—
Tin.....55%
Galvanized.....55%

Brass and Copper.—
Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks, Stove—
Improved Lock Frame, per doz.....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—
List Feb. 1, 1895.
1¼ and under, Plain.....70%
1¼ and under, Galv.....64%
1½ and over, Plain.....77%
1½ and over, Galv.....68%
Boiler Tubes.....75@77½%
Screw and Socket Joint Casing.....65%
Inserted Joints Casing.....60%

Zinc—
600 lb casks.....₩ lb 4¾¢
Per lb.....5¼¢

MANUFACTURING.

Hardware.

The Consolidated Barb Wire Company of Lawrence, Kansas, have secured the wire mill of the defunct Clark & Winsor Wire & Spring Company at Joliet, Ill., and are now drawing wire. They will manufacture barb wire as soon as they can put up the machines, and it is also their purpose to manufacture wire nails. The company have a large plant at Lawrence, Kansas, recently enlarged and greatly improved, but they find that some of their trade can be more conveniently handled from Joliet.

The Ansonia Brass and Copper Company, Ansonia, Conn., have leased the factory formerly occupied by the Aluminum Brass and Bronze Company, Bridgeport, Conn.

The plant of the Eureka Mower Company, Utica, N. Y., was damaged by fire to the extent of $25,000 on the 5th inst.

An addition is to be erected at the works of Henry Disston & Sons, Philadelphia, which will be set apart for the testing of saws.

P. C. Sweeney has bought the plant of William Wilkinson & Co., sheep shear and cutlery manufacturers, Reading, Pa., and a stock company will be organized to continue the business.

Moore Bros., saw manufacturers, Jamestown, N. Y., will erect a new iron clad building, 50 x 24 feet.

The annual meeting of the Walter A. Wood Mowing & Reaping Machine Company, Hoosick Falls, N. Y., was held on January 31. The old board of officers was re-elected as follows: C. E. Dudley Tibbits, president; William S. Nicholls, vice-president; Danforth Geer, secretary; N. E. Russell, general manager. The directors elected were the following: C. E. Dudley Tibbits, Walter P. Warren, William S. Nicholls, LeGrand C. Tibbits, J. Russell Parsons, C. A. Cheney, N. E. Russell, John Wool Griswold and Danforth Geer.

The Syracuse Arms Company, Syracuse, N. Y., have increased their board of directors from five to seven of the stockholders. The new board is composed of George Timmins, Alexander Grant, F. S. Wicks, J. M. Colwell, F. B. Scott, Robert Croasdale and George G. Fryer.

Machinery.

At Akron, Ohio, in the case of Brownell & Co. of Dayton, Ohio, *vs.* the J. C. McNeil Boiler Company of Akron, Ohio, for balance on a flanging machine furnished by plaintiffs, the defendants have filed an answer and counter claim. They admit entering into a contract for a flanging machine to cost $2600, and that it was delivered January 10, 1893, but say that the machine would not do the work claimed for it. For a foundation built to place the machine on, for the loss sustained by its poor work, and for some $666.66 paid on account, they claim $3735.33, for which they ask judgment.

The James E. Thomas Company of Newark, Ohio, have recently added a No. 6 Whiting cupola to their foundry, which enables this concern to largely increase their output of ingot molds and similar castings.

The firm composed of Ernest G. Rippel and James T. King, in the machine and foundry business under the name and style of Rippel & King, Canal Dover, Ohio, were, yb mutual consent, dissolved on January 28, 1895, James T. King retiring. Ernest G. Rippel, who has purchased all the assets and assumed all the liabilities of the firm, will remain and carry on the business as usual in the same place under the style of the Rippel Manufacturing Company. The firm make a specialty of rolling mill and blast furnace castings.

Armstrong Brothers, boiler manufacturers, Springfield, Ohio, have been awarded the coutract for eight boilers, 65 inches in diameter by 20 feet long, each containing 22 tubes, 6 inches in diameter, riveted into the heads, for the new works of the National Tin Plate Company of Anderson, Ind. These boilers are to be completed with full flush fronts, all castings, fittings and stacks, and are to be suspended in furnaces by heavy eye beams. The approximate horse-power of the order is 1600.

The Morton Tin Plate Company, Cambridge, Ohio, have placed an order for two five-roll Morewood tiuning sets with the Lloyd Booth Company, Youngstown, Ohio.

Wm. B. Pollock & Co., Youngstown, Ohio, have been awarded a contract for a large amount of steel rivet pipe to be furnished the water works department of Clevelaud, Ohio. The contract amounts to $11,800.

The Cook-Stoddard Mfg. Company, have been organized at Dayton, Ohio, for the manufacture of gas engiues under patents owned by the company. The capital stock is $30,000.

The stockholders of the American Cotton Picking Company met at Pittsburgh last week and elected the following directors: George C. Chalfant, Homer Laughlin, T. J. Keenan, John B. Keaggy, Thomas R. Morris, A. Campbell, W. J. Morris.

The Babcock & Wilcox Company, through their Pittsburgh agent, have closed a contract with Pickands, Mather & Company, Cleveland, Ohio, to furuish 1500 horse-power high pressure boilers, to carry 250 pounds pressure, to be used on a freight vessel now being built by the Chicago Ship Buildiug Company. A contract for the same amount of boilers has been received from a concern located in the vicinity of the lakes, to be used on a passenger vessel.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

One or two good SNAP MOLDERS to work on stove plate work. Ohio Stove Company, Portsmouth, Oblo. Feb. 16

COMMISSION SALESMEN wanted on side line; goods sell from small samples and illustrated catalogue, mainly to hardware, house furnisbing, crockery, dry goods and bazar trades; state territory. "Staple Goods," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

SUPERINTENDENT.—A gasoline and gas stove factory desires to engage a first-class man to take cbarge of its works; must have held a simllar position with a leading house, be able to make calculations of cost and be fully posted on everything in the gasoline and gas stove line; none but first-class men need apply; tbis is a good opening for the right man. Address, witb full particulars as to experience, references and salary wanted, "Executive Ability," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 16

JAPANNER—FOREMAN for japan sbop in large Western city; must be thoroughly conversant witb modern methods of japanning tinware, and be a good manager. Address, giving references, and stating salary wanted, "Japan," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

At once, a good sober man wbo can prove himself a first-class TINNER by his work and is able to do a good job on iron pipe work; the right man can secure steady work. J. S. Barton, Abingdon, Ill. Feb. 16

A first-class JAPANNER on carriage lamps; a good position is open to a man who knows his business. M. T. Gleeson Mfg. Company, Columbus, Ohio. Feb. 16

A SALESMAN to travel tbe territory of Micbigan and Ohio and a portion of Pennsylvania; must bave experience as traveling salesman and be competent to design steam and water heating apparatus and sell the goods; give reference and salary required and state experience. "Territory," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 9

One good all round TIN, GALVANIZED IRON CORNICE and SLATE WORKER; steady work; good wages; must work on trial. Address "E. J.," 68 West Main street, Lexington, Ky. Feb. 9

Competent RETINNER for black and tinned work; state experience and wages expected. The Chicago Stamping Company, Chicago, Ill. Feb. 9

A practical PLUMBER and GASFITTER; one capable of estimating from plans and specifications, can secure a good interest in an old established firm; married man preferred. "Hardware," 130 West Fulton street, Grand Rapids, Mich. Feb. 9

By Eastern representative, a SALESMAN acquainted with wholesale hardware and rubber goods trade in New York City to sell specialties on commission. "A. H. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 9

SALESMAN in every State to sell as side line our steel roofing, corrugated iron, conductor, eave trougb, &c.; product of a large concern. "Rare Chance," office of *The Metal Worker*. 96-102 Reade street, New York City. Feb. 9

SITUATIONS WANTED.

By a first-class TIN and SHEET IRON WORKER; 20 years' experience; specialty, bot air and hot blast heating and ventilating work for the last ten years; at present time foreman for a large firm in Milwaukee. Wm. Schmidt, 697 Twelfth street, Milwaukee, Wis. Feb. 16

By a young man, 22 years of age, as SHIPPING or ENTRY CLERK; city or country; accurate, honest, temperate, rapid penman; knowledge of plumbing and bardware; can give bond. A. E. MacLean, Tremont, New York City. Feb. 16

A RETINNER of wide experience and well posted in all lines, and of progressive ideas and up to the times, desires a situation where energy and ability can be appreciated; first-class references. "Progress," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 16

In a foundry, by a STOVE PATTERN MAKER and CARVER, with 20 years' experience; competent to make tbe patterns, including tbe carving, with mechanical and ornamental designs; fair wages. A. Genius, 426 John street, Lansingburg, N. Y. Feb. 16

By a young man 22 years of age, as TIN ROOFER, CORNICE and SKYLIGHT MAKER; moderate salary; New York City preferred. T. Kesler, 88 Willett street, cigar store, New York City. Feb. 16

Steady position wanted by a first-class LEAD BURNER and TINSMITH. "R. L," 229 Tenth avenuc, New York City. Feb. 16

Manufacturers of OIL and GASOLINE STOVES, after March 1 I will be at liberty to push the sale of any line of gasoline stoves in any territory; my record and ability for your inspection. Abe Lincoln, Jr., Soutb Bend, Ind. Feb. 16

FOUNDRY FOREMAN open for an engagement in New York or vicinity; 15 years' practical experience as foreman on stove plate, bench and jobbing work; best of references. "C. W. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

By a good TINSMITH at outside work; can speak Englisb and German; wages moderate; city or country. H. Marcuse, 175 Harrison avenue, Brooklyn, N. Y. Feb. 16

By a PLUMBER, STEAM and HOT WATER FITTER, who can do tin and galvanized iron, furnace and pump work; estimate on work from plans or can make plans for any of tbe above work; first-class workman; reference. W. H. La Fleur, 312 Horsman street, Rockford, Ill. Feb. 16

MECHANICAL SALESMAN open for engagement in New York and vicinity for furnace, range and stove line, &c. "Salesman," 327 Harrison street, Newark, N. J. Feb. 16

By a PLUMBER, STEAM, GAS and HOT WATER FITTER, witb knowledge of other work, a steady job; a good mechanic in every particular. Frank Slingland, West Haven, Conn. Feb. 16

By a first-class PLUMBER, ten years' practical experience, steady position wanted in any part of the United States; can furnish A1 reference. Jas. P. Godsill, 1073 Third avenue, New York City. Feb. 16

By a boy, 19 years of age, who has had four years' experience in a tin shop; would prefer a place where he can learn the plumbing trade; excellent references; willing to work for reasonable wages. Wm. Wittenberg, Tell City, Ird. Feb. 16

By an experienced man who understands galvanizing and retinning all kinds of stamped and hollow ware and milk can trimmings; 20 years' experience; best of references from the East or Cbicago; can take charge of a plant of any size. Jno. J. Duffy, 1189 Congress street, Cbicago, Ill. Feb. 16

By a good GENERAL JOBBER at tinning, plumbing ane heating; eight years' experience; 24 years of age; references; position desired by April 1. H. Ridge, Katonah, N. Y. Feb. 16

As ASSISTANT FOREMAN in a first-class cornice shop; thoroughly competent; expert on brakes, good on raised work, first-class on skylights; wages moderate; steady position at inside work wanted. Thos. J. McNamara, 256 Ewen street, Brooklyn, N. Y. Feb. 16

By a TINSMITH HELPER; two years' experience; would like to finish trade; wages moderate. J. Ratigan, 1040 Atlantic avenue, Brooklyn, N. Y. Feb. 16

As SALESMAN, or to take charge of a heating department in steam, water, combination or warm air; would take the management of a plumbing and beating business. "Experience," No. 216, office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

By a young man 23 years of age, who bas had five years' experience at tin and sheet iron work, stove repairing and the house furnishing goods business; fair knowledge of plumbing; steady position wanted with responsible parties; best of references. F. W. Thomas, 436 East Jefferson street, Williamsport, Pa. Feb. 16

On or before April 1, by a steady, strictly temperate and reliable TINNER, with five years' experience on roofing, spouting, pumps, farm implements and general work; furnace work a specialty; good references; Illinois, Indiana or Kentucky preferred. W. A. Salter, Nora Springs, Iowa. Feb. 16

By a TINNER; 18 years' experience at all branches of tin and furnace work; sober and steady. James Porter, 164 Ft. Wayne avenue, Indiauapolis, Ind. Feb. 16

By a good METAL WORKER who understands the gas fixture business; 25 years' experience; best of references. "G. D.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

MECHANICAL ENGINEER, well up in machinery, steam engineering, foundry work, &c., would like to take charge of mechanical department of trade paper—answering inquiries, working up general matters of interest to mechanics, engineers, &c; journals needing such assistance address "Engineer," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

By a STENOGRAPHER; a beginner; good speller; moderate salary. "Stenographer," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

By a strong man, 32 years of age, LOCKSMITH and ENGINEER; understand the forge. L. Artbus, 402 East Twenty-fourtb street, New York City. Feb. 16

By a first-class CORNICE, SKYLIGHT and JOB WORKER, CUTTER and DRAFTSMAN; can estimate from plans, take charge of any number of men and bandle to tbe best advantage. "Cornice Cutter," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 9

By a TINSMITH who thoroughly understands hot water heating, furnace and range work; fair knowledge of plumbing; German; married; steady position wanted. "William," care A. Maas, 339 East Twenty-second street, New York City. Feb. 9

By a reliable TINSMITH who is a good roofer and general outside workman; references if desired. James T. Cranston, 42 Anson street, Derby, Conn. Feb. 9

As CUTTER or FOREMAN in a cornice sbop; first class draftsman; capable at all branches of the business; 20 years' experience. A. Johnson, 543 East Tbirteentb street, New York City. Feb. 9

By a TIN, COPPER and SHEET IRON WORKER; 20 years' experience at all branches of the trade; first-class jobber and bencb worker; expert on furnace work; reasonable wages. E. Harriott, 556 West 126tb street, New York City. Feb. 9

By a METAL PATTERN MAKER in or near New York; 10 years' experience. D. McCance, 186 Summer avenue, Newark, N. J. Feb. 9

A man 29 years of age would like to engage with a firm doing a large manufacturing business who require the service of a careful mechanic with a practical knowledge of macbinery; also ability to design machines for special work, make drawings, &c.; strictly temperate, industrious and reliable; will engage for the first year at $2.50 per day. "J. L," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 9

Steady job wanted by a first-class PLUMBER in city or country; wages moderate. John Pratt, 630 Tbird avenue, New York City. Feb. 9

Steady employment desired by a first-class PLUMBER in city or country. Conrad Smallen, 64 West 101st street, New York City. Feb. 9

By a young man, as PLUMBER and GASFITTER; wages moderate; city or country. O. D. Burt, West Berkshire, Vt. Feb. 9

By a first-class tinner, as FOREMAN; understands steam and hot water beating and plumbing; first-class references. E. E. Dugroat, 10 Elm street, Morristown, N. J. Feb. 9

By a young man with three years' experience at the plumbing trade; can wipe a good joint; would like a steady job. Edward Kiernan, Wood avenue, above North, Bridgeport, Conn. Feb. 9

Steady job by a young man as TINNER; six years at outside work. "Tinner," 160 Middle street, Bridgeport, Conn. Feb. 9

Steady job wanted by a young man as TINSMITH; inside work preferred; wages moderate. Thomas Wall, 200 Navy street, Brooklyn, N. Y. Feb. 9

By a young married man as TINSMITH; nine years' experience at city and country work. Fred Waxman, 1521 Avenue A, New York City. Feb. 9

By a young man, 24 years old, as TINNER; can clerk in hardware store; strictly temperate and honest; best of references furnished; job preferred in country town in Pennsylvania or Ohio. Rush B. Miller, Fulton, Mich. Feb. 9

As SALESMAN on the road or CLERK in store; nine years' experience in stove, range, and tin store. "Tinner," Danville, Ky. Feb. 9

A gentleman who has had about seven years' experience in the stove, range, tin roofing and furnace business desires a position as TRAVELING SALESMAN for some house; will satisfy as far as energy and push go. "W. H.," care Box 566, Lexington, Ky. Feb. 9

As PLUMBER; strictly sober, neat and quick workman wants work in city or country; 20 years at trade; understands plans thoroughly; can guarantee first-class work done; best of references. Edward Moran, 181 East 111tb street, New York City. Feb. 9

Special Notices.

FOR SALE.

A first-class 8-foot Beader made by Niagara Stamping & Tool Co. and a Corrugating Machine, fitted for both hand power and belts, corrugating 3 in. and 4 in. conductor, made by Geo. C. Keene & Co. of Cincinnati, O. Both these machines are in excellent order. For further information address

THE SIMS MFG. CO., Newark, O.

FOR SALE.

Patent Steel Roofing, with the necessary tools for applying electros for advertising, &c. Trade established. Good opportunity now open. Reasons can be given on application. Address

"COLUMBIA,"

office of *The Metal Worker*, 96 102 Reade Street, New York.

FOR SALE.

No. 7 Sturtevant Blower, only short time in use. Address

EUGENE MUNSELL & CO.,
218 Water St., New York.

FOR SALE.

In a growing town in Central Massachusetts, a Stove, Tin, Plumbing and Heating business. Water works just being introduced in the town. Capital required $1500. Address "B. E. L.," office of *The Metal Worker*, 96-102 Reade St., New York.

WANTED,

tenders to furnish one hundred thousand nipples, two inches outside diameter, one-sixteenth inch thick, one and one-quarter inches long, wrought iron or steel. Address

"H. H. H.,"

office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo.

WANTED.

Base Burner line of Hard Coal Stoves, by a stove manufacturer whose representatives cover the States of Michigan, Wisconsin, Indiana, Illinois, Missouri, Iowa and Western Ohio. Manufacturers having a line of this kind and wishing their goods sold through a manufacturer may send catalogue of their 18 5 stoves. Address "STOVE MANUFACTURER," office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, O.

AN OLD ESTABLISHED Stove, Tin and House Furnishing business with good jobbing trade Plumbing, Roofing and Furnace Work. Located on one of the best avenues in New York City, with full set of Plumbers' and Tinners' Tools and Machines, also horse and wagon, with privliege of doing business under owner's name. Good reason for selling. Business established 30 years. Address

"ESTABLISHED,"

office of *The Metal Worker*, 96-102 Reade St., New York.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

A paying Hardware, Stove and Tinware business finely located in New England. Stock comprises a full line of Hardware, Paints, Oils, Tinware and Woodenware Have good trade in Steam Fitting, Plumbing, Tin and Sheet Iron work. Exceptional inducements will be offered to right man. Address

"EXCEPTIONAL"

office of *The Metal Worker*, 96-102 Reade St., New York.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

Special Notices.

FOR SALE.

The leading stove store in a growing manufacturing city of 20,000, near New York. This is an old, and the best business stand in the city. Large store and moderate rent. We do Steam and Hot Water and Hot Air Heating, Plumbing and Tinning. This is a good investment, but present owner has too much other business to see to. Can inventory down to $3000. Address "A. A.," No. 119 office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

The Williams Printing Co.,

Commercial Printers, and Binders.

Estimates Furnished for all Classes of Work.

96-102 Reade St., - New York.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.
PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.
E. B. STOCKING, Attorney at Law, 611 F ST., N. W., WASHINGTON, D. C.

Special Notices.

$2000

will buy a full stock of Stoves and House Furnishing Goods with complete sets of Plumbers' and Tinners' Tools, also good stock of Iron Pipe, Fittings, &c. Location the best. Town good. Stock can be reduced some if desired. Purchaser has control of entire Plumbing trade. Best reasons for selling. Business was established in 1865. Address "RETIRED," office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE or TO LEASE.

An established Plumbing and House Furnishing business at Narragansett Pier, R. I. Inquire of W. H. GRIFFITH & CO., on premises, or address D. D. CLARK, Westerley, R. I.

FOR SALE.

A No. 8 Sturtevant Blower, Countershaft and Pulley complete. This blower has been melting from 10 to 12 tons of iron per hour. Address

SCANLAN & CO.,
Louisville, K

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,

Solicitors of Patents.

OFFICES:
PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 88 Park Row.
WASHINGTON,
Atlantic Building, 928 F. St.

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address

"STOVE FOUNDRY,"

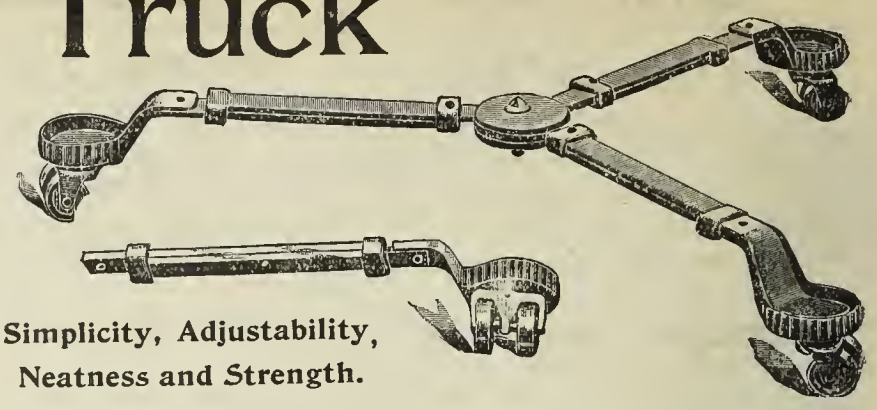
Office of *The Metal Worker*, 96-102 Reade Street, New York.

Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

Gem Stove Truck



Not only accommodates itself to a stove with four legs, but, as shown in illustration, is equally as complete with a stove of three legs, a feature no other truck possesses. The adjustment is so perfect that one man can mount any ordinary stove with ease. Price, $30.00 per dozen. 1-3 doz. in neat case.

DISCOUNT TO THE TRADE.

Address **CHAS. F. FOX, - DAYTON, O.**

Simplicity, Adjustability, Neatness and Strength.

HOW TO KEEP A STORE.

By S. H. TERRY.

406 PAGES, 5x7½ INCHES.

This book should be in the hands of every one interested in the selling of goods at retail. Among the subjects discussed are: The selection of a business; choice of a locality; buying a stock of goods; examining, marking and arranging goods; how to advertise; employment of clerks; selling for cash and credit; keeping accounts; expenses; copartnerships; losses by fire, theft, &c.; influences of social life on business; buying at auction; investment of profits; insolvency; business qualifications. Every branch of the retail trade is treated upon in a direct, business-like manner. It is a thoroughly practical book for merchants and clerks. **Price, $1.50.**

Sent, postpaid, on receipt of Price, by

DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, N. Y.



SOMETHING NEW.

The Little Giant Steel Truck. Strong, Light.

ENTIRELY OF

METAL AND AT A VERY LOW PRICE.

Write for Circulars and Prices to the Manufacturers,

THE G. L. VAN NAMEE MFG. CO.,

Gouverneur, N. Y., U. S. A.

NEW HAMPSHIRE MICA IS THE BEST.

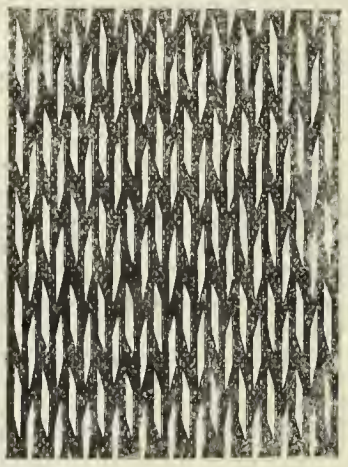
The F. E. BELDEN MICA MINING CO.,

12 Broad St., Boston, Mass.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Prop.,
88 Fulton St., N. Y.



SHEET METAL LATH.

Improved METALLIC LATHING is now being used in construction of all modern buildings, being FIRE-PROOF, RIGID, with ample keying qualities, and is easily applied, and embraces a material saving in plaster if necessary.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted and Corrugated Leader, cheapest and best in the market. Sheet iron piping, Stove Pipe and Fittings of every description.

General Galvanizing to Order.

The Jersey City Galvanizing Co. Manufacturers and Jobbers in

Galvanized Material of Every Description.

Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE OF OUR SPECIALTIES.

MICA NORTH CAROLINA WYOMING, AMBER.

EUGENE MUNSELL & CO.,

218 Water Street, NEW YORK.

MICA

MICA OF ALL GRADES

—FOR—

STOVES and Mechanical Purposes.

PALERMO MICA CO.,

Miners and Importers and Wholesale Dealers,

S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.

SLATE FOR ROOFING AND BLACKBOARDS.

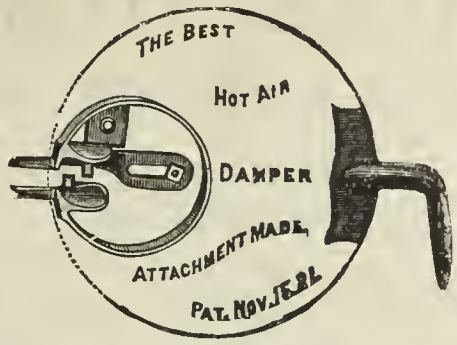
SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS.

AULD & CONGER,

100 EUCLID AVE., CLEVELAND, OHIO.

Crown Damper and Crown Damper Attachment.





NICKEL PLATED HANDLE. PUT UP 1 DOZ. IN A BOX.

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

AMERICAN Dampers and Clips.

WAFFLE IRONS.

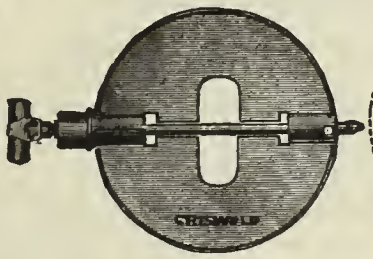
THE BEST



For Gas or Gasoline Stoves.

Easy to Clean, Long Wood Handles.

BUY *NO OTHER.*



Wood or Nickel Handle.

BEST SELLER.

ASK FOR THE

AMERICAN.

Buy no Other.



JUST OUT.

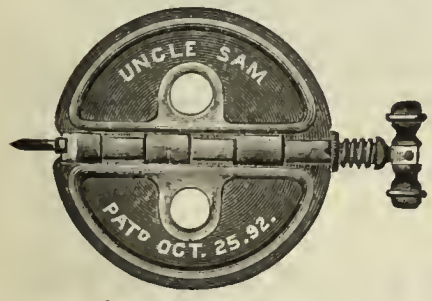
BEST CLIP MADE.

Send for Samples.

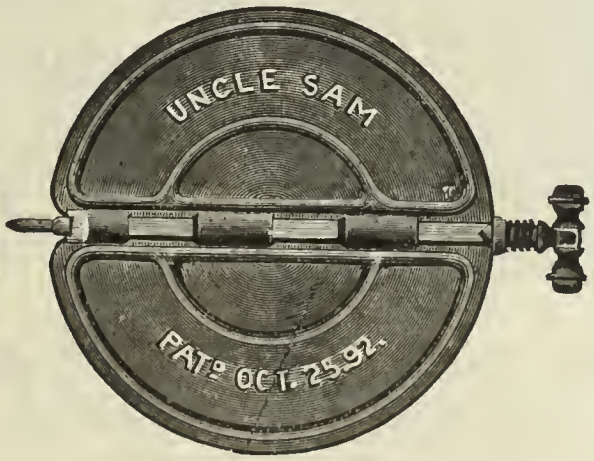
GRISWOLD MFG. CO.,

ERIE, PA.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers



W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.

Manufacturers of

Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application



SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

48 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

DAVID WILLIAMS,

PUBLISHER,

96-102 Reade St., New York.

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

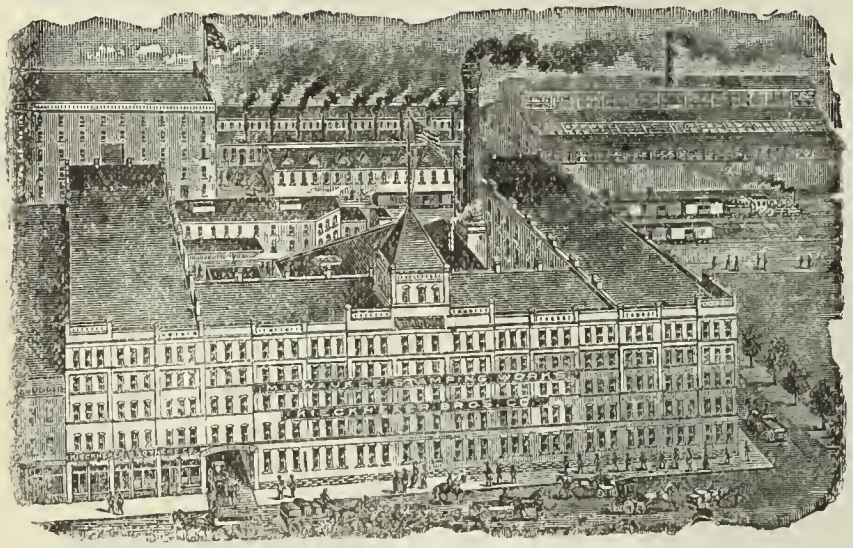


Agents for SPLENDID OIL COOKING STOVES
and MAJESTIC OIL HEATING STOVES,

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

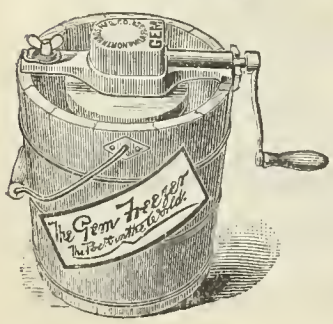
PLAIN, RETINNED, GALVANIZED,
JAPANNED AND ENAMELED
PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

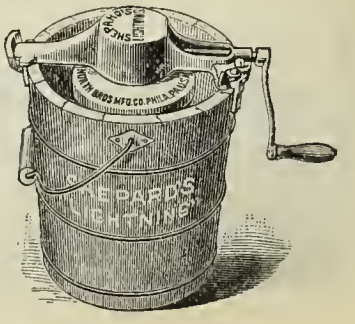
SEND FOR CATALOGUE AND PRICES.

WE CHALLENGE THE CLAIM



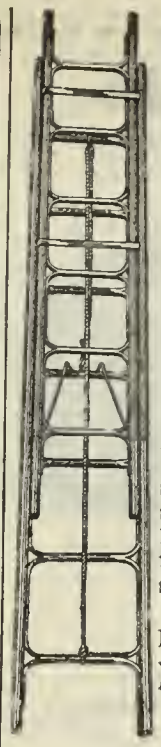
THAT ICE CREAM CAN BE FROZEN
ANY MORE QUICKLY
IN ANY FREEZER MADE
THAN IN OUR

"LIGHTNING" or "GEM."



NORTH BROS. MFG. CO., Philadelphia, Pa.





Look at this Ladder.

THE PATENT BENT RUNG LADDER.

The Strongest, Lightest and Best Ladder Made.

A sixteen-foot ladder only weighs 21 pounds. Extension ladders of this kind are easily put up and taken down by a boy. Our double and single step ladders have no equal. A six-foot step ladder will carry 1000 pounds, and will last three times as long as the old style step ladder.

Write for catalogue and price-list.

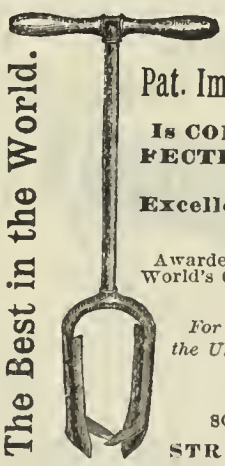
Indiana Ladder Co.,

INDIANA, PENNSYLVANIA.



The largest and best assorted stock in America. All requisites for the draughting room. We have made a study of this line and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable.

CATALOGUE ON APPLICATION.



The Best in the World.

IWAN'S

Pat. Improved Post Hole Auger

Is CONVENIENT and EFFECTIVE IN OPERATION.

Excellence of Material and Construction.

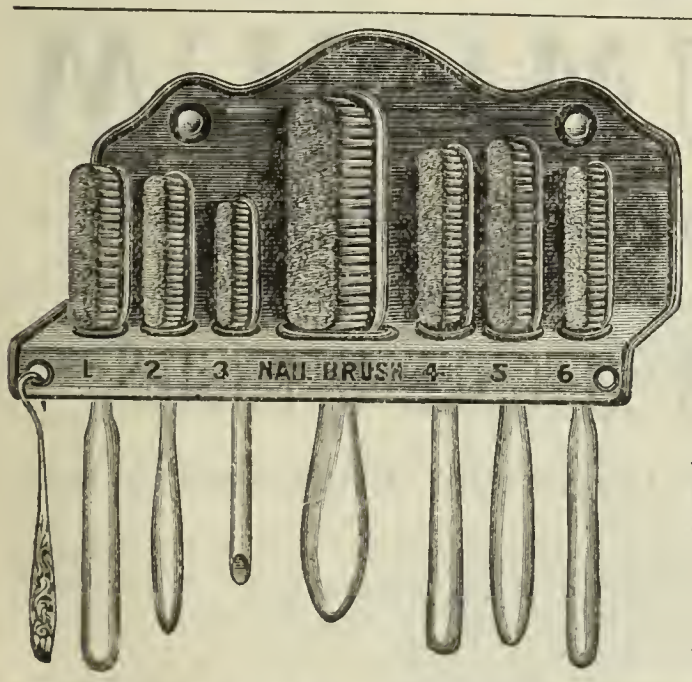
Awarded Medal and Diploma at the World's Columbian Exposition, 1893.

For sale by all leading jobbers in the U. S. and Canada.

IWAN BROS.,

SOLE MANUFACTURERS,

STREATOR, - ILL.



The "Jewel"

Tooth and Nail Brush Holder.

(Patented Feb. 6, 1894.)

THIS new and novel article fills a long-felt want for an attractive, durable and useful Tooth and Nail Brush Holder. It will hold any size brush, and, as each openin is numbered, the brushes are kept separate and there is no possibility of getting the wrong one. The ornamentation is lithographed on the surface, and it will not peel or wear off.

For sale by all first-class jobbers in House Furnishing Goods, Hardware, Druggist Sundries and Department Stores. Sample mailed on receipt of 15 cents.

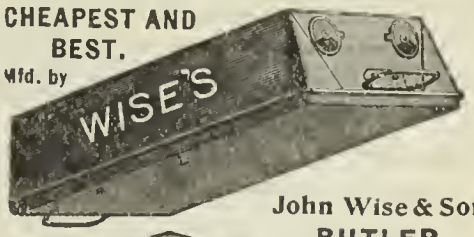
KEEN & HAGERTY,

32 S. Calvert Street,

BALTO., MD.

CHEAPEST AND BEST.

Mfd. by



John Wise & Son,

BUTLER,

O.



N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

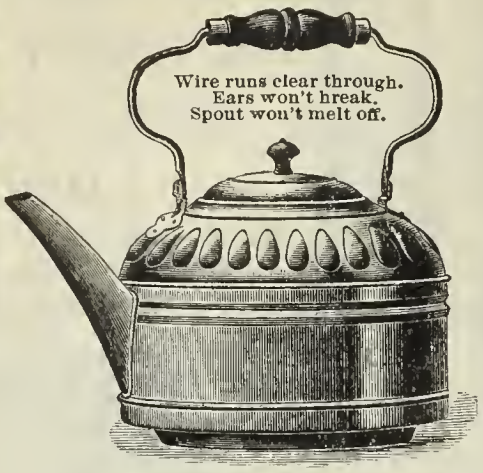
Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

— A DIRECTOR.—Lawyer: "Did I understand you to say that your son was one of the directors of the Equitable Life Assurance Company?"

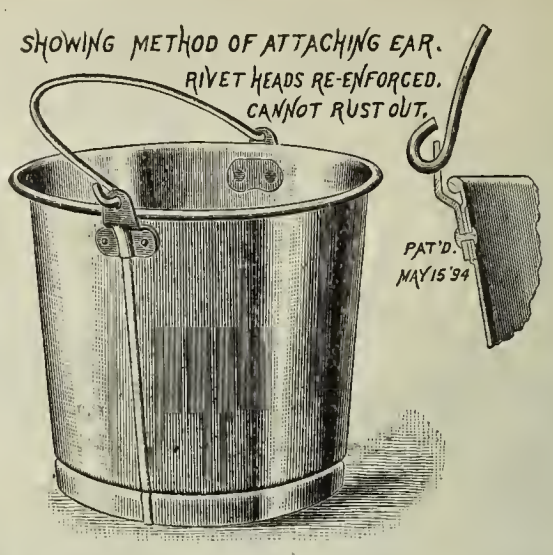
Mrs. Muggs: "Why, yes, you must know him; he's that tall fellow who stands in the hallway and directs the people to the elevators."—*Exchange.*



LATEST "ROCHESTER."
Patent pending.



"ROCHESTER."
Patented.



WRITE FOR OUR

It is full of Good Things !

1895

CATALOGUE.

One of these will last a lifetime !

WILL BE A GOOD YEAR IF YOU HANDLE "ROCHESTER" GOODS.

LARGEST LINE. LATEST PATTERNS.

NOTE.—It has always been our aim to furnish the **best goods** at prices which are as low as is consistent with first-class workmanship.

Have you seen our new line of "**extra heavy**" nickel plated copper tea kettles? They will help hold your trade. **White satin finish inside.**

ROCHESTER STAMPING WORKS, - - ROCHESTER, N. Y.

ROYAL

WASH BOILER HANDLE.



PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,
116 N. 2d St., PHILADELPHIA, PA.

The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O,

We Carry Stock and can Supply all Kinds of

ALUMINUM

Sheets, Ingots, Wire, Rods, Etc.

WE ARE MANUFACTURERS OF

ALUMINUM KITCHEN UTENSILS,

Which are Fast Displacing Enameled Ware.

Aluminum Ware does not rust or flake off and is very durable. Foods cooked in it do not scorch. Light and beautiful. A line which will interest every customer and please every purchaser.

SIDNEY SHEPARD & CO., BUFFALO and CHICAGO.

C. W. WELLS, New England Sales Agent, 19 Pearl St., Boston.



ALUMINUM

Ingots, Sheets, Rods, Tubes, Wire and Castings,
Cooking Utensils and Tableware,
Tea and Coffee Pots, Chafing Dishes, Rice Boilers, &c.
Write for New Catalogue.

THE WOHLER ALUMINUM COMPANY,
55 Jackson Street, - - - - Chicago, Ill.

F. H. LAWSON, Pres.
FENTON LAWSON, Vice-Pres.
WILLIAM C. LAWSON, Treas.
F. ROGERS LAWSON, Secy.

ESTABLISHED 1816

THOMAS LAWSON. 1816 — 1841.
FENTON LAWSON. 1824 — 1853.
GEO. P. LAWSON. 1852 — 1854.
F. H. LAWSON. 1852 —

WM. G. COFFIN. 1854 — 1883.
FENTON LAWSON 1878 —
WM. C. LAWSON. 1886 —
F. ROGERS LAWSON 1894 —



OFFICE AND SALES DEPARTMENT.
186-188-190
MAIN ST.
CINCINNATI, O.

IMPORTERS OF AND DEALERS IN TIN PLATE, COPPER, BRASS, GALVANIZED SHEET IRON, REFINED SHEET IRON, TINNERS' TOOLS AND MACHINES, TINNERS' SUPPLIES, ETC.

LAWSON'S OLD PROCESS GUARANTEED ROOFING PLATE

MANUFACTURERS OF . . . .
Pieced Tin Ware, Japanned Ware,
Galvanized Iron Ware, Toilet Ware,
Water Coolers, Coal Vases, Street Lamps,
Galvanized Oil Tanks and Cans,
AND OTHER SPECIALTIES.



FACTORY BANK AND OSIRIS ST.

"We are Advertised by our Loving Friends."



Pat. Jan. 19th, 1895.

Look Here,

Hardware and Housefurnishing Dealers. An article you **must** keep is the wonderfully popular

Crusty Bread Pan.

The most perfect bread baker ever made. Every lady trying it acknowledges that. **Tests make customers** for this pan, and **that is a fact.** The Clark-Sawyer Co., a big Department Store of Worcester, Mass., say: "They are a good thing, and will make their own way, if people can be made to give them a trial." Your jobber must be in the list below. Write them for prices. They all carry this popular pan in stock.

MADE ONLY BY

The Niles Mfg. Co.,

NILES, OHIO.

HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ill.
HORTON, GILMORE, McWILLIAMS & CO., Milwaukee, Wis.
WM. FRANKFURTH HARDWARE CO., St. Paul, Minn.
JOHN PRITZLAFF HARDWARE CO., Winona, Minn.
FARWELL, OZMUN, KIRK & CO., St. Louis, Mo.
R. D. CONE CO., Kansas City, Mo.
A. F. SHAPLEIGH HARDWARE CO., St. Joseph, Mo.
RICHARDS & CONOVER HARDWARE CO., Denver, Colo.
WYETH HARDWARE & MANUFACTURING CO., Council Bluffs, Iowa.
THE GEORGE TRITCH HARDWARE CO., Davenport, Iowa.
SICKELS, PRESTON & NUTTING CO., New Orleans, La.
A. BALDWIN & CO., Limited, Atlanta, Ga.
FITTEN-THOMPSON HARDWARE CO., Nashville, Tenn.
PHILLIPS & BUTTORFF MANUFACTURING CO., Louisville, Ky.
STRATTON & TERSTEGGE, Cincinnati, Ohio.
THE F. H. LAWSON CO., Indianapolis, Ind.
VAN CAMP HARDWARE & IRON CO., Detroit, Mich.
STANDART BROTHERS, Cleveland, Ohio.
THE GEO. WORTHINGTON CO., Pittsburgh, Pa.
THE McINTOSH-HUNTINGTON CO., Buffalo, N. Y.
L. H. SMITH WOODEN WARE CO., Limited, Utica, N. Y.
WALBRIDGE & CO., Elmira, N. Y.
CHARLES MILLAR & SON, Philadelphia, Pa.
BARKER, ROSE & GRAY, New Haven, Conn.
SHIELDS & BROTHER,
C. S. MERSICK & CO.,

For

1895

We respectfully solicit your orders for

Pieced Tin Ware,
Stamped Tin Ware,
Japanned Tin Ware,
Black Sheet Iron Ware,
Galvanized Sheet Iron Ware,
Enameled Ware,

and guarantee satisfaction, both as to quality and prices.

Respectfully,

The Geuder & Paeschke Mfg. Co.

Manufacturers,

St. Paul Ave. and 15th St., Milwaukee, Wis.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

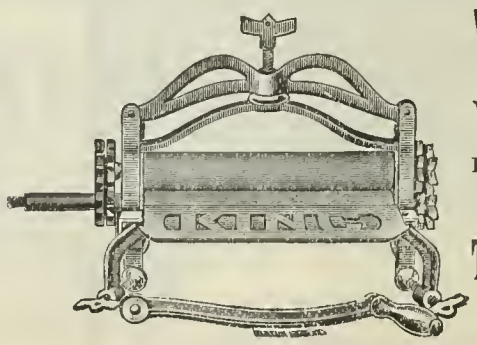
Weight, 16 ounces.
Length, 10 inches.

Can be sold in all seasons.

Write to Manufacturers for Prices.



WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

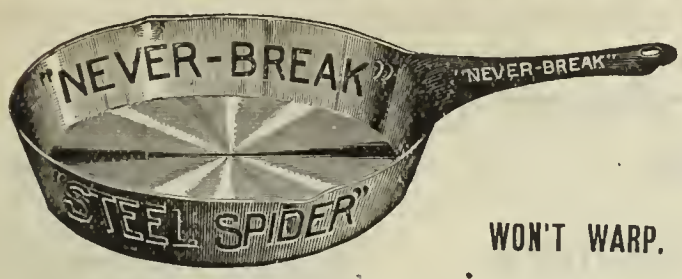
Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

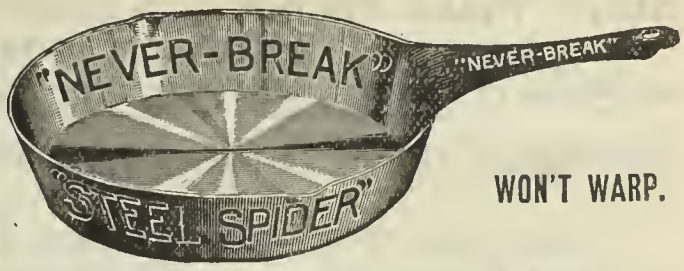
The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.
Boston Office, H. F. Livermore & Co., 34 Oliver St.

"NEVER-BREAK" STEEL HOLLOW WARE



WON'T WARP.



WON'T WARP.

STEEL SPIDERS, GRIDDLES, KETTLES, MASLINS, ETC.

Send for Catalogues of all our lines and Discounts.

THE STANDARD FOR WEIGHT, FINISH AND PRICE.

IMMEDIATE SHIPMENTS GUARANTEED.

The Bronson Supply Co., New York and Cleveland.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware & Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

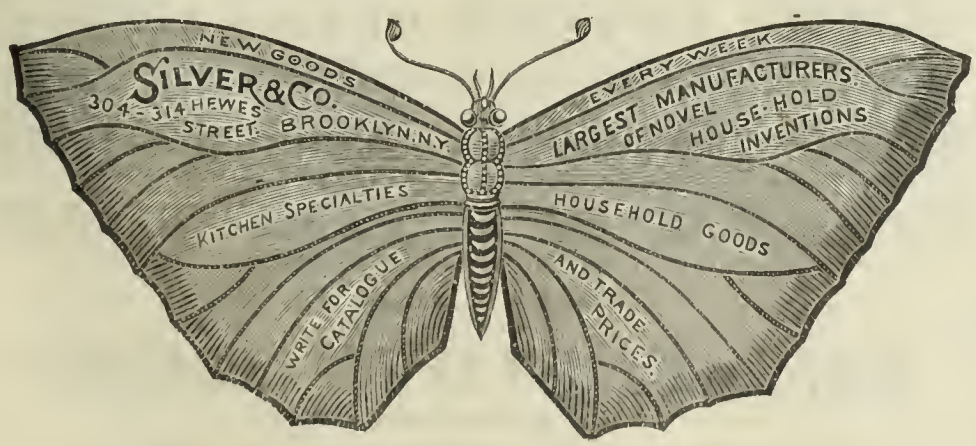
Write us for Catalogue and Prices.



ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.



EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES,

"MARION HARLAND" Tea and Coffee Pots and Urns.

Royal and Crown Roasters and Bakers.

Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses,

Steam Cookers, Milk Sterilizers, Bread and Cake Pans,

Display Stands and Household Novelties.



NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

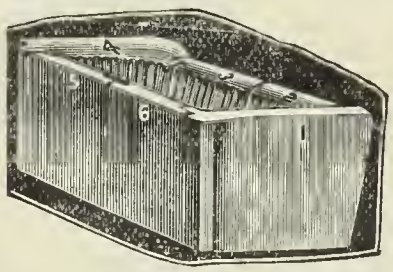
Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

McLEOD & HENRY Co. TROY N.Y.



Stove Linings

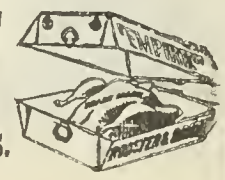
A SPECIALTY.

NEW YORK ELBOW CO.

18 Cliff St., N. Y. City.



Makers of Elbows AND Roasters.



MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of **THE GLOBE VENTILATOR CO.,**

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE CONNECTICUT PLATING CO.,

No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work. Estimates cheerfully submitted.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers original patterns

MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH

WHEN HE SAYS THAT THE

RUTLAND LINING

FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

"FIRESTONE"

Has proved I self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

SELF LUBRICATING

Rotary Screw Ventilators



WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

46 Cortlandt St., New York

☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

315 North 2d St., - - - Philadelphia.

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.

Established 1866.

EDWARD L. CALELY,

STOVE PATTERNS

TO ORDER.

945 Ridge Ave., PHILADELPHIA, PA.

THE TRIUMPH COOKER,

WITH LOCK COVER.

STEAMLESS, ODORLESS AND NON BOIL-OVER.

THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.



A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.

THE HARTFORD HOLLOW WARE COMPANY,

HARTFORD, CONN.

— THE —

KELLY SHOWER BATH RING.

Patent Applied For.



It Will Produce Better Results Than a $100 Shower Bath.

For particulars write

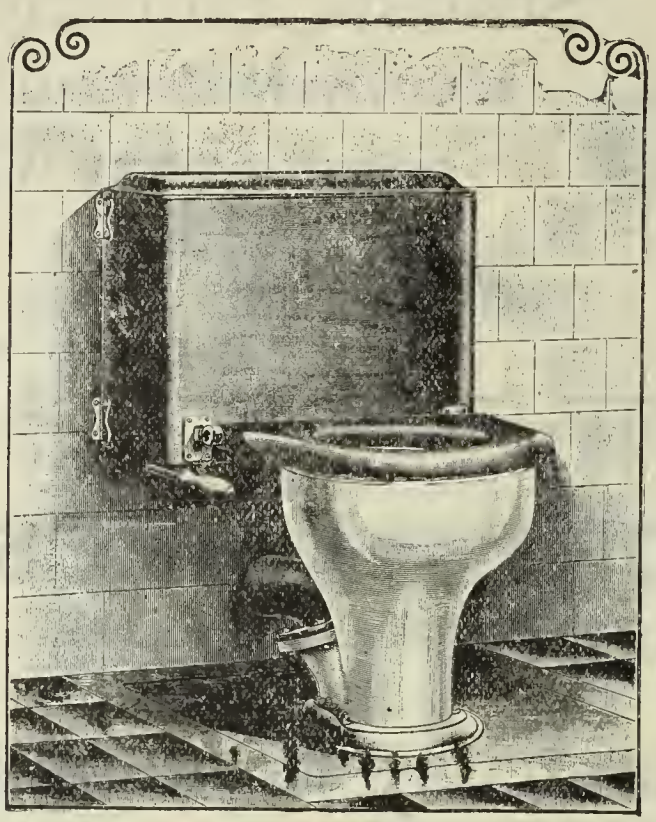
Thos. Kelly & Bros.

Manufacturers of Permanent Plumbing Goods,

124 Franklin St. CHICAGO.

AN IMPORTANT FIXTURE.

A new Water Closet for Hospitals, School Houses and Public or Private Buildings.



THE

Puritan Wash-Down Water Closet.

PATENTED.

WHY THE PURITAN WASH-DOWN IS BETTER THAN ANY OTHER FORM OF CLOSET.

It is simple and compact. The Tank being connected directly to the closet does away with unsightly pipes on the wall and reduces the noise to a minimum, and at the same time being more effective and has a larger surface of water. The joint where the earthenware connects with the soil pipe is under water, which is an absolute safeguard against the leaking of sewer gas. It is especially adapted for fire-proof buildings, and the soil pipe can run on the floor either in front or behind the partition. There is no chance for stoppages and there are no concealed spaces, all parts being accessible.

The body of the closet is made of vitreous or non-absorbing ware and is perfectly sanitary.

GOOD FIXTURES ARE CHEAP, AND POOR FIXTURES ARE EXPENSIVE.

Each Closet is guaranteed for a term of years. Call and see the operation of the Closet at our **SHOW ROOM.**

DALTON-INGERSOLL COMPANY,

169 to 175 High Street, (Fort Hill Square), Boston, Mass.

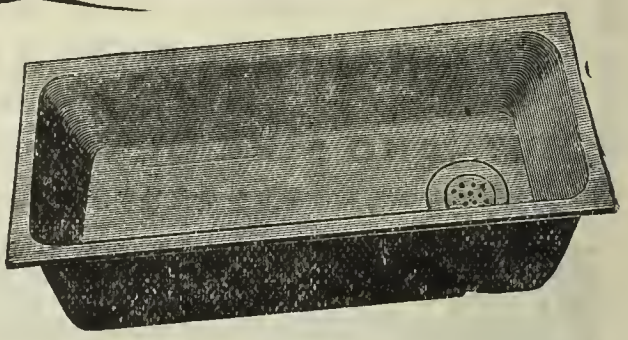
CHICAGO BRANCH : 65 Washington St., Institute of Building Arts.
NEW YORK AGENCY : C. Hoffman, Jr., 277 Pearl St.

Columbus

WROUGHT STEEL SINKS

ARE DRAWN FROM A SINGLE SHEET OF STEEL, AND ARE SUPERIOR TO CAST IRON SINKS IN EVERY PARTICULAR; BEING LIGHTER, STRONGER AND MORE DURABLE. WILL NOT BREAK FROM HEAT, COLD OR ANY CAUSE WHATEVER. BEING LESS POROUS THAN CAST SINKS, ARE COMPARATIVELY ODORLESS, AND THEIR GREAT ELASTICITY AVOIDS THE BREAKAGE OF DISHES.

THE BOTTOM IS FORMED TAPERING TO THE CENTER AND THE OUTLET, SO THAT THE DRAINAGE IS PERFECT, AND ENABLING THE ATTACHMENT OF STRAINER AND PIPE MORE SATISFACTORILY THAN IS POSSIBLE WITH ANY OTHER MAKES.



We Are The Originators

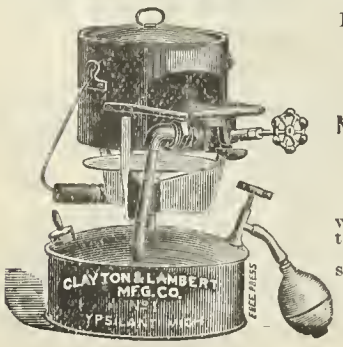
Of the Wrought Steel Sink, and are in position to supply them in any style finish desired, and in many different shapes, at prices that will be named.

THE

Kilbourne & Jacobs Man'fg Co.,

Columbus, Ohio, U. S. A.

Look Here, Tinners, Roofers & Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

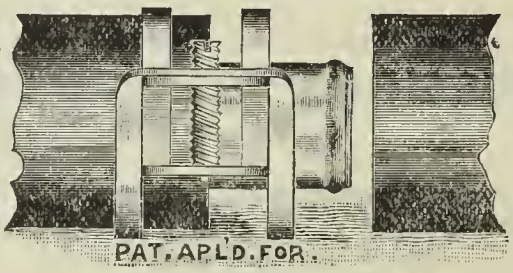
They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.

Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of auy other make a knife and screwdriver being al the tools needed to apply it.



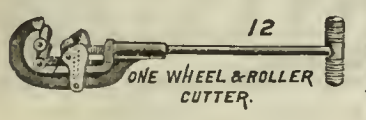
Mender tubes are seamless brass, give full water way, are easily inserted and will not rust. Sold by Jobbers everywhere Write for circuiar and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.

D. SAUNDERS' SONS

MANUFACTURERS OF PATENT



HAND



PIPE



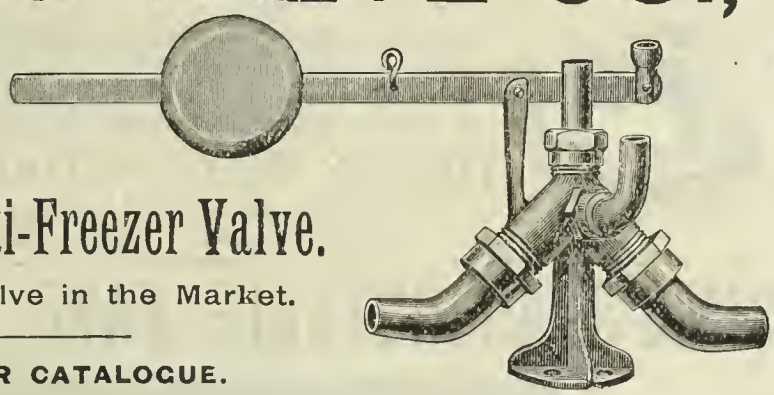
CUTTERS

In three styles. **One Wheel and Roller Cutter. Three Wheeled Cutter** and the **Tool Cutter,** for cutting **Brass, Copper** and Wrought Iron **Tubes.** Also mfrs. of **Pipe** Cutting and Threading **Machines** ¼ in. to 16 in., Hand or Power.

Send for Catalogue to **27 ATHERTON ST., YONKERS N. Y.**

ZERO VALVE CO.,

212 Seneca St.,
BUFFALO,
N. Y.



Vollmer Anti-Freezer Valve.

Cheapest Valve in the Market.

SEND FOR CATALOGUE.

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

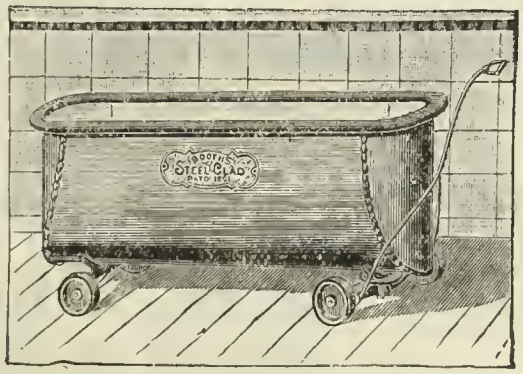
INEXPENSIVE.

It is light, durable, cleanly, low in price, never rusts out, cannot break. Can be decorated to suit individual taste. A boon to country householders, who by its use can enjoy a comfortable bath without expensive piping or the labor of carrying water. There are many styles and sizes of the **Steel Clad Bath,** but only one quality. Don't buy an imitation. Get the **Steel Clad.** All plumbers and jobbers have it, or the

STEEL CLAD BATH CO. OF NEW YORK,
447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,
Detroit, Mich.
GEORGE BOOTH, President.

FOR HOSPITALS AND THE SICK ROOM.



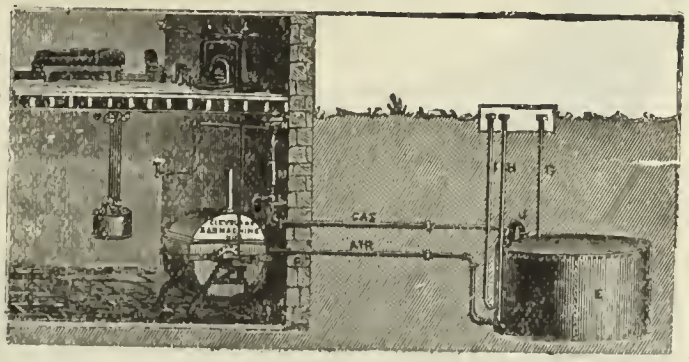
SEND FOR CATALOGUE.

CLEVELAND GAS MACHINE CO.

82 Champlain St., Cleveland, Ohio.

Please send for **Reduced Price** List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engives.



Gray Iron Castings,

Cheap Heating Stoves,
Diamond Thimbles.

S. CHENEY & SON,

MANLIUS, N. Y.

Leather and Rubber WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 39th Street, NEW YORK,

LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order.

BROUGHTON SELF-CLOSING COCKS.

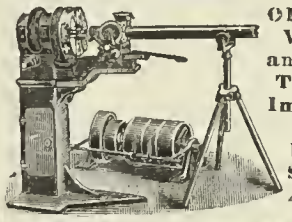


EVERY ONE WARRANTED.

Send for Circular.

E. STEBBINS MF'G CO. Sole Manufacturers.
BRIGHTWOOD, MASS.

PIPE THREADING AND CUTTING OFF MACHINES, WATER, GAS and STEAM FITTERS' TOOLS, Improved Hinged Vises, Pipe Wrenches, Stocks and Dies. *Acknowledged to be the Best.*



ARMSTRONG MFG. CO.,
N. Y. OFFICE: 139 Centre St. — Bridgeport, Conn.

DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.

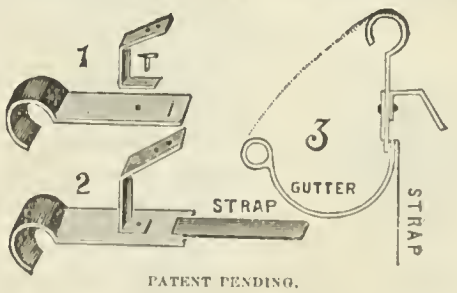


The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discounts

MADE BY
THE DAY MFG. CO.
Detroit, Mich., U. S. A.

STRAP E. T. HANGER.



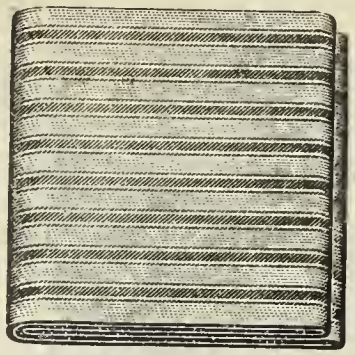
PATENT PENDING.

TINNER, ATTENTION!

Save the narrow strips of Galvanized Iron and Tin that you have been taking to the Dump, for the **Strap Hanger.** Any wide-awake TINNER can see at a glance the saving. Cut No. 1 shows Hanger as they are packed—Gross in a Box. **$2.50 per Gross,** freight allowed.

Discount to the Trade.

MANUFACTURED BY
JOHN SEVERDING, - Richmond, Ind.



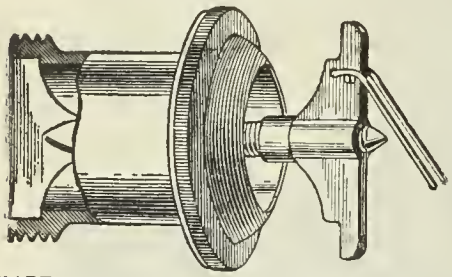
"Columbia" Wiping Cloths FREE!

Not free exactly from a financial standpoint (altho' very near it), but free from all defects due to **a Poor Quality of Ticking, Carelessness in Making and a Bungling Manner of Fastening the Ends.** A cloth free from the above defects is well worth the price we ask, 12 cents each, or six for 70 cents. Remember we make any kind—send us the size you want, giving the wiping edge first.

THE J. W. CHAMBERLAIN CO.,
Plumbing & Steam Fitting Specialties,
BANGOR, MAINE.

CLOSET REPAIR COUPLING.

(Patent applied for.)



MADE in two styles, to suit iron and lead pipe.
TAKES the place of the old spud and necessitates no change in fixtures.

MANUFACTURED ONLY BY
SAVILL, WALLS & CO.,
Mfrs. of Plumbers' Supplies,
229 Budden Street - - - PHILADELPHIA.

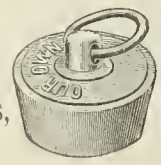


USE "OUR OWN" BASIN PLUGS.
NO OTHER LETTERING ON THEM.

SAMPLE DOZEN ASSORTED $1.

Best Quality. Handsomely Nickeled.

H. O. CANFIELD,
MANUFACTURER OF
Moulded Rubber Goods,
BRIDGEPORT, CONN.



Don't Buy

*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

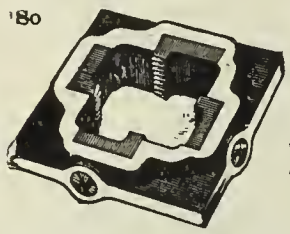
A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;

Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**

Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence** of quality.

If by chance you do not think these points, or the saving of money, objectionable,



Send us a **Postal Note for 62 Cents** (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, PA., U. S. A.
SEND FOR CATALOGUE OF THE "SKELETON" PIPE DIE

SIMS'S ADJUSTABLE EAVE TROUGH.



Pat. Jan. 14th, 1890.

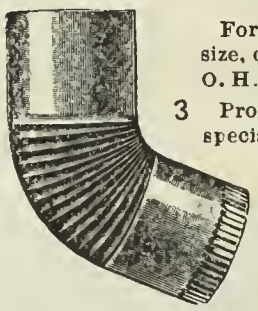
Various Designs of Galvanized Sheet Steel Eave Troughs, Mitres, and Ridge Rolls, Roof Gutters, Expanding Conductors, Elbows, etc., etc.

THE SIMS MFG. CO. Sole Manufacturers, **NEWARK, OHIO.**

The "O. H." One Piece PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

(PATENTED OCT. 25, 1892.)



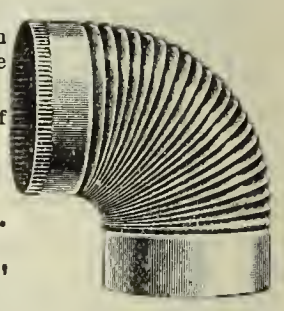
For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.

For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,
WAVERLY, N. Y



Covert Pants Stretcher.



Before. After.

THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

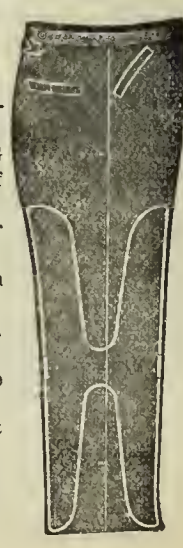
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

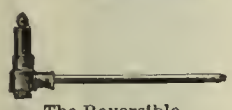
MANUFACTURED ONLY BY

COVERT MFG CO., West Troy, N. Y.





The Curtis Pipe Vise.



The Reversible Ratchet Drill.

CURTIS & CURTIS,

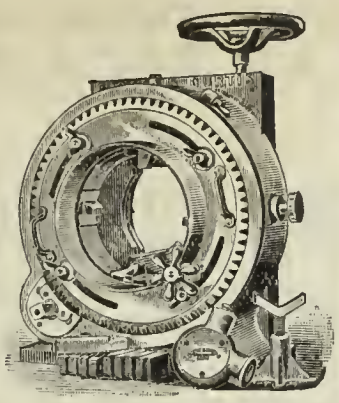
56 Garden St., Bridgeport, Conn.

We make a specialty of manufacturing all kinds of

TOOLS or MACHINERY

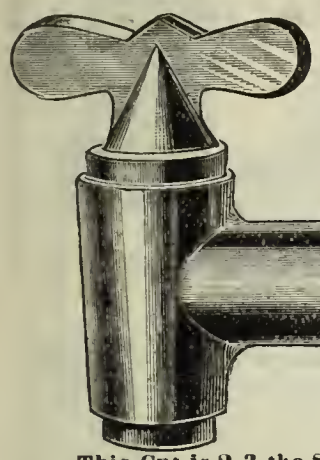
Used in Working Wrought Iron Pipe.

Send for new 52-page Illustrated Catalogue.



The Forbes Patent Die Stock.





This Cut is 2-3 the Size of Faucet.

CLARK'S NEW FAUCET

— FOR —

MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.



GUM A RUBBER,

Or

RUBBER GUM,

Or

Elastic Cement.

No matter what you call it,

IT'S A DANDY.

Just what you want to make a pipe joint tight. It discounts

WAX, RED LEAD, BLACK LEAD.

Holds the mercury sky high on a test job.

BAILEY-FARRELL MFG. CO.,

PITTSBURGH.

W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON

156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS

TRADE MARK.

REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

A complete outfit. Easy to putup, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS

Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE,** will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO., ASHLAND, O.

GREATEST IMPROVEMENT OF THE AGE.

PECK BROS. & CO.,

Fine Sanitary Goods.

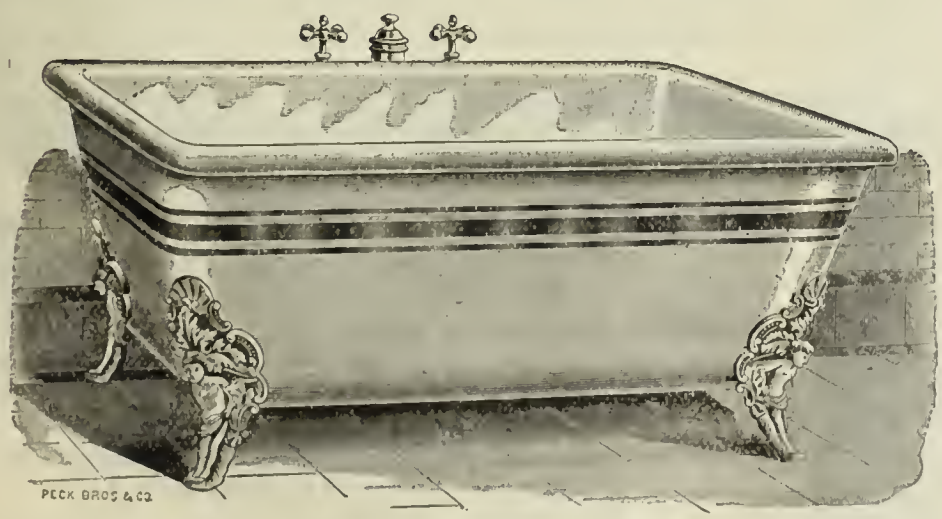
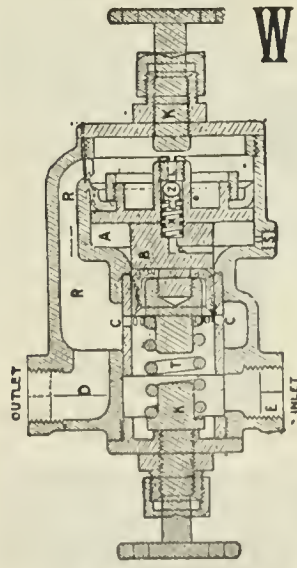


Fig. 198, Catalogue of 1893.

47 Cliff St, NEW YORK. 259 Wabash Ave., CHICAGO. 127 Chestnut St., NEW HAVEN, CT. 65 Oliver St., BOSTON.



W. G. Taafel's Pressure Regulator.

Send for Price-List.

NEWARK REGULATOR COMPANY

Newark, Ohio.



CHUCKS The National

All sizes and styles. Patented

Reversible Jaws. Illus. catalogue

The standard Chuck since 1882.

Address W. WHITLOCK,

39 Cortlandt Street, New York.



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



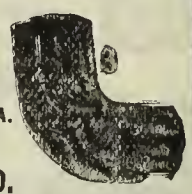
W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.





THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade,
Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

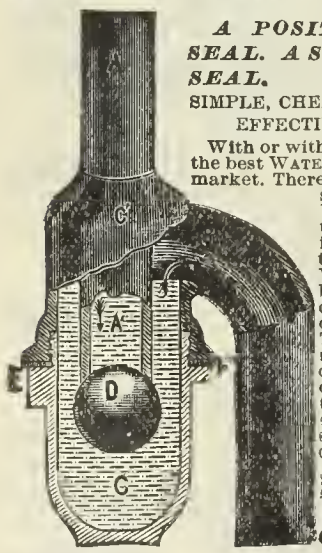
6-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.

THE BOWER

SEWER GAS TRAP.



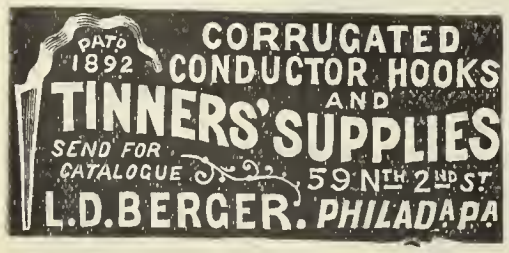
A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

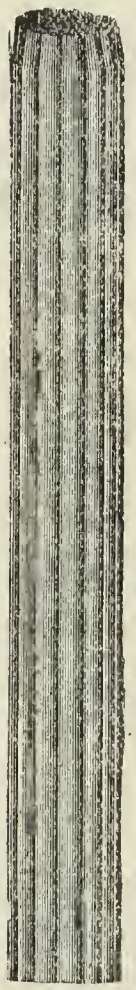
SIMPLE, CHEAP.

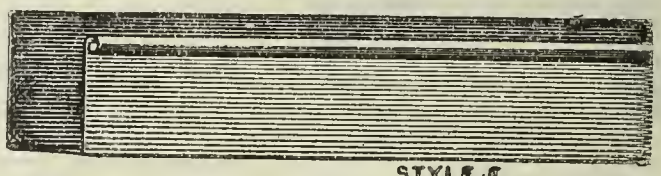
EFFECTIVE and DURABLE.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative anddescriptive 48-page pamphlet sent free on application.

B. P. BOWER & CO.
Manufacturers,
Cleveland, Ohio







Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

PLECKER'S

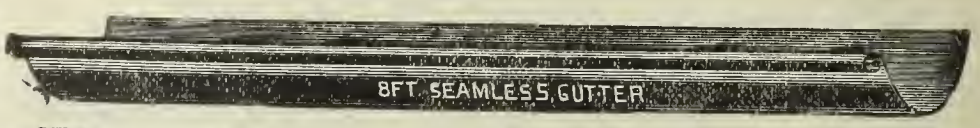
Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

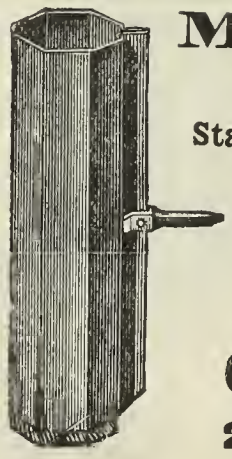
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,

(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.

BOWERS ROOFING AND METAL WORKS.



Standing Seam and Roll Roofing.

Painted Steel, Terne and Galvanized.

—MANUFACTURED BY—

L. M. BOWERS & CO., Binghamton, N. Y.

EAVE TROUGH CONDUCTOR Pipe.

THE KANNEBERG ROOFING CO.,
CANTON, OHIO, U. S. A.

MANUFACTURERS OF

Patent Eave Trough and Hangers, Conductor Pipe, O. G. and Box Gutters, Ridge Roll and Capping, Ventilators, Finials, Cresting.

Patent Steel Roofing,* Metallic Shingles, Crimped, Beaded and Corrugated Steel, Steel Weather-Boarding, Sheet Steel Pressed Brick, Mixed Roof Paint, Building Paper, etc.†

* Write for sample.

† Get Illustrated Catalog.

Corrugated Expanding Conductor

OF GALVANIZED IRON AND COLD ROLLED COPPER.



JAMES A. MILLER & BRO.,

129 and 131 South Clinton St.,

CHICAGO.



BERGER BROS.,

TINNERS' HARDWARE, ROOFERS' SUPPLIES,

231 AND 237 ARCH STREET, PHILADELPHIA.

GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,

LARGEST STOCK, GREATEST VARIETY, PROMPT SHIPMENTS.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Hods, Elbows, Ears, Handles, Valves and Plungers, etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.

MAPLE SYRUP CAN and SAP BUCKET STOCK

We are now prepared to quote and ship promptly. Get our prices before buying.

J. M. & L. A. OSBORN, - - - CLEVELAND, O.

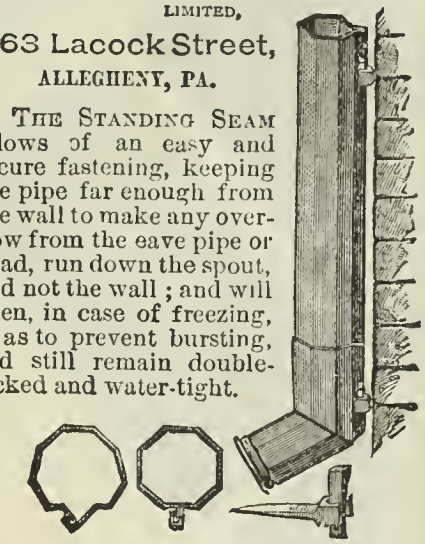
THE IRWIN & REBER
PATENT

EXPANDING WATER CONDUCTOR.

MANUFACTURED BY THE

S. S. S. Conductor Co.
LIMITED,

163 Lacock Street,
ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.

The Climax Ratchet Stock



Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, $10.00

No. 2 threads 1 to 2 in. pipe, takes 2½, 3 and 4 in. die, $17.00

For sale by leading jobbers.

Manufactured Solely By

C. M. KEMP MFG. CO.,
Baltimore.

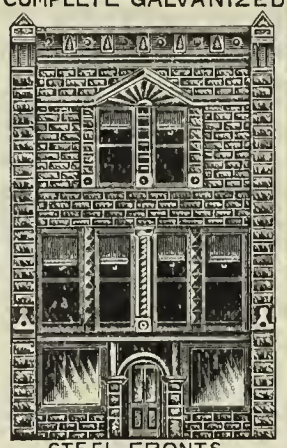
— HER SORROW.—He: "Young Plugleigh is going to the dogs fast."
She: "I'm sorry for the dogs."

PATENTED

LONGEST EAVE TROUGH IN THE WORLD 10 FT WITHOUT A SEAM

PRESSED STEEL BRICK

COMPLETE GALVANIZED



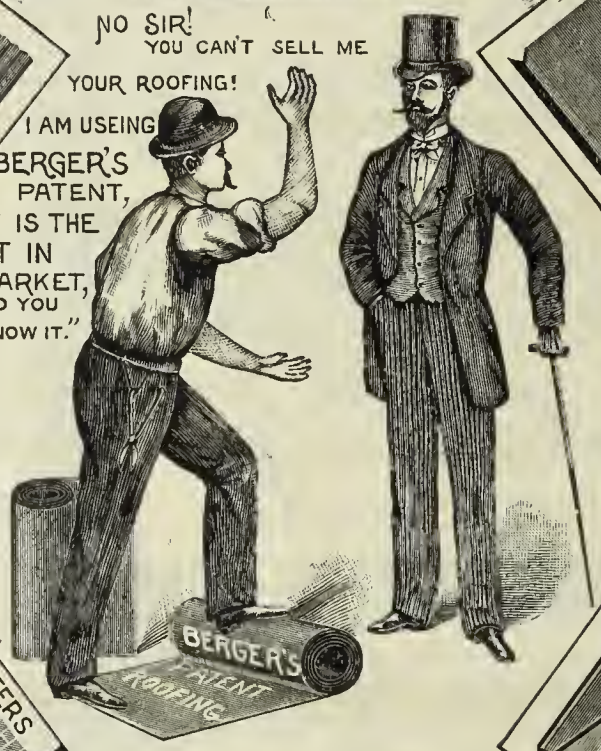
STEEL FRONTS

ROCK FACE BRICK AND STONE

CONDUCTOR

CORRUGATED IRON

NO SIR! YOU CAN'T SELL ME YOUR ROOFING! I AM USEING BERGER'S PATENT, IT IS THE BEST IN THE MARKET, AND YOU KNOW IT."



CRIMPED IRON

PLAIN ROUND

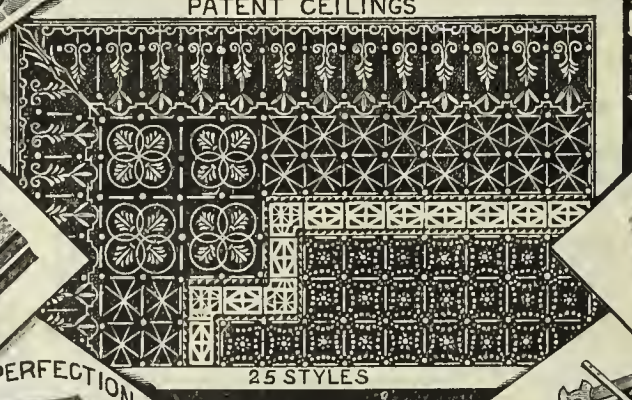
FIRE PROOF DOORS & SHUTTERS

METALLIC SHINGLES

CONDUCTOR

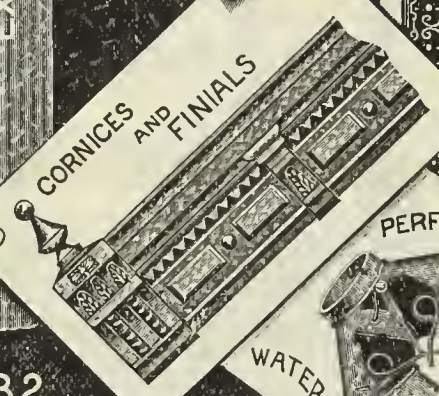
EXPANDING

PATENT CEILINGS

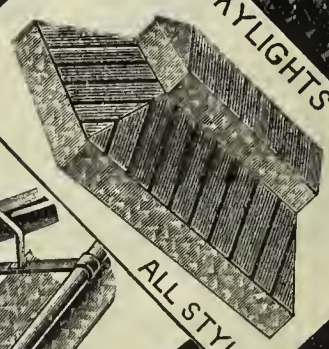


25 STYLES

CORNICES AND FINIALS

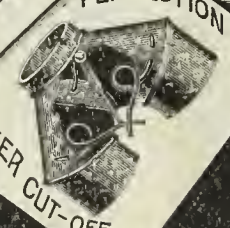


SKYLIGHTS

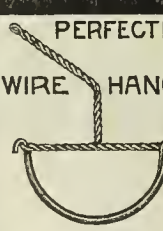


ALL STYLES

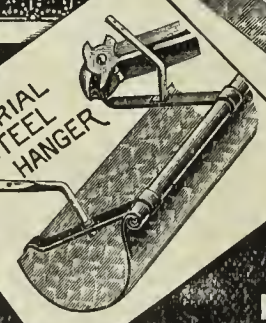
PERFECTION WATER CUT-OFF



PERFECTION WIRE HANGER



IMPERIAL STEEL HANGER



132 PAGE Catalogue ON APPLICATION.

WRITE FOR PRICES IT WILL PAY YOU.

THE BERGER MFG. CO. CANTON, O.

IRON AWNINGS, ROOF PAINTS,
WEATHER VANES, VENTILATORS, MALLEABLE IRON
CRESTINGS, etc.

WESTERN AGENTS: ILLINOIS ROOFING & SUPPLY CO. CHICAGO, ILL.

Gummey's Anti Pin Hole Bright Tin Plate.

By permission of Messrs. Fieber & Holmes, Brookville, Indiana, we insert the following testimonial:

BROOKVILLE, IND., FEB. 1, 1895.

Messrs. GUMMEY, SPERING & Co.,
Philadelphia.

GENTLEMEN:

We have some Coffee Pots and Boilers made from your Anti Pin Hole Tin which have been in use over a year and only one of them ever came back for repairs. In this one case it had a flat copper bottom, and the *bottom* was worn out. We carefully examined the tin on the inside and could not see that it was eaten a particle This Boiler was a very large one for the County Poor Asylum.

Yours truly,

(Signed) FIEBER & HOLMES.

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. **BRIDGEPORT, OHIO.**

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,
535 to 547 West 15th Street, New York.

NEW CASTLE

AMERICAN BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

New Castle Steel and Tin Plate Co., New Castle, Pa.

NOTICE.

It has come to my knowledge that certain parties are offering an exact duplicate of our Phillips-Newbold Tinning Machine, including our Flue arrangements, both of which are protected by patents, and hereby give notice that any user of such Pots and Machines will be held responsible for damages, without reference to the builders thereof.

I have this month sold nine of our Phillips-Newbold Machines to run on special work where other pots are being run on such work as they are adapted for. (Signed) F. R. PHILLIPS, Philadelphia, Pa.

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

FOLLANSBEE BROTHERS COMPANY,

Successors to

James B. Scott & Co,

Manufacturers of the well and favorably known "**Scott's Extra Coated**" guaranteed Roofing Tin. **Trade-Mark Registered.**

The officers of this Company are the surviving members of the old firm, and the management, manufacture and inspection of each plate are in charge of the same individuals as heretofore.

Also sole factors

Blairsville Rolling Mill and Tin Plate Co.,

Manufacturers

Black Plate, Tin Plate, Terne Plate.

Offices and Warehouses, 122 and 124 Second Ave.,

PITTSBURGH, PA.

BEWARE OF IMITATIONS.

"BREVITY" MAY BE "THE SOUL OF WIT"—

But short pieces of tin do not make "TANDEM" CONTINUOUS ROOFING....

CUSTOMERS are told what to expect—and get it. In "TANDEM" they get a roll of good, prime tin, made of sheets 96 in. long, furnished either 14 in., 20 in. or 28 in. wide; and, if desired, THOROUGHLY WELL PAINTED.....

"TANDEM" is put on the market under no false pretenses. It is not a light weight tin; it is not made from 14 x 20 in. or 20 x 28 in. sheets—and IS NOT SOLDERED BY HAND.....

"TANDEM" Continuous Roofing Tin is made in IC and IX thicknesses. Primes and Wasters are sold separately. Before buying continuous roofing tin, be sure of what is being offered you in competition with "TANDEM".....

MERCHANT & CO., Inc.,

PHILADELPHIA, NEW YORK, CHICAGO, BROOKLYN, LONDON.

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

TRADE MARK AMERICAN RG CLEANED.

THE CAMBRIDGE IRON & STEEL CO.

MANUFACTURERS OF

GALVANIZED SHEET IRON

CAMBRIDGE C I&S CO BEST TRADE MARK

BLACK SHEETS FOR ROOFING & CORRUGATING

PICKLED & COLD ROLLED FOR STAMPING

CAPACITY: RANGES FROM No 30 26 INCHES WIDE TO 1<4×40×120

CORRESPONDENCE SOLICITED

OFFICE & WORKS CAMBRIDGE, OHIO.

ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of 40 LBS. per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

Standard Books
—ON—
FOUNDRY PRACTICE

The Encyclopedia of Founding and Dictionary of Foundry Terms,

used in the practice of molding. Together with a description of the tools, mechanical appliances, materials, and methods employed to produce castings in all the useful metals and their alloys, including brass, bronze, steel, bell, iron and type founding, with many original mixtures of recognized value in the mechanic arts. Also aluminum, plating, gilding, silvering, dipping, lacquering, staining, bronzing, tinning, galvanizing, britannia-ware, German silver, nickel, soldering, brazing, ores, smelting, refining, assaying, etc. By SIMPSON BOLLAND, Author of "The Iron Founder," "The Iron Founder" Supplement. 12mo.: cloth..... .....$3.00

The Pattern Maker's Assistant

Embracing lathe work, branch work, core work, sweep work and practical gear constructions, the preparation and use of tools, together with a large collection of useful and valuable tables. Sixth edition. By JOSHUA ROSE, M. E.; illustrated with 250 engravings; 324 pages: cloth.....$2.50

Modern Molding and Pattern Making.

A practical treatise upon pattern shop and foundry work. By JOSEPH P. MULLIN, M.E.: 257 pages; cloth; illustrated. $2.50

Iron and Steel Founding.

Illustrated with 39 diagrams. By C. WYLIE. Second edition, revised and enlarged; 324 pages; 8vo; cloth... .....$2

The Practical Brass and Iron Founder's Guide.

A treatise on brass founding, molding, the metals and their alloys, etc. By JAMES LARKIN, late conductor of the brass foundry department in the Penn Works, Philadelphia. A new revised and greatly enlarged edition. Contents: Among the most important and entirely new sections of this edition of this valuable and popular book are the following: Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to Other Metals; Casting Iron and Other Metals Upon Lace, Emboroideries, Fern Leaves and Other Combustible Materials; Some Modern Bronzes. In one volume; 12mo; 400 pages.....$2.50

American Foundry Practice.

Treating of loam, dry sand and green sand molding, and containing a practical treatise upon the management of cupolas and the melting of iron. By THOMAS D. WEST, practical iron molder and foundry foreman. Fully illustrated. Eighth edition, revised. 408 pages; cloth.....$2.50

The Iron Founder.

A comprehensive treatise on the art of molding, including chapters on core-making, loam, dry sand and green sand molding, also crystallization, shrinkage and contraction of cast iron and a full explanation of the science of pressures in molds, added to which are formulas for mixtures of iron, tables, rules and miscellaneous information. By SIMPSON BOLLAND. Illustrated with over 300 engravings. 12mo, cloth....$2.50

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings, wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. Illustrated with over 200 engravings; 400 pages; 12mo; cloth..... ...$2.50

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96-102 Reade St., New York.

Bright Charcoal Tin Plates.

Coke Tin Plates.

A Full Assortment of Sizes.

ALSO

20 x 28 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.		
IC	CLYRO—Old Way, Stamped and Squared.		
IC	M F Stamped and Squared.		
IC	PONTYMISTER—Old Style, Stamped and Squared.		
IC	KILLEY—Extra Coated, Stamped and Squared.		
IC	L P L—Extra Coated, Stamped and Squared.		
IC	LILY—Stamped and Squared.		
IC	DYFFRYN,	200 lbs.	PETREL.
IC	WORCESTER.	IC	ALYN.
200 lbs.	WORCESTER.	IC	BAAN.
IC	W T R—Stamped.	IC	MANSEL.
200 lbs.	W T R.	IC	ALBAN.
IC	P T L.	200 lbs.	ALBAN.
IC	DEAN	190 lbs.	ALBAN.
200 lbs.	DEAN.	200 lbs.	CAWDOR.
IC	PETREL.	190 lbs.	CAWDOR.

14 x 20 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F—Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	W T R—Stamped.
100 lbs.	W T R.
IC	P T L.
IC	DEAN.
100 lbs.	DEAN.
IC	PETREL.
100 lbs.	PETREL.
100 lbs.	CAWDOR.
IC	BAAN.

WASTER ROOFING.

ICW	20x28	GWERNEN.	
ICW	"	W T R.	
200 lbs. W	"	ALBAN.	
190 lbs. W	"	ALBAN.	
180 lbs. W	"	DYFFRYN.	

SOLDER—The reduction in Pig Tin has made prices much lower.

RUSSIA SHEET IRON (Genuine)—The duty has been reduced, and prices are lower than last year. No. 8 to No. 16 inclusive, sheets 28x56 inches.

BRUCE & COOK,

190 Water St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. Brooklyn, N. Y.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURERS OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty*

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

Buy Plain and Corrugated Conductors and Single and Double Beaded Eave Troughs, all in 10 ft. lengths; also Brick Siding, Corrugated Roofing, Cornices, &c., of

ALLEN'S CORRUGATING WORKS,

422 and 424 W. Randolph St., CHICAGO, ILL.

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

—MANUFACTURERS OF—

SHEET METAL ROOFING, SIDING AND CEILING

—OF ALL DESCRIPTIONS FROM—

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.

Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.

Factory, 113 to 133 Soulard Street, ST. LOUIS, MO.

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96 102 Reade St., New York.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.

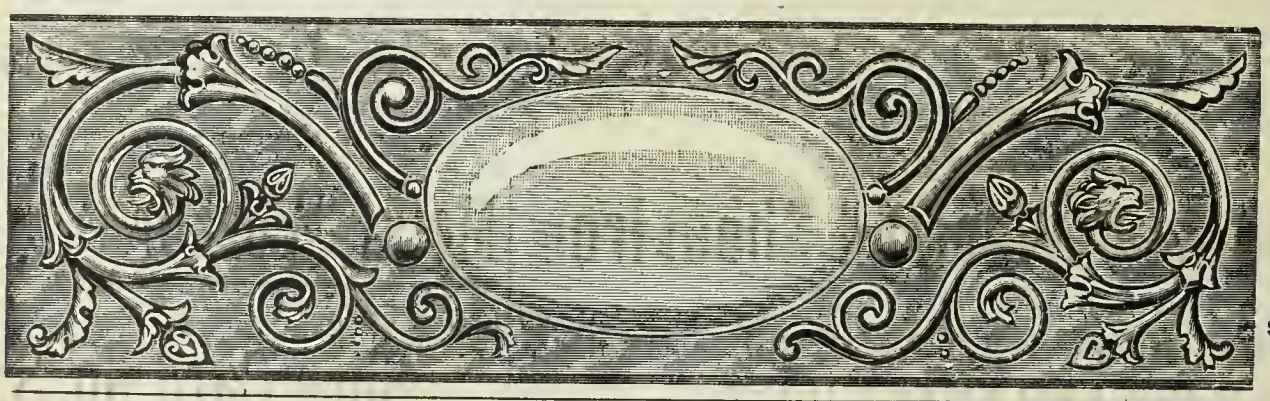
AMERICAN ROOFING CO.,

ST. LOUIS and CINCINNATI.

Mention this paper.



FRIEDLEY & VOSHARDT, 194 & 196 Mather Street, CHICAGO, ILL.



MANUFACTURERS OF
Sheet Metal, Zinc and Copper Ornaments
FOR
Interior and Exterior Work, Steel Ceilings, Statuary, &c.
Send for Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.

James A. Miller & Bro.,

129 and 131 South Clinton St.,
CHICAGO,

MANUFACTURERS



FOR

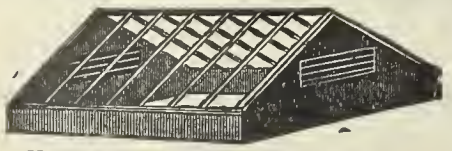
ROOFING AND SIDING.

Send for Circular and Prices.

HOLTON IRON ROOFING

ROOFING, SIDING, CEILING &c.
NEW LISBON, O.
AGENTS WANTED EVERYWHERE

RASNER & DINGER



Manufacturers of HAYES' PATENT

Metallic Sky-Lights,

Galvanized Iron Cornices and all kinds of Architectural Sheet Metal Work, Tin and Iron Roofers.

Second Ave. & Ferry St., Pittsburgh, Pa

BEWARE! OF INFRINGMENTS.

Purchase only the
Genuine Pressed Steel Brick.



FOR Catalogue Samples and Prices. THE PENN IRON ROOFING AND CORRUGATING Co LIMITED. 23rd & HAMILTON Sts PHIL'A, PA. U.S.A.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size. CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. LITTLEFORD BROS., SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

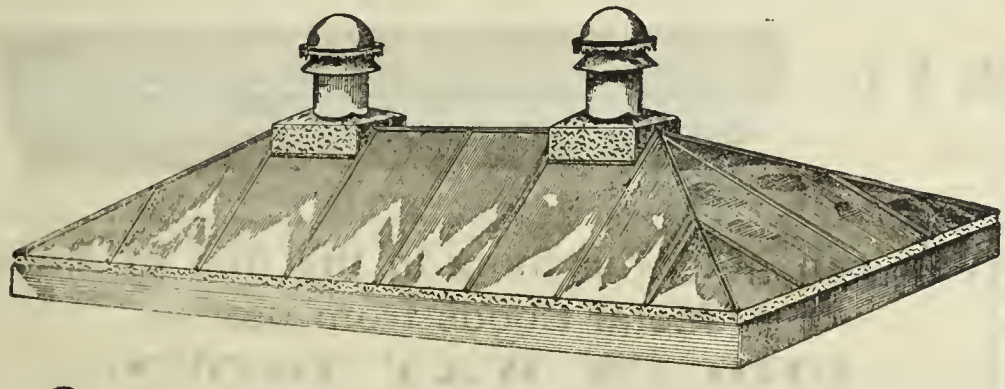
Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.





Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.



WORLD'S FAIR AWARD

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

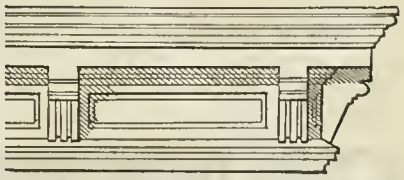
SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

JAMES A. MILLER & BRO.,

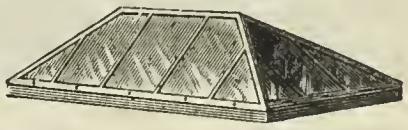
129 and 131 S. Clinton St., Chicago,

MANUFACTURERS

Galvanized Iron Cornices and Window Caps.



SHEET METAL SKYLIGHTS



Owing to increased facilities (secured to enable us to fill our World's Fair contracts), we can make specially low prices on Skylights.

CORRUGATED { *Iron Roofing.* / *Conductor Pipes.*

See other Advertisement in this Paper.

CORTRIGHT METAL SLATES and VICTORIA SHINGLES



Made of TINPLATE, (Full Weight Only)

Galvanized Steel and COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office, 134 Van Buren Street, Chicago.

Defy Fire and Time

WITH OUR

Steel Roofing,
Steel Ceilings, (Patented)
Corrugated Iron, Conductor Pipes,
Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,

Office and Works, Wheeling, W. Va.
Office and Warehouse, 474 Laflin St., Chicago.
Office and Warehouse, 81 Fulton St., New York.

DUGAN'S PATENT

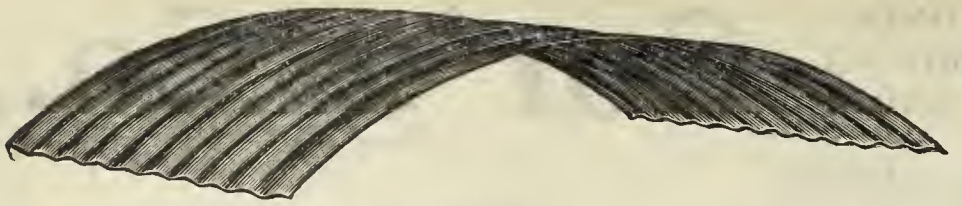
SNOW GUARDS FOR SLATE AND OTHER ROOFS

SEND FOR ILLUSTRATED CIRCULAR & PRICE LIST

M. HALLIDAY,

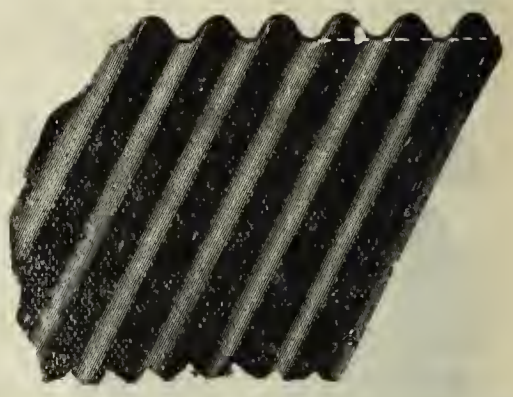
SOLE PROPRIETOR AND MANUFACTURER.

218 EAST NINTH STREET, NEW YORK.



Curved and Corrugated

Sheets for Structural Purposes



Any size and dimension, ready for placing in position without trimming. Lightness, strength and durability insured at a minimum cost.

Such as Houses, Barns, Factories, Warehouses, Granaries, Sheds, Etc.

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.

The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S.

FIRST & WASHINGTON STS. JERSEY CITY, N.J.

EAVE TROUGH

and Conductor Pipe made of the best material under new processes. Cheaper ! better ! and easier to handle than any other. Get our Catalogue, our Prices, and make a profit on this branch of your business.

FINIALS,
ELBOWS
HANGERS,
CRESTINGS,
IRON ROOFING,
STEEL ROOFING,
ROOFERS' SUPPLIES.

Rhodes, Dickelman & Co.,

FOREST, O.





You can get everything in the line of Sheet Metal Goods from us.

PRICES WAY DOWN.

Steel Roofing, Corrugated Iron.

Galvanized Steel Eave Trough, Corrugated Expanding Conductor, Galvanized Cornice, Ornamental Crestings, Finials, Etc.

DOWN! DOWN! GO PRICES. WRITE US QUICK.

J. H. ELLER & CO., Office, 194 E. Fifth St., CANTON, OHIO.

IRON ROOF CRESTING.

Full line of new and desirable designs.

S. GREEN & SONS, **Des Moines, Ia.**

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade:

TIN AND IRON SHOW CARDS.

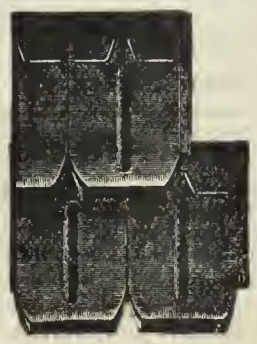
110 John St., - New York.

THORN'S PATENT METALLIC ROOFING

TILES AND SPRING-LOCK SHINGLES.

THE BEST, MOST HANDSOME, DURABLE AND SECURE ROOFING PLATES YET OFFERED TO THE BUILDING TRADE.

Indorsed by All the Leading Architects.



Our system differs from all others in existence. We keep a complete stock of *eight designs of tile and two sizes of shingles.* Our tiles are a marvel of beauty and have the most secure and most practical side-lock ever invented.

Send for illustrated catalogue and circular.

THORN SHINGLE & ORNAMENT CO.,

1221 Callowhill St., Philadelphia, Pa.

Architectural
Sheet Metal
Work.

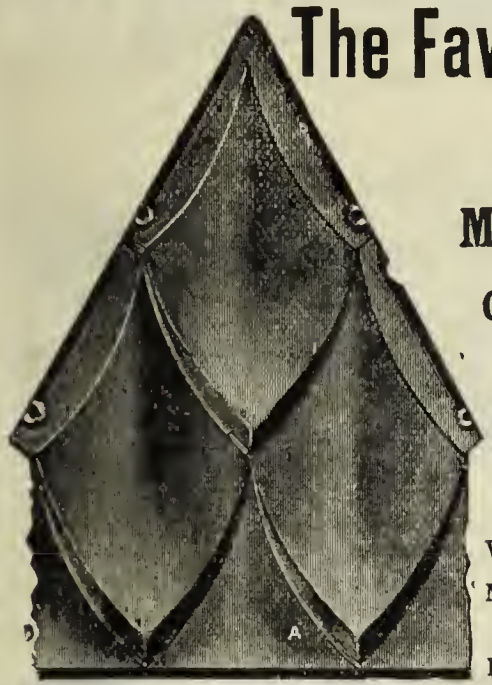
Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.



The Favorite Metal Shingle

EASTLAKE.

MONTROSS PATENT.

GOTHIC and DIAMOND TILE.

Unequaled for Beauty and Excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit, Mich.
MONTROSS METAL SHINGLE CO., Camden, N. J.
E. VAN NOORDEN & CO., Boston, Mass

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING & SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC.

QUARRIES, BANGOR, PA.
NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE Kitchen Sinks, Laundry Tubs, Washstand Tops, Marbleized Shelves, Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also Mantels.

FAIRHAVEN, VERMONT.

SEND FOR CATALOGUE.

At this time of the Year

metal workers are busy fixing furnaces, steam pipes, etc. Dixon's Graphite Pipe Joint Grease will make a better joint than red or white lead and parts can be separated easily even years after. When used on valves it does not harden or cause the valves to stick. Send for circular and sample.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

THE ROOT & BARRON ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer,
PALMYRA, NEW YORK.

SALEM NAIL CO.

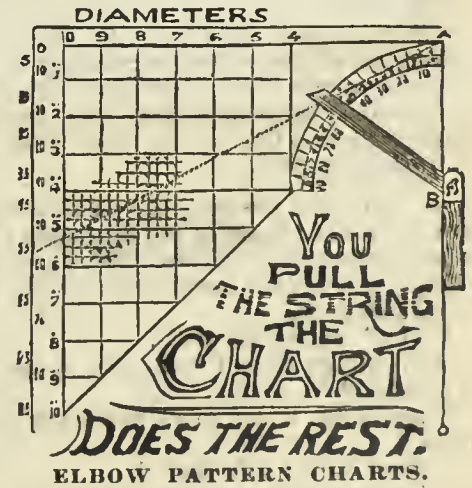
O. Nelson, 292 Pearl St., New York.

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds.



ELBOW PATTERN CHARTS.

Quick method. Easy to learn. Good to have. Over 1000 sold. 50c. by mail.

A. L. BURTIS, Lockport, N. Y.

JOHN SANBORN,
Dealer in Metals,
and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 WATER STREET,
Beekman Street, NEW YORK.



The Smallest Electric Battery in the World.

In contrast to the very large generators of electricity—batteries and dynamo electric machinery—in such common use today, it may be interesting to note what is perhaps the smallest electric battery ever constructed and no doubt also the smallest generator of electrical or mechanicnl energy. Thls battery was constructed some years ago, says the *Manufacturer and Builder*, by one of the electricians of the Boston Telephone Company, and consisted of an ordinary glass bead, through which two wires, one of copper and the other of iron, were looped and twisted so as to prevent their coming in contract. The wires acted as the electrodes, and all that was necessary to cause a current to flow was to place a drop of acidulated water in the bead. Certainly such a minute battery furnished but an infinitesimal current, but could be easily used in a delicate telephone; in fact it is said to have actually been used in signaling to a distance of nearly 200 miles.

— QUALIFIED.—(Public School, First Grade, A. D. 1905.) Teacher (to applicant for admission): Johnnie, have you got a certificate of vaccination for smallpox ?"

"Yes, sir."

"Have you been inoculated for croup ?"

"Yes, sir."

"Been treated with diphtheria serum ?"

"Yes, sir."

"Had your arm scratched with cholera bacilli ?"

"Yes, sir."

"Have you a written guarantee that you are proof against whooping cough, measles, mumps, scarlet fever and old age ?"

"Yes, sir."

"Have you your own private drinking cup ?"

"Yes, sir."

"Do you promise not to exchange sponges with the boy next to you and never use any but your own pencil ?"

"Yes, sir."

"Will you agree to have your books fumigated with sulphur and sprinkle your clothes with chloride of lime once a week ?"

"Yes, sir."

"Johnnie, you have met the first requirements of the modern sanitarians and may now climb over yonder rail, occupy an isolated aluminum seat and begin making P's and Q's as your first lesson." —*Washington Star.*

— "ARE you the man who painted that 'ere picture of 'Moses in the Bulrushes ?'" asked a countryman of an artist who had recently startled the town by an exhibition of oil paintings.

"Yes," replied the artist.

"All right; then I want you to paint my father."

"Certainly, if he gives me a few sittings."

"Can't do it ; he's dead."

"Let me have a photograph of him."

"Can't do that, neither; he never had his picture taken."

"I am afraid, then, I must decline."

"Decline ! What for? Haven't you painted Moses ? You didn't have a photograph of him, did you? No, I thought not. Well, my father hain't been dead nearly so long as Moses. If you can paint Moses, you ought to know enough to paint my father."

Appreciating the situation, the artist went to work and evolved such a portrait as he thought might satisfy so original a son.

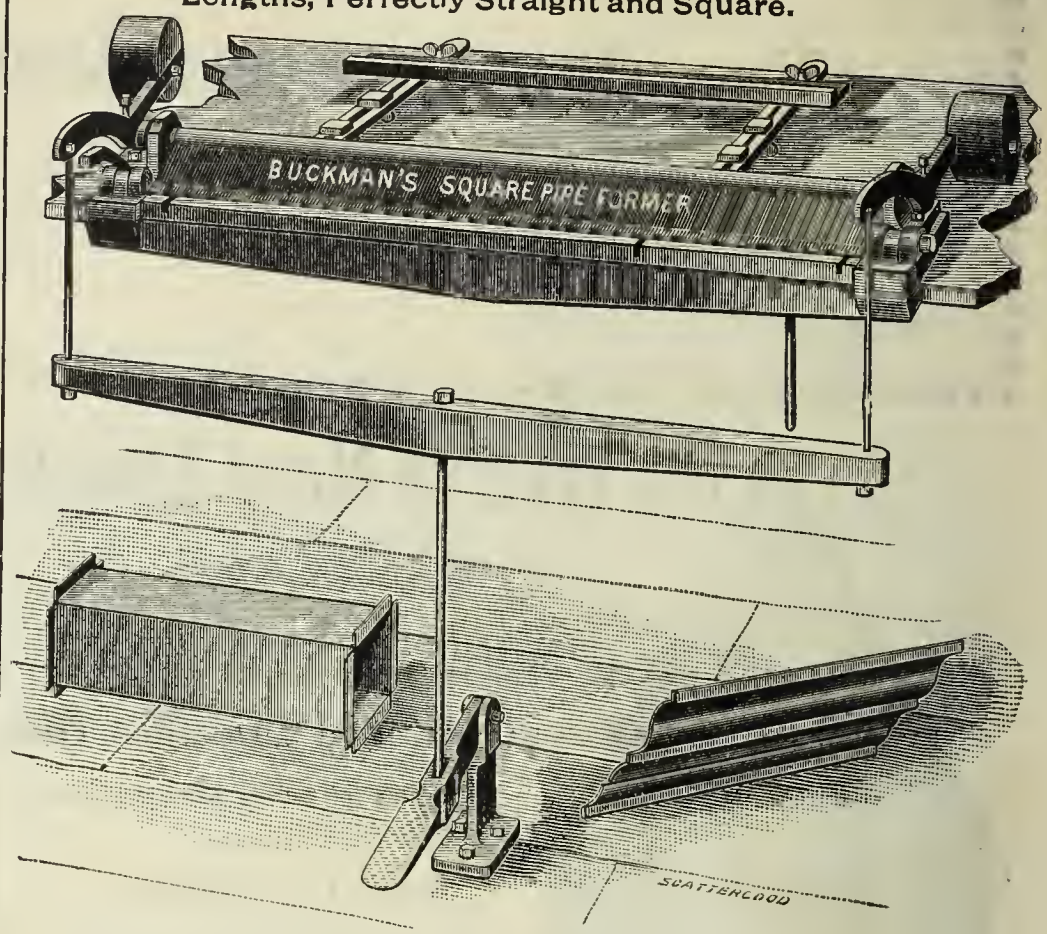
"Crikey !" exclaimed the art patron, on seeking the completed painting. "That almost knocks the stuffin' out of Moses ; but, I say, how he has changed !"

BUCKMAN'S

—IMPROVED—

SQUARE PIPE FORMER AND CORNICE BRAKE

Will form Square Pipe, Two Inches and Larger, in Thirty Inch Lengths, Perfectly Straight and Square.



Pat'd 5-28-89.

WRITE FOR PRICES.

P. B. CALVERT & CO., PHILADELPHIA.

TINNERS' MACHINERY AND SUPPLY CO.,

SUCCESSORS TO

HIBBERD & SPINNER,

Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery, Presses, Dies and Can Makers' Tools.



FULL LINE OF SUPPLIES.

9 CLIFF STREET, NEW YORK CITY.

PATENT AUTOMATIC CAN BODY

SEAMERS.

COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.

218 New St.,

W. J. GORDON, PHILADELPHIA, PA.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor. Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, • • EASTON, PA.

RISING & NELSON,

WEST PAWLET, VT.

MANUFACTURERS OF

RED and GREEN ROOFING SLATE.

Wholesale Dealers in all kinds of Roofing Slate.

CORRESPONDENCE SOLICITED.



Niagara Foot Gap Shear.

NIAGARA

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

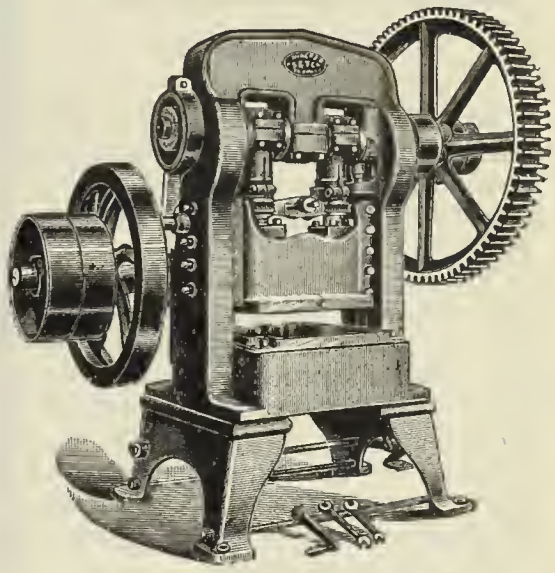
A FULL LINE.

The Best and Most Improved

ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

CORNICE MAKERS' TOOLS.



DOUBLE CRANK POWER PRESS.

PRESSES AND DIES.

Squaring, Slitting and Circle Shears.

Complete Outfits for making Tinware, Cans and Other Sheet Metal Goods.

——MANUFACTURED BY——

THE NIAGARA STAMPING & TOOL CO.,

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**



Punch and Stock Shear.

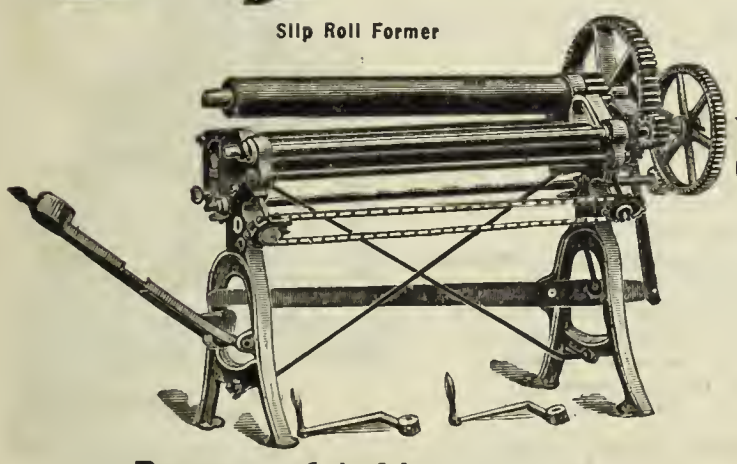
Any Special Tool

THAT YOU MAY NEED WE ARE PREPARED TO MAKE. WE HAVE NOW IN STOCK COMB'D PUNCHES AND SHEARS, SQUARING SHEARS, SLIP ROLL FORMERS AND A LARGE VARIETY OF OTHER SHEET METAL WORKING MACHINERY.



Gap Squaring Shear.

Slip Roll Former



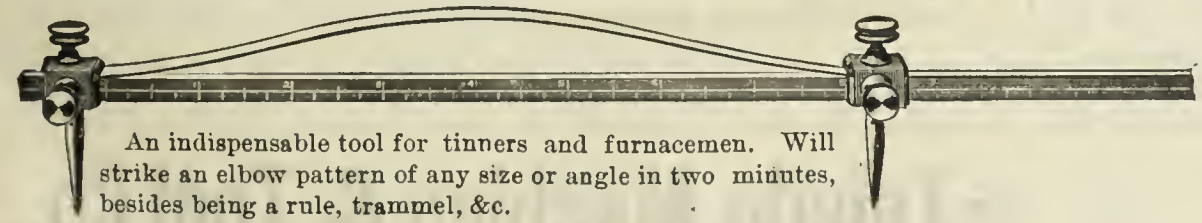
DO YOU KNOW IT WOULD PAY YOU TO WRITE US?

Beware of Infringements.

BERTSCH & COMPANY,

Manufacturers of Sheet Metal Working Mach'y,

CAMBRIDGE CITY, - IND.



An indispensable tool for tinners and furnacemen. Will strike an elbow pattern of any size or angle in two minutes, besides being a rule, trammel, &c.

"MAGIC" PATTERN RULE.

Price Reduced to $3.50 Net Cash.

Complete with Chart. Will pay for itself in a short time.

Se d for Descriptive Circular.

LUFKIN RULE CO.,

SAGINAW, MICH.

POCOCK'S ECCENTRIC

FORMING MACHINE.



We invite your attention to this new Former for Tinners' and Sheet-Metal Workers' Rolls, on which we claim rapidity of operation, superior construction and durability. The back roll is moved by eccentrics instead of screws, and can be changed instantly from the smallest circle to the passing of a straight sheet. It will flare metal easier and better than any other machine in use. You can get closer to front roll, therefore bend a smaller circle. For sale by all leading jobbers. Send for circular to

O. POCOCK, Mfr
363, 365, 367 Clark St
CINCINNATI, OHIO

3-inch Rolls with Slip Rolls a specialty

— "FIGG is always setting a trap for his wife."

"Jealousy, is it?"

"Nope; mice."—*Chicago Inter-Ocean.*

— "WELL," said Hawkins on New Year's Eve, "Eighteen hundred and Ninety four is about over. It has been a pretty tough year."

"Yes: and it's a good thing it was tough," said Watson. "If it hadn't been it would have died six months ago."—*Harper's Bazar.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

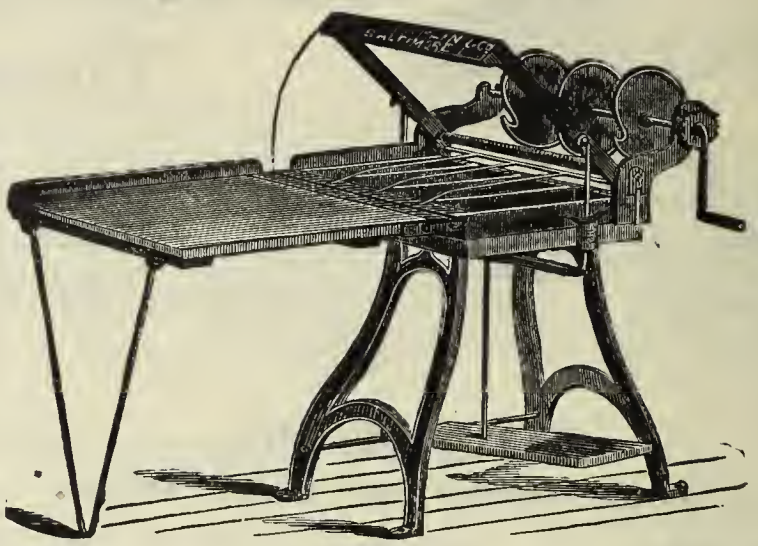
Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

First, for Rapidity of Work.
Second, for Quality of Work.
Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

LYON, CONKLIN & CO.,

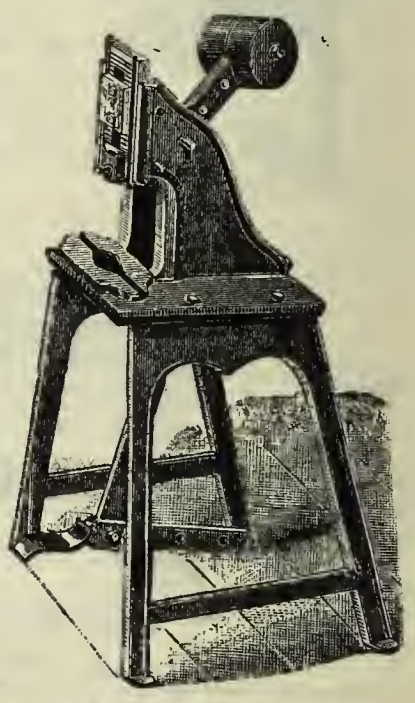
Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.

—OUR—

PENDULUM PRESSES

are suitable for a wide range of work. Grooved beds with sliding bolts for holding all sizes of dies. Perfectly fitted, balanced, and adjustable to light and heavy blows. A first-class machine in every respect.



MANUFACTURED BY

G. A. Crosby & Co.,

176 & 178 So. Clinton St., CHICAGO, ILL., U. S. A.,

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap Makers', and other lines of goods, including Lanterns, Oil and Vapor Stoves, Locks, Hinges, Brass Goods and all Hardware Novelties.

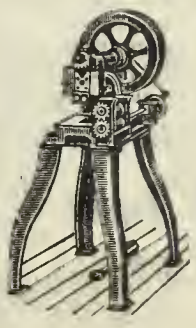
Special Attention to Dies of every Description.

WORK GUARANTEED THE BEST.

Write for Prices and New Catalogue containing full line of Tinners' Tools.

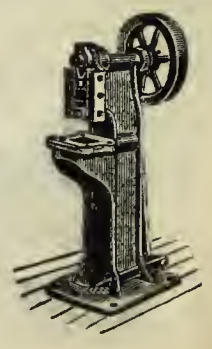
☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.

The Toledo Machine & Tool Co.,



MANUFACTURERS OF

Power Punching Presses, Drop Presses, Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses, Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.



Send for Catalogue now being Printed.

THE TOLEDO MACHINE & TOOL CO.,

Superior and Oak Sts., Toledo, O.

ALPHABETICAL LIST OF ADVERTISERS.

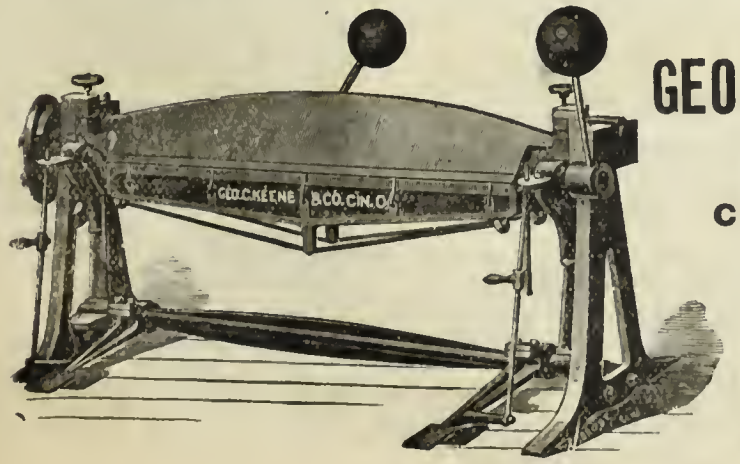
Acme Roofing & Supply Co.. 80
Ætna Standard Iron & Steel Co..... 75
Allen's Corrugating Wks... 79
American Boiler Co..... 23
American Radiator Co..... 1
American Roofing Co..... 80
American Sheet Iron Co..... 77
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 69
Auld & Conger..... 58
Bailey-Farrell Mfg. Co..... 71
Bangor Excelsior Slate Co.. 84
Barstow Stove Co..... 92
Bascom, H. Clay.. 67
Belden, F. E. Mica Mining Co..... 58
Bellaire Stamping Co..... 61
Berger Bros..... 73
Berger, L. D.....72&83
Berger Mfg. Co..... 74
Bertsch & Co..... 85
Bibb, B. C. Stove Co..... 21
Bliss, E. W. Co..... 90
Blodgett, G. S. Co..... 25
Bowen Mfg. Co..... 27
Bower, B. P. & Co..... 72
Bowers Roofing & Metal Wks 73
Brauer, A. G..... 67
Bridgeport Crucible Co..... 66
Brombacher's Sons, Jacob .. 91
Bronson Supply Co..... 65
Bruce & Cook.....78&92
Buffalo Register Works..... 25
Burtis, A. L..... 83
Burton, W. J. & Co..... 83
Calely, Ed. L..... 67
Calvert, P. B. & Co..... 84
Cambridge Iron & Steel Co.. 77
Canfield, H. O..... 70
Canton Steel Roofing Co..... 83
Carton Furnace Co..... 3
Central Oilgas Stove Co..... 7
Central Stamping Co..... 60
Challenge Corn Planter Co.. 26
Chamberlain, J. W. Co..... 70
Cheney, S. & Son..... 69
Chicago & Erie Stove Co..16&20
Cincinnati Corrugating Co.. 82
Clark, G. M. & Co..... 10
Clark Novelty Co..... 71
Clark, Quien & Morse..... 72
Clayton & Lambert Mfg. Co. 68
Cleveland Gas Machine Co.. 69
Clough, R. M 87
Columbia Refrigerator Co.. 26
Colwell Lead Co..... 69
Connecticut Plating Co..... 86
Cooney, Selner & Co..... 72
Cope, Geo. W..... 67
Corning Mfg. Co. 21
Correspondence School of Mechanics..... 57
Cortright Metal Roofing Co. 81
Cory, U. & Co... 23
Covert Mfg. Co..... 70
Craig-Reynolds Fdy. Co..... 20
Crosby, G. A. & Co..... 86
Curtis & Curtis..... 71
Dalton-Ingersoll Co..... 68
Dangler Stove & Mfg. Co.... 11
Day Mfg. Co..... 69
Dayton Mfg. Co..... 13
De Haven & Co..... 15
Deming Co..... 71
Dixon, Jos., Crucible Co..... 83
Douglas, W. & B..... 71
Dover Machine Works..... 87
Dwight Slate Machine Co.... 90
Eckstein, Chas. G. & Co..... 90
Electric Boiler Co..... 21
Eller, J. H. & Co..... 82
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 83
Ferrosteel Co..... 15
Follansbee Bros. Co..... 76
Fostoria Steel Roofing Co... 81
Fox, Chas. F..... 58
Frink, I. P 92
Friedley & Voshardt..... 80
Froelich, A., Estate of..... 66
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 83
Garry Iron & Steel Roofing Co 81
Gouder & Paeschke Mfg. Co. 64
Giblin & Co..... 19
Glenmore Foundry & Machine Co..... 27
Globe Iron Roofing & Corrugating Co..... 81
Globe Ventilator Co..... 67
Gobeille Pattern Co..... 67
Gordon, W. J..... 84
Gorton & Lidgerwood Co..... 1
Graff & Co..... 20
Greene, W. F 59
Green, S. & Sons..... 82
Griswold Mfg. Co..... 59
Gummey, Spering & Co..... 75
Gurney Heater Mfg. Co..... 19
Gurney Refrigerator Co..... 26
Halliday, M..... 81
Hamilton, John..... 92
Hart & Crouse..... 22
Hartford Hollow Ware Co.. 67
Haslet, Flanagen & Co..... 62
Hess, Snyder & Co..... 23
Highland Foundry Co..... 1
Highton, Wm. & Sons..... 25
Holton Iron Roofing Co..... 80
Howard Furnace Co..... 28
Howard Thermostat Co..... 19
Howson & Howson..... 57
Illinois Zinc Co..... 78
Indiana Ladder Co..... 61
Illinois Refrigerator Co..... 26
Iwan Bros..... 61
Jackson's Sons, W..... 22
Jenkins Bros..... 1
Jersey City Galvanizing Co. 58
Johnson, E. J. & Co 83
Kanneberg Roofing Co..... 73
Kansas City Metal Roofing & Corrugating Co..... 77
Keen & Hagerty..... 61
Keene, Geo. C. & Co..... 87
Kelly, Thos. & Bro..... 68
Kemp, C. M Mfg. Co..... 73
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 61
Kewanee Boiler Co..... 24
Kieckhefer Bros. & Co..... 60
Kieley, T..... 1
Kilbourne & Jacobs Mfg. Co. 63
Lawrence-Letts Elbow Co... 70
Lawson, F. H. Co..... 63
Lindemann, A. J. & Hoverson Co..... 14
Littleford Bros..... 80
Lufkin Rule Co..... 85
Lyon, Conklin & Co.... 86
McClure & Co..... 92
McDaniel & Harvey Co..... 78
McLaughlin, J. K..... 67
McLeod & Henry Co..... 66
Mabony, M..... 24
Marcy Stove Repair Co..... 66
Marlin & Co..... 72
Marston, I. G. & Co..... 69
Mason & Davis Co..... 14
Mason Regulator Co..... 1
Merchant & Co., Inc..... 77
Merry, Geo. E..... 75
Meurer Bros. Co..... 79
Mica Mfg. Co..... 58
Michigan Stove Co..... 17
Michigan Vapor Stove Co... 13
Millar, Chas. & Son..... 92
Miller, Jas. A. & Bro.....73,80&81
Miner & Peck Mfg. Co..... 90
Monarch Stove Co..... 8
Montross Metal Shingle Co.. 83
Mowry, W. C..... 21
Mullins, W. H..... 81
Munsell, E. & Co... 58
Myers, F. E. & Bro..... 71
National Wringer Co..... 64
Newark Regulator Co..... 71
New Castle Steel & Tin Plate Co..... 75
New York Central Iron Wks. 19
New York Elbow Co..... 66
New York Iron Roofing & Corrugating Co..... 82
New York Metal Ceiling Co.. 82
New York Nickel Plating & Mfg. Co..... 61
Niagara Stamping & Tool Co. 85
Niles Mfg. Co..... 64
North Bros. Mfg. Co..... 60
Obdyke, W. A. & Co..... 72
Obermayer, S. Co..... 66
Ohl, Geo. A. & Co 90
Osborn, J. M. & L. A..... 73
Ostrander, W. R. & Co..... 59
Page Boiler Co., Wm. H..... 22
Palermo Mica Co..... 58
Pancoast, Henry B. & Co.... 70
Paxson, J. W. & Co..... 63
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 71
Penn Iron Roofing & Corrugating Co..... 80
Perry Stove Co..... 12
Phelps, Dodge & Co..... 76
Phillips, F. R..... 75
Pocock, O..... 85
Pontyminster Old Style Ternes..... 77
Poorman Mfg. Co..... 91
Portsmouth Stove & Range Co..... 16
Presbrey Stove Lining Co... 67
Putnam Foundry & Machine Co..... 22
Rasner & Dinger..... 80
Republic Iron Works, ... 79
Rhodes, Dickelman & Co.... 82
Ringen Stove Co..... 2
Rising & Nelson..... 84
Robinson, J. M. & Co..... 91
Rochester Stamping Wks.... 62
Rome Mfg. Co..... 65
Root, A. L..... 83
Rutland Fire Clay Co..... 67
St. Louis Corrugating Co.... 79
St. Louis Stamping Co..... 65
S S. S. Conduotor Co..... 73
Salem Nail Co..... 83
Sanborn, John..... 83
Saunders' D. Sons..... 69
Savill, Walls & Co..... 70
Sayre Stamping Co..... 59
Schaffer, J. P..... 24
Schneider & Trenkamp Co.. 9
Severding, John..... 69
Shepard, Sidney & Co..... 62
Sheppard, Isaac A. & Co..... 1
Silver & Co 65
Sims Mfg. Co. 70
Smith & Winchester Co..... 22
Smith Co., H. B..... 24
Smith, J. D. Foundry Supply Co..... 67
Souther, E. E. Iron Co..... 77
Special Notices..... 57
Sperry, D. R. & Co..... 65
Standard Lighting Co..... 6
Star Coupler Co..... 23
Star Mfg. Co..... 62
Stebbins, E. Mfg. Co..... 69
Steel Clad Bath Co..... 69
Stellwagen & Kynoch..... 25
Stiles & Parker Press Co... 90
Stocking, E. B..... 57
Sykes Iron & Steel Roofing Co 81
Taplin, Rice & Co..... 16
Tarbox Mfg. Co..... 66
Taylor Co., N. & G..... 92
Thatcher Furnace Co..... 18
Thorn Shingle & Ornament Co..... 82
Tinners' Machinery & Supply Co..... 84
Tinplate Decorating Co..... 82
Toledo Machine & Tool Co.. 86
Troy Nickel Works..... 27
Tuttle & Bailey Mfg. Co..... 25
United States Heater Co.... 24
Valentine, M. D. & Bro. Co... 67
Van Namee, G. L. Mfg. Co.... 58
Van Noorden, E. & Co..... 83
Van Range Co., John..... 4
Vedder Pattern Works..... 67
Vogel, William & Bros..... 64
Waas, Geo. D..... 25
Washburne, E. G. & Co..... 67
Wayne, Jos. W..... 27
Weathered's, Thos. W. Sons 13
Western Stove & Mfg. Co.. 8
Wheeling Corrugating Co... 81
Whitlock, W..... 71
Wise, John & Son..... 61
Wister, L. & R. & Co..... 92
Wohler Aluminum Co..... 62
Wood, Alan Co..... 79
Wood Co., W. Dewees..... 92
Yates & Co..... 57
Zero Valve Co..... 69

THE KEENE FOOT POWER

CORNICE BRAKE.

EASIEST TO OPERATE, STRONGEST AND BEST.

Sheet Metal Working Machinery of all Kinds.



GEO. C. KEENE & CO.,

Cincinnati, O.

AGENTS:

Hibberd & Spinner,
9 Cliff St., New York

Holder & Herrick,
49 Broad St., Boston, Mass.

Ledwidge & Co.,
234 Lake St., Chicago, Ill.

PRESSES, DIES AND TOOLS

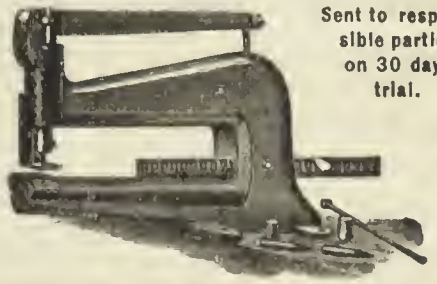
For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS., Dover, Del.



Sent to responsible parties on 30 days' trial.

CLOUGH'S IMPROVED FOOT PRESS,

For Sheet Metal Work. Punches to center of 86 in. sheet or 5 in. pipe 30 in. long. Handiest Press made. Dies and Punches furnished with every Press. Weight about 175 lbs. For Descriptive Circular and Price, address

R. M. CLOUGH, Tolland, Conn.

CLASSIFIED LIST OF ADVERTISERS.

Aluminum.
Shepard, Sidney & Co., Buffalo, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield, H. O., Bridgeport, Conn.

Bathtubs.
Dalton-Ingersoll Co., Boston, Mass.
Day Mfg. Co., Detroit, Mich.
Peck Bros. & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Cement.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.

Chucks.
Whitlock, W., 39 Cortlandt St., N. Y.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing & Supply Co., Canton, O.
Allen's Corrugating Works, Chicago, Ill.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A. & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford, Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Corrugating Works, Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cresting.
Green, S. & Son, Des Moines, Iowa.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Rhodes, Dickelman & Co., Forest, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Rhodes, Dickelman & Co., Forest, O.
Severding, Jno., Richmond, Ind.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
McLeod & Henry Co., Troy, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Flour Bins and Sifters.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Foundry Facings Supplies and Tools.
Ohermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Craig-Reynolds Foundry Co., Dayton Ohio.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Thatcher Furnace Co., 240 Water St., N. Y.

Furnaces, Plumbers' and Tinners'.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Cleveland Gas Machine Co., Cleveland Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N. Y.
Poorman Mfg. Co., Canton, Ohio.

Heaters, Steam and Hot Water.
American Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Fuller & Warren Co., Troy, N. Y.
Glenmore Foundry & Mch. Co., Phila., Pa.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
McLain, J. H. Co., Canton, Ohio.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Smith Co., H. B., 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass.
Thatcher Furnace Co., 240 Water St., N. Y.
United States Heater Co., Detroit, Mich.
Weathered's, Thos. W. Sons, 139-143 Centre Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Shepard, Sidney & Co., Buffalo, N. Y.
Silver & Co., Brooklyn, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Ice Cream Freezers.
North Bros. Mfg. Co., Phila., Pa.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
Lawson, F. H. Co., Cincinnati, Ohio.
McDaniel & Harvey Co., Philadelphia, Pa.
Mercbant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalamelned.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lawson, F. H. Co., Cincinnati, Ohio.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Ladders.
Indiana Ladder Co., Indiana, Pa.

Lamp Stoves and Heaters.
Central Oilgas Stove Co., Boston, Mass.
Perry Stove Co., Albany, N. Y.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.
Penn Iron Roofing & Corrugating Co., Ltd., Philadelphia, Pa.

Metallic Lathing.
Jersey City Galvanizing Co., 112 John St., N. Y.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Ohermayer, S. & Co., Cincinnati, Ohio.
Smith, J. D. Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.

Oil Cans.
Central Oilgas Stove Co., Boston, Mass.
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges, Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Pattern Charts.
Burtis, A. L., Lockport, N. Y.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Caiely, Edw. L. Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, John K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Plating Co., Phila., Pa.

Plumbago.
Ohermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers' Slate.
Fairbaven Marble & Marbleized Slate Co., Fairbaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Bower, B. P. & Co., Cleveland, O.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
Star Coupler Co., St. Louis, Mo.
Stebbins, E. Mfg. Co., Brigbtwood, Mass.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 45 Vesey St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water.
American Radiator Co., Chicago, Ill.
Exeter Machine Works, Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., N. Y.

Refrigerators.
Bower Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co., Grand Haven, Mich.
Columbia Refrigerator Co., Northville, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.
Illinois Refrigerator Co., Chicago, Ill.
Wayne, Jas. W., Cincinnati, Ohio.

Registers.
Buffalo Register Works, Buffalo, N. Y.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman Street, New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N. Y.
Silver & Co., Brooklyn, N. Y.
Wise, J. & Son., Butler, O.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel, Corrugated and Plain.
Acme Roofing & Supply Co., Canton, O.
American Roofing Co., Cincinnati, O.
Berger Mfg. Co., Canton, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, O.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing & Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Penn Iron Roofing & Corrugating Co., Ltd., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugating Co., St. Louis, Mo.
Souther E. E. Iron Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGE 87.

Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Conn.
Lyon, Conklin & Co., Baltimore, Md.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Gait, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.
Rising & Nelson, West Pawlet, Vt.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bromhacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co., Toledo, O.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing & Corrugating Co., Philadelphia, Pa.
Thorn Shingle & Ornament Co., Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Steam & Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Pattern.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Waas, Geo. D., 136 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Fox, Chas. F., Dayton, Ohio.
Stellwagen & Kynoch, St. Ignace, Mich.
Van Namee, G. L. Mfg. Co., Gouverneur, N. Y.

Stoves and Ranges.
Bibb, B. C. Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
DeHaven & Co., Pittsburgh, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co., Boston, Mass.
Mason & Davis Co., Chicago, Ill.
Michigan Stove Co., Chicago, Ill.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Taplin, Rice & Co., Akron, O.
Thatcher Furnace Co., 240 Water St., N. Y.
Van, John, Range Co., Cincinnati, O.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Perry Stove Co., Albany, N. Y.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Central Oilgas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, O.
Dayton Mfg. Co., Dayton, O.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Michigan Vapor Stove Co., Grand Rapids, Mich.
Monarch Stove Co., Mansfield, O.
Perry Stove Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Western Stove & Mfg. Co., Milwaukee. Wis.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Pattern Rules.
Lufkin Rule Co., Saginaw, Mich.

Tinning Machines.
Phillips, F. R., Phila., Pa.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Bruce & Cook, 186 to 190 Water St, N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Lawson, F. H. Co., Cincinnati, Ohio.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Keen & Hagerty, Baltimore, Md.
Kleckhefer Bros. & Co., Milwaukee, Wis.
Lawson, F. H. Co., Cincinnati, Ohio.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Acme Roofing & Supply Co., Canton, O
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N.Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, Geo. A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.

Traps and Vents.
Bower, B. P. & Co., Cleveland, O.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 87.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA, AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - - -	$1.00	SIX MONTHS, - - - - - - -	$22.10
ONE MONTH (5 Times), - - - - -	5.00	ONE YEAR, - - - - - - - -	40.30
THREE MONTHS, - - - - - - -	12.35		

Rates for larger spaces quoted on application.

DAVID WILLIAMS, Publisher.

96, 98, 100 and 102 Reade Street, NEW YORK. — **59 Dearborn Street, CHICAGO.**

New York (Main Office), - -	96-102 Reade Street, - - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509 Hamilton Building, - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - - - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - - -	HENRY SMITH, Manager.
St. Louis, - - - - - -	Bank of Commerce Building, - - - - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - -	312 The Cuyahoga, - - - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

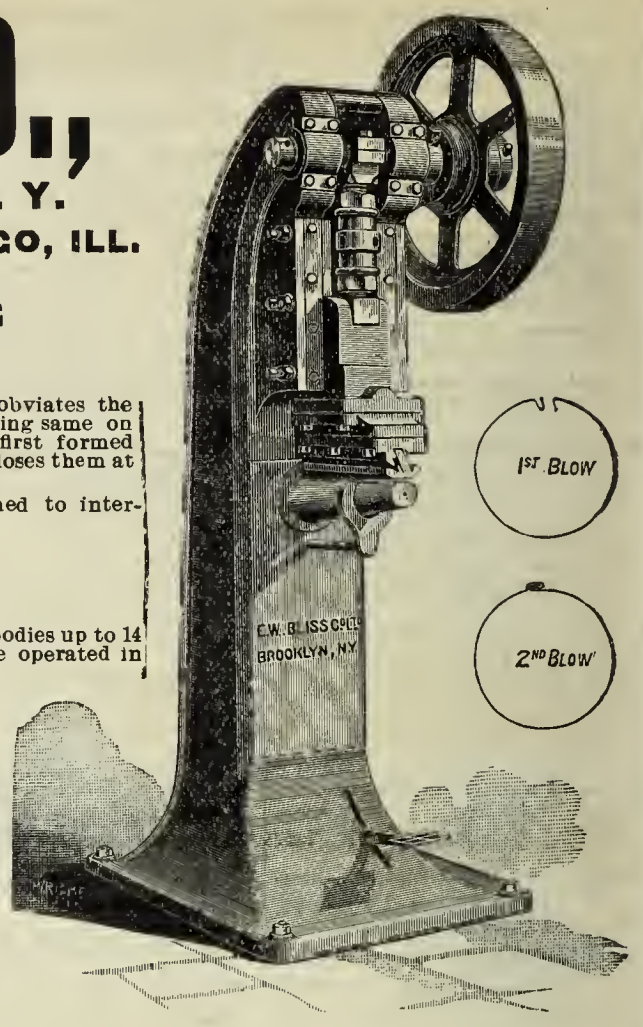
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.



PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

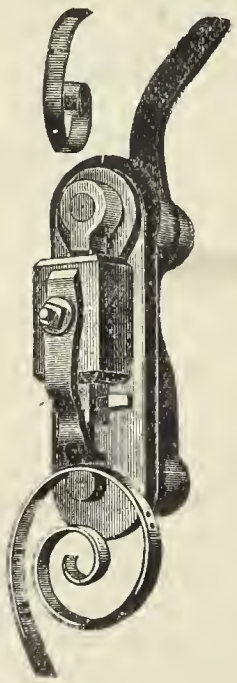
DIES, SPECIAL MACHINERY &c.

THE STILES & PARKER PRESS CO.

CHAS. G. ECKSTEIN & CO.,

45 Vesey St., New York.

Punches and Shears, Wrought Iron Ornaments, Mouldings, Rosettes, Fence Pickets, etc.



Compact Form, Simplicity, Durability.

Best Workmanship, Few Parts, Low Price.

SEND FOR CIRCULAR.

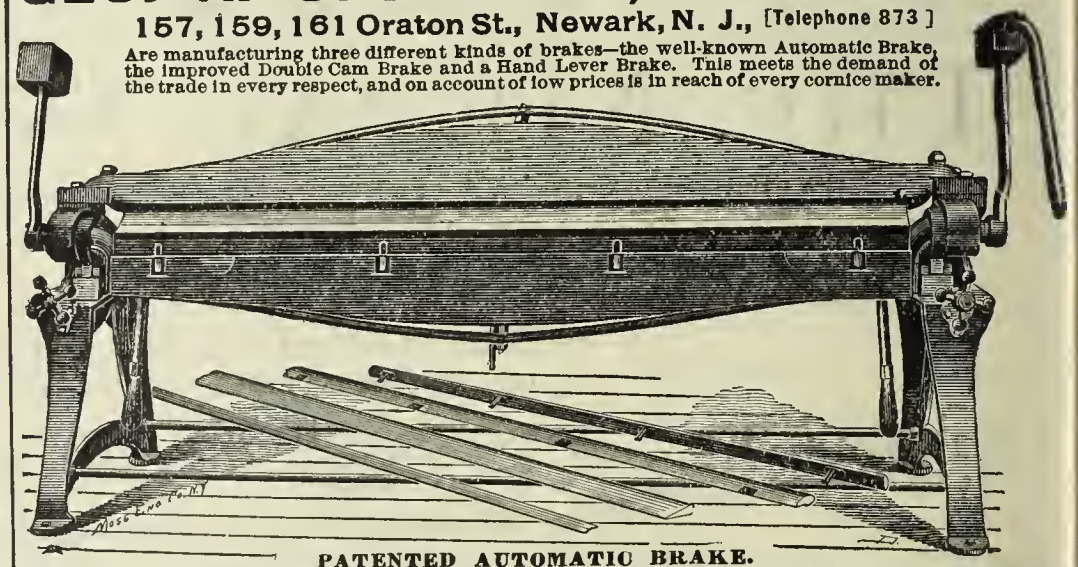
IF YOU WANT ANYTHING IN THE LINE OF
DROP PRESSES, DROP HAMMERS, STAMPS OR AUTOMATIC DROP LIFTERS.
SEND FOR CATALOGUE TO
Miner & Peck Mfg. Co.
NEW HAVEN, CONN.
LARGEST LINE IN THE MARKET

GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co..

157, 159, 161 Oraton St., Newark, N. J., [Telephone 873]

Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

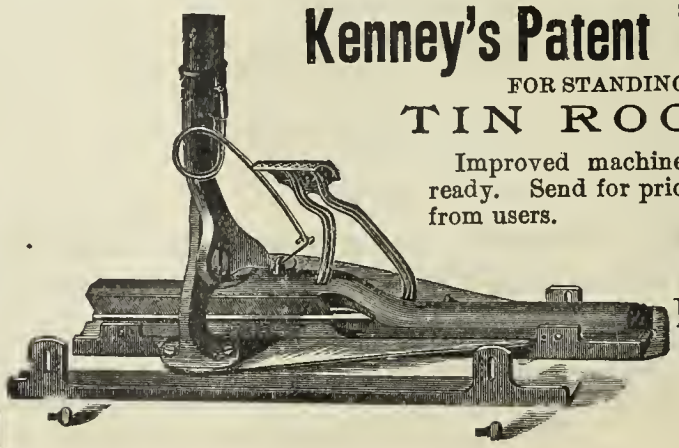
We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892 Send for our illustrated catalogue.

Kenney's Patent Double Seamer

FOR STANDING LOCK

TIN ROOFING.

Improved machine, from new patterns, now ready. Send for prices and flattering testimonials from users.



MANUFACTURED BY

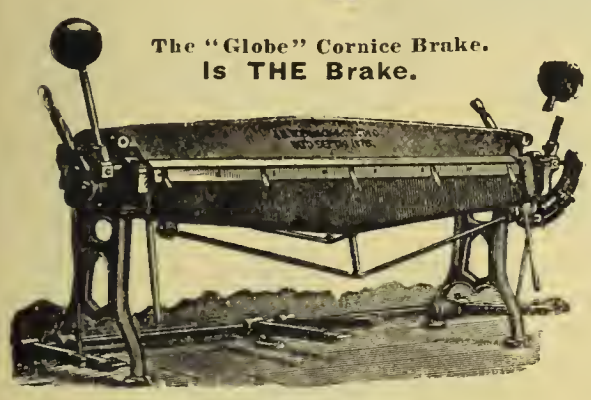
Dwight Slate Machine Co.,

Hartford, Conn.

THE METAL WORKER



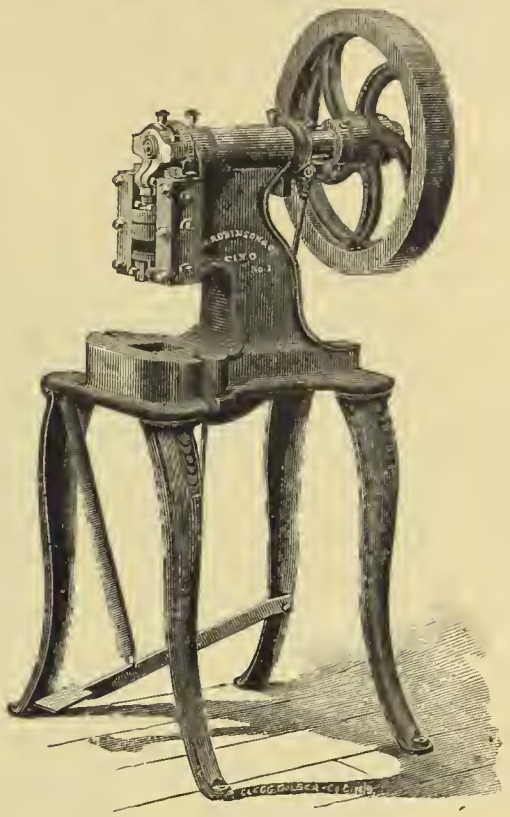
The "Globe" Cornice Brake.
Is THE Brake.



Cannot expect to do good work, nor economically, until he has supplied himself with the devices and machinery made for working sheet metal. A glance through our Catalogue will indicate that we make a large number of machines especially adapted for working sheet metal into any desired form. Our devices are made to give satisfaction, and they do wherever in use, as numerous letters on file testify. Write us for prices and estimates on outfits.

J. M. Robinson & Co.,

ADDRESS
S. E. Cor. 2d St. & Central Ave.,
CINCINNATI, O.





Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

All set up ready to use. Price, $30.00. Freight allowed to points as far West as Missouri River, and as far South as Galveston, Tex.

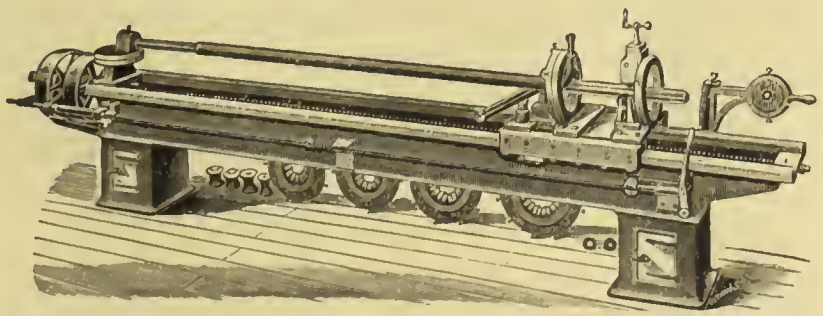
FOR SALE BY
Hall & Carpenter.
Philadelphia, Pa.
Austin & Doten,
Boston, Mass.,
Hackett Hdw. Co ,
St. Paul, Minn.
and jobbers generally.

If your jobber can't supply you, order direct of the manufacturers.

SEND FOR CATALOGUE.

JACOB BROMBACHER'S SONS - **No. 30 Cliff St., N. Y City.**
Established 1833. Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

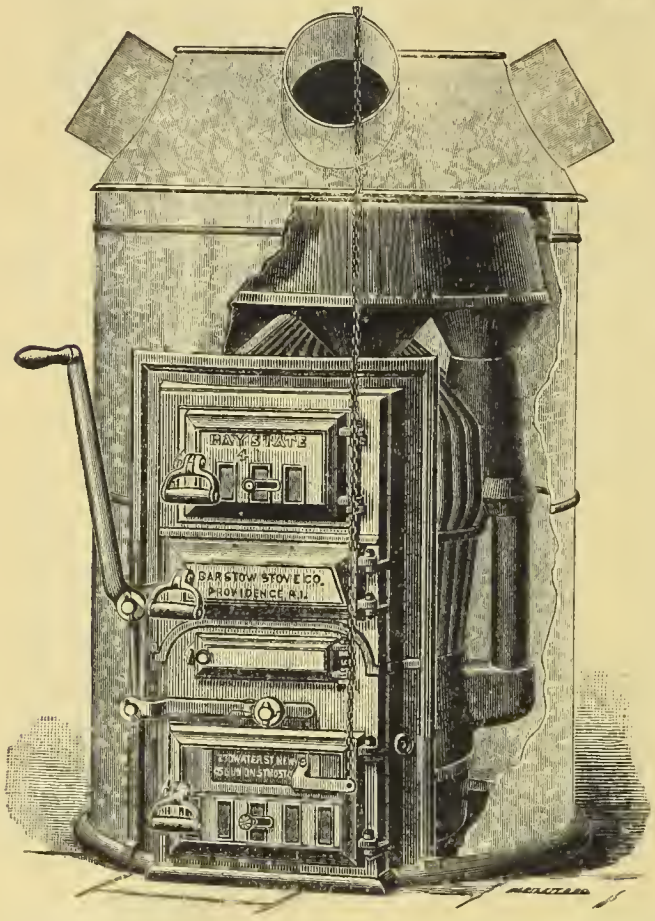
Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller
96-102 Reade Street, New York.

THE CELEBRATED

"Bay State" Furnace.

All Cast Iron, with Self-Cleaning Flues.
Adapted for Hard or Soft Coal.



Why not get our prices and send for descriptive circular?

BARSTOW STOVE COMPANY,

INCORPORATED,

BOSTON. PROVIDENCE, R. I. **NEW YORK.**

Tin for Door Linings.

12 x 24		14 x 22
13 x 26	Primes and	11 x 22
13½ x 19½	Wasters.	15 x 21
14 x 18¾	Light Weight	16 x 20
14 x 19¼	and	16 x 22
14 x 20	Full Weight.	20 x 20
14 x 21		20 x 28

Furnace Pipe Tin, IC and IX.

20 x 23 for 7 inch pipe.
20 x 26 " 8 " "
20 x 28 " 8 " "
20 x 29½ " 9 " "
20 x 32½ " 10 " "
20 x 38½ " 12 " "

ORDERS FILLED PROMPTLY.

N. & G. TAYLOR CO.,

Manufacturers of Tinplate,

PHILADELPHIA.

ESTAB. 1857.



The Great CHURCH LIGHT.
Frink's Patent Reflectors for Gas, Oil or Electric, give the most powerful, softest, cheapest and best light known for Churches, Stores, Banks, Theatres, Depots, &c. New and elegant designs. Send size of room. Get circular and estimate. A liberal discount to churches and the trade. *Don't be deceived by cheap imitations.* **I. P. FRINK, 551 Pearl St., N. Y.**

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

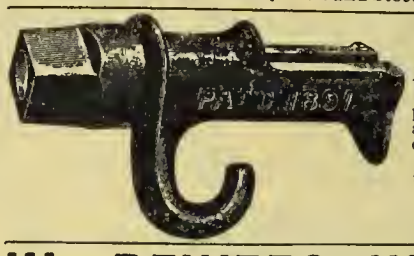
Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK

TINNERS' TOOLS and MACHINES

TINNERS' SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOO

By far the best Spout made. Greatly proved this season. More used every year th all others combined. Sold by leading jobb everywhere, and to them by

CHARLES MILLAR & SON, Utica, N.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. Al WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh, Pa.

HAMILTON'S
BEST REDIPPED AMERICAN ROOFING TIN

is DIPPED AND REDIPPED by HAND, and is NOT coated b machines through ROLLS like some plates that are laude so highly by the makers, and the coating on Hamilton' Best Redipped is as heavy on the TOP half of the sheet a it is on the BOTTOM half. You have scales, test it. We ca furnish machine coated plates with 20 lbs. of coating t the box of I. C. 20 x 28 at $11.50 per box, fully equal t any of the so-called extra coated plates.

JOHN HAMILTON,

PITTSBURGH, PA.

McCLURE'S REDIPPED
ROOFING TIN.

AMERICAN MADE.

The durability of a Roofing Plate is in the amount and quality of Coating and not in the iron.

McCLURE'S REDIPPED

Is the finest and heaviest coated Roofing Plate made; guaranteed to contain **35 lbs. Coating** per 112 sheets.

To reduce the price of a Roofing Plate is simply to reduce the quality and amount of coating, thereby making a much inferior plate.

The high quality of **McClure's Redipped** will always be maintained as it is our desire to make the **finest and heaviest coated** Roofing Plate in the market regardless of any cost.

The best is always the cheapest.

McCLURE & CO., Pittsburgh, Pa.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

LIII. R 8. NEW YORK AND CHICAGO, FEBRUARY 23, 1895. ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



AMERICAN RADIATORS (TRADE-MARK.) BEST ON EARTH.

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

NATIONAL.

111 and 113 Lake Street, CHICAGO, ILL.

York. re St. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F&WCO

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.
FULLER & WARREN CO. TROY. N.Y

HOT AIR PARAGON FURNACES

ISAAC A. SHEPPARD & CO.
MANUFACTURERS
PHILADELPHIA, PA.
AND
BALTIMORE, MD.

SIX POINTS
1. FEWEST JOINTS. 2. EQUALIZED DRAFT
3. LARGEST RADIATING SURFACE
4. ABSOLUTELY SELF CLEANING
5. BALL BEARING GRATE
6. PERFECT ADAPTABILITY TO ANY KIND OF FUEL.

OUR FURNACE BOOK
"HINTS ABOUT HEATING"
MAILED FREE
IT WILL INTEREST YOU
IT MAY
HELP YOU

The Best Galvanized Iron

t not to require specification, for a first-rate job of ult work can't be done without it, and a first rate job less with it than an honest attempt at a first-rate job out it.

ery first-rate metal-worker probably knows that lo is true to gauge and flat and bendable.

is of some little account that the top and bottom ts of a bundle are cushioned against the bands; and e delivered almost without blemish, just as the top and m sheets protect the inside sheets from the bands in r makes.

pollo Best Bloom is the trade-mark. It costs a little : in large quantities. This is the only reason that r galvanized iron is sold at all.

APOLLO IRON AND STEEL COMPANY,
Pittsburgh Pennsylvania
WORKS AT APOLLO
for new Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES
HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.
"Kitchen Boiler Connections."
A Selection of Practical Letters and Articles
—RELATING TO—
Water Backs and Range Boilers.
Compiled from *The Metal Worker*.
71 Illustrations.
A Practical Helper. Price, $1.00.
DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG
Has no terror for those using a
FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.
All Steel. Durable, Simple and Economical.
Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.
EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

ULATORS

all purposes where any kind utomatic Regulation of Air, er or steam is required.

ASON REGULATOR CO.,
Boston, Mass.



JENKINS' PACKING

Is all right, so say thousands of Engineers. We have positively refused many times to cheapen the quality to compete with other makers. It is better to-day than when first put on the market 20 years ago. It is cheaper than many other kinds because it does not weigh as much per yard. It is honestly made, and will do all that any other Packing will do and has advantages that no other has.

JENKINS BROS., New York, Chicago, Philadelphia, Boston.

STEAM SPECIALTIES.
Pump Governors,
Steam Traps
Steam and Water Reducing Valves, Noiseless Back Pressure Valves, Damper Regulators and Oil Separators.
Send for Circulars.



Water Pressure Regulator
T. KIELEY, 7 to 11 W. 13th St., NEW YORK.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

ST. LOUIS.

Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

Hot Water & Steam Boilers & Furnaces.

16

DISTINCTLY DIFFERENT STYLES.

THE LARGEST VARIETY.



OUR CARTON LOW GAS TIGHT.

FOR ALL KINDS OF FUEL.

Our Heaters of to-day are the product of

48 YEARS

of the study and knowledge as the makers of

Heating Apparatus.

OUR CATALOGUE AND PRICES WILL INTEREST YOU.

MANUFACTURED BY

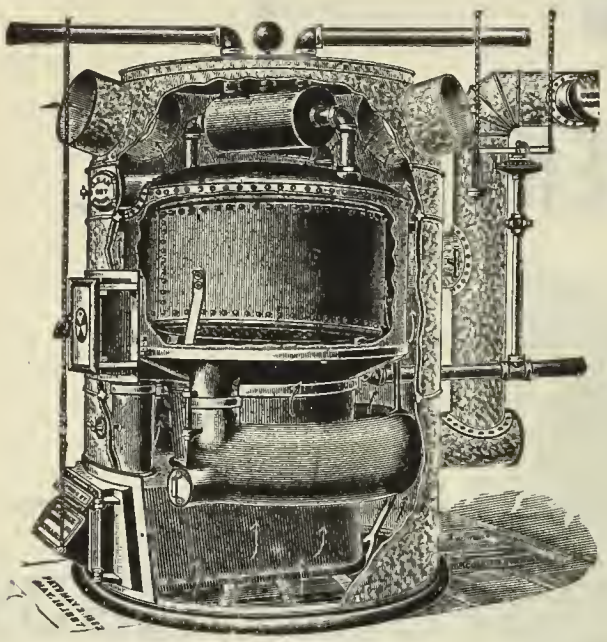
Carton Furnace Co.,

UTICA, N. Y.,

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

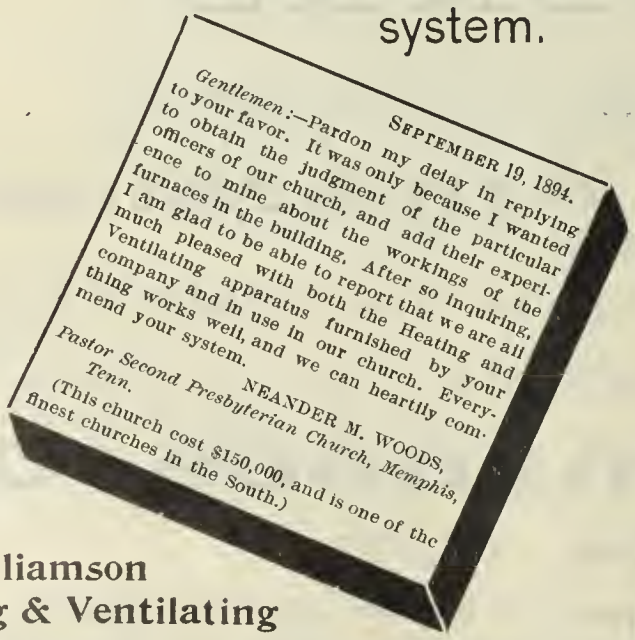
Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

$150,000

Heated and Ventilated By

The Peck-Williamson system.

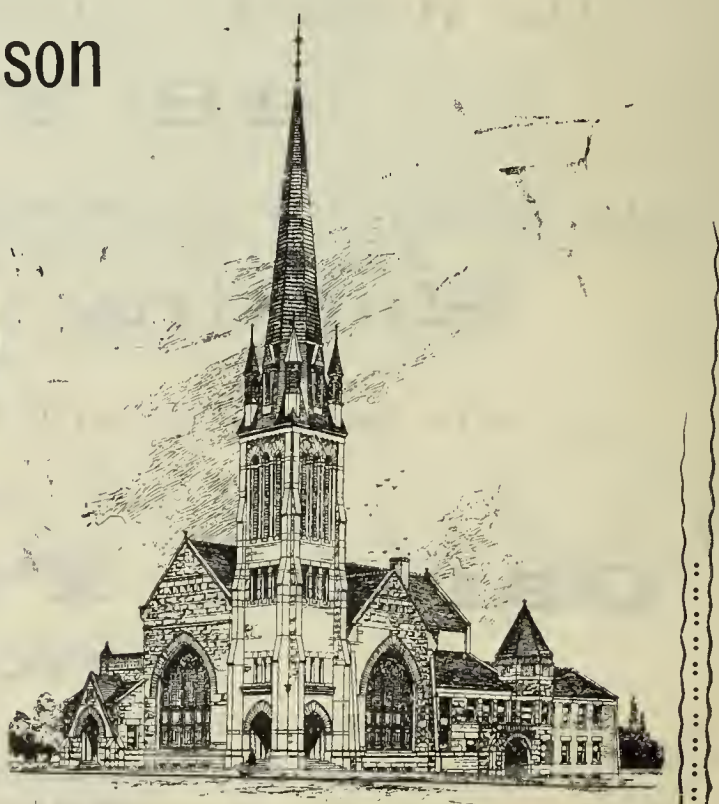


SEPTEMBER 19, 1894.

Gentlemen:—Pardon my delay in replying to your favor. It was only because I wanted to obtain the judgment of the particular officers of our church, and add their experience to mine about the workings of the furnaces in the building. After so inquiring, I am glad to be able to report that we are all much pleased with both the Heating and Ventilating apparatus furnished by your company and in use in our church. Everything works well, and we can heartily commend your system.

NEANDER M. WOODS,
Pastor Second Presbyterian Church, Memphis, Tenn.

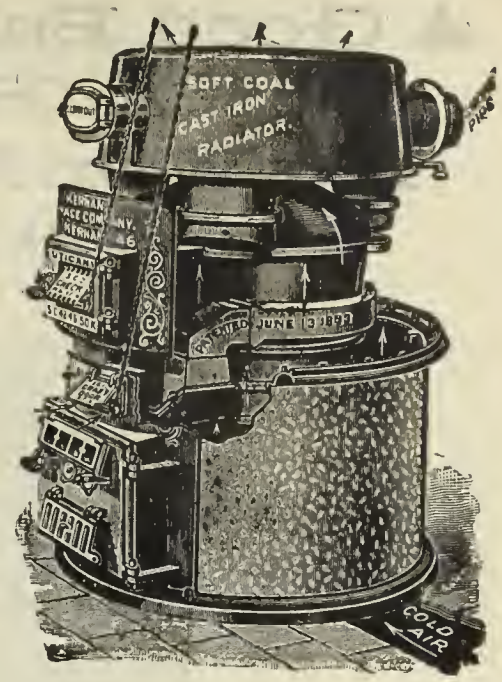
(This church cost $150,000, and is one of the finest churches in the South.)



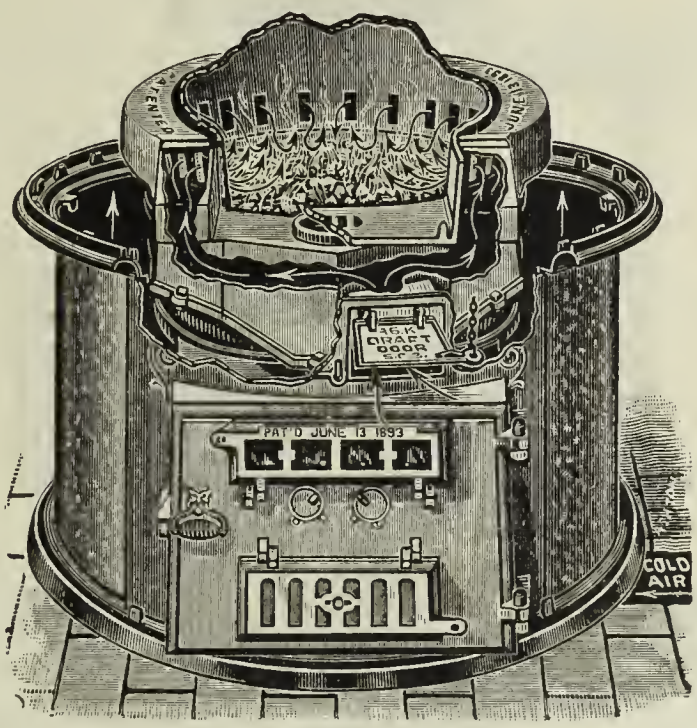
The Peck-Williamson Heating & Ventilating Co.,

Chicago—82 Washington St.
St. Louis—1206 Olive St.
Pittsburg—306 Wood St.
Webster City—Iowa.

KERNAN Smoke Consumers Lead



In all the sections of the country where soft coal is used.



SECTIONAL VIEW,
showing the principle in the Kernan Smoke Consumer Furnace of a heated current of air entering the fire-pot, igniting with and consuming the smoke from soft coal.

Now is the time to secure the agency and thereby control the furnace trade of your locality. Do not waste time and money experimenting on new and untried constructions. The

Kernan Smoke Consumers

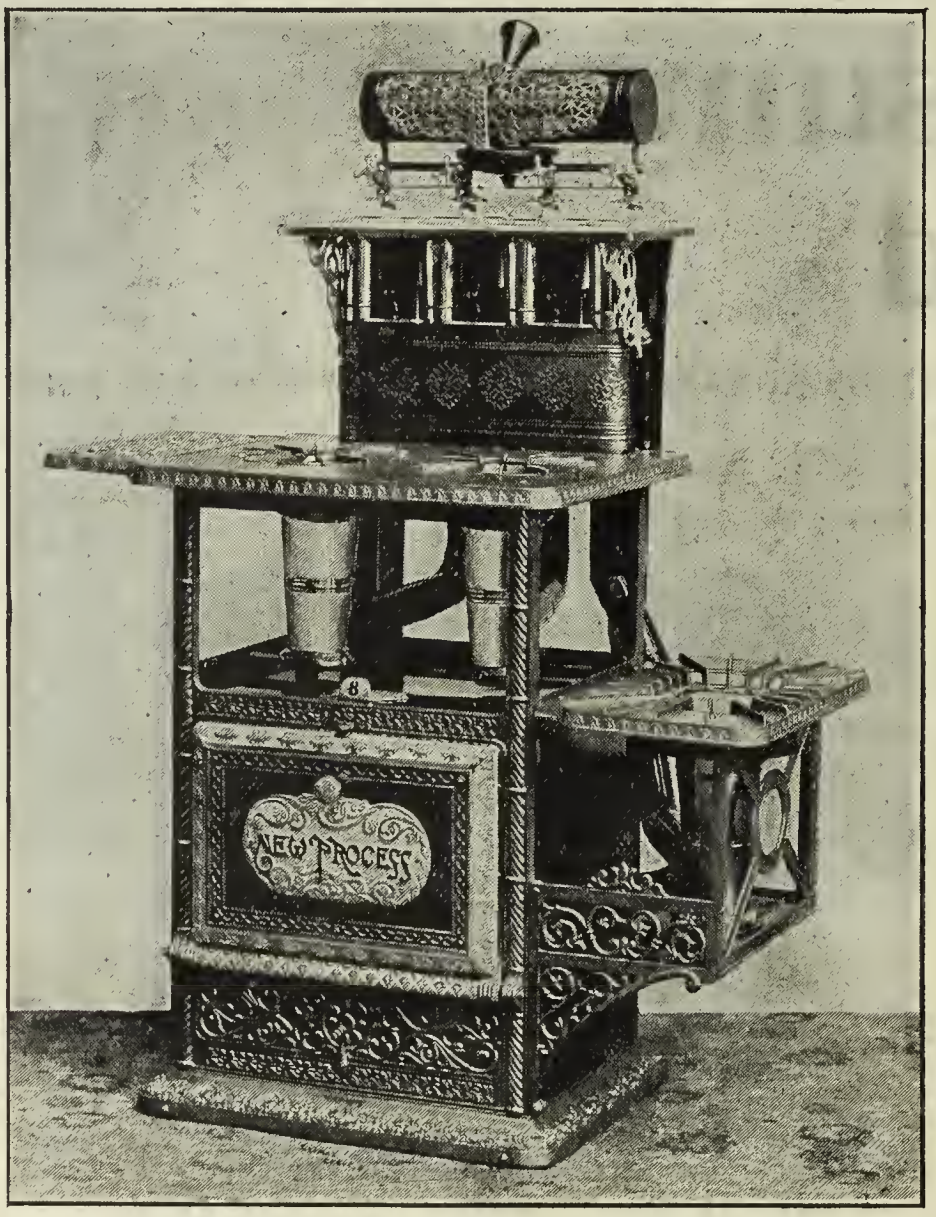
have been used for several years in all parts of the country and with every variety of soft coal, and are now conceded by the trade and public to be the only warm air furnace in which soft coal can be cleanly and economically used.

Send for Reference Catalogue of Soft Coal Furnaces.

Kernan Furnace Company,

71 W Washington St., CHICAGO, ILL. UTICA, N. Y.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better—to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

—MADE ONLY BY—

THE STANDARD LIGHTING CO.,

CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co, Terre Haute, Ind.
Milton Rogers & Sons, Omaha, Neb.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
H. Wetter Mfg. Co., Memphis, Tenn.

IMPORTANT ANNOUNCEMENT.

To Our Patrons and the Trade Generally:

Our new Catalogue for 1895 will be ready for distribution within a few weeks. We take this means of announcing in advance of its publication that we have very carefully studied the requirements of the trade in every particular, and that our lines will be complete. We will place on the market specialties in entirely new goods that will commend themselves both by reason of popular prices and their many attractive and desirable features. In addition to our very popular Oilgas Cook Stoves, containing our improved 1895 Burners that are giving such perfect satisfaction, we have something entirely new in the line of special Lamp Stoves at special prices; also Sheet Steel Circular Burner Oil Cook Stoves. Write for further information and prices.

CENTRAL OILGAS STOVE COMPANY,

—Manufacturers of—

Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes.

BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.

One of the many admirers of the L. & H. Process Stoves sends to us the following poem, which we give, as we believe it will be enjoyed by our friends and the trade at large:

"Sweet Marie"

Respectfully dedicated to the Vapor Stove Combination, with apologies to the author of Sweet Marie.

I've a secret to impart, Sweet Marie.
'Tis the same which made the Vapor Pool start, don't you see,
Every dealer in the land knows this secret, knows the brand (L. & H.)
Which causes the Pool to print their bluff, so grand! Holy gee!
When we took their case in hand, Sweet Marie.
There was music without a band—rogues they be;
All their souls are full of fear, full of worry and public leer,
And the dealers listen while we jeer, Sweet Marie.

CHORUS:
On the decline, Vapor Combine,
Vapor Combine, on the decline,
Not because their nerve is less—no, it's sublime,
For their patents are no good
Win their case they never could,
And they wonder how they stood all this time.

One morn the trade did awake, Sweet Marie,
To the blooming Vapor Pool fake, don't you see,
Now every dealer within this border to L. & H. sends his order,
For he'll not be intimidated, no, not he.
When the sunset tints the west, Sweet Marie,
The Vapor Pool will be laid to rest with glee,
And every member beneath the sky from the L. & H. mark will fly,
And if you mention "Vapor Pool" they're shy, Sweet Marie.

CHORUS:
On the decline, Vapor Combine,
Vapor Combine, on the decline,
Not because their nerve is less—no, it's sublime,
For their patents are no good,
Win their case they never could,
And they wonder how they stood all this time.

For further particulars regarding the L. & H. Process Stoves and Gas Ranges address

A. J. LINDEMANN & HOVERSON CO., Milwaukee, Wis.

"GOVERNOR" GASOLINE STOVES "PRINCESS"

We are pleased with the prospects of the coming Gasoline season.

Since the Dealers have seen our Stoves and convinced themselves that we manufacture and carry

The Most Complete Line, the Finest Appearing and Best Working Gasoline Stoves,

Inquiries and orders are pouring in on us. This is very gratifying and at the same time nothing unusual, as the intelligent buyer will at all times avail himself of an opportunity to get the best at the same price.

And we certainly insist that our Gasoline Stove is the best in the Market.

Our Illustrated Catalogue is ready and will be sent on application.

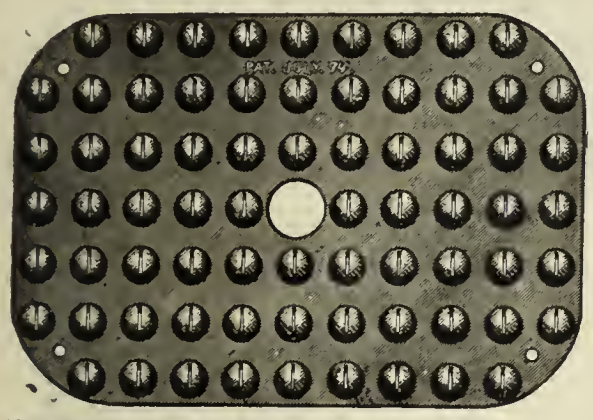
Send for Discount and Secure Territory.

Western Stove & Mfg. Co.
MILWAUKEE, WIS.
CHICAGO OFFICE: Room 73, 88 & 90 Washington Street, T. J. DUFFY, Jr., Sales Agent.



MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.

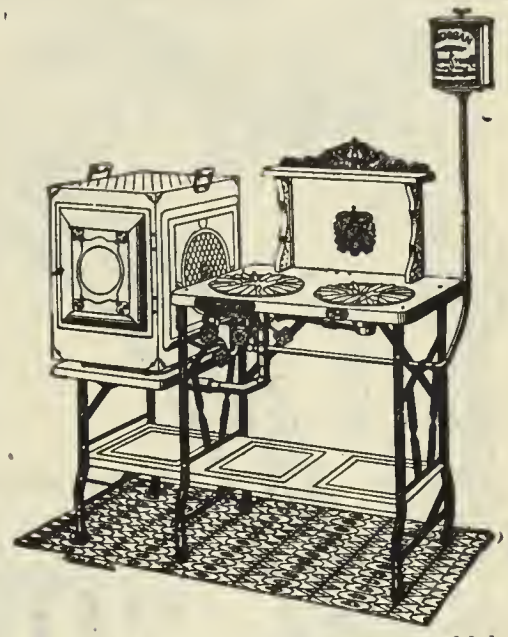
Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*



No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

OUR JET CONE BURNERS distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

and

SPECIAL JUNIORS.

AURORA PROCESS STOVES

Sales in 1894 Doubled.

"AURORA" IS KING.

Brass Cylinders; German Silver Points (Rust Proof); Removable Drip Valves; Sight Feeds; Ornamental High Shelf Brackets; Extra Extension Shelf on all Stoves.



Full line of Hot Generating Stoves and Ranges.

Also Junior Stoves, High and Low, all with Drop Tank.

Fine line of Gas Ranges and Hot Plates.

We defy all Competition on finish, operation and style of "Aurora" stoves.

Send for 1895 Catalogue, now ready.

AURORA VAPOR STOVE CO., CLEVELAND, OHIO.

AGENTS :—THE PERRY STOVE CO., Albany, N. Y. H. W. PEAK, Fort Worth, Tex. JACOB RETTERER, Chicago, Ill. JAS. BEAKEY STOVE CO., St. Louis, Mo JANNEY, SEMPLE & CO., Minneapolis, Minn D. B. BAYLESS STOVE CO., Cincinnati, O. MAHOOD & Co., Philadelphia, Pa.

GARLAND STOVES AND RANGES
The World's Best

I has been said that in America TWO CLASSES of Stoves and Ranges are sold, viz :

"GARLANDS"

—AND—

OTHERS.

At the very head and front of the "Others" stands our new line of

"MICHIGAN" STOVES and RANGES,

Which are unquestionably the latest, handsomest and most artistically-designed Stoves and Ranges to be found upon the market at anything like the price at which they are sold.

They are made under our own supervision; by same workmen and out of the same material from which **"Garlands"** are made, and this fact of itself should be sufficient to cause them to be preferred by discriminating merchants and consumers, as against all other brands, excepting the invincible line of **"Garlands."**

The Michigan Stove Company,

Largest Makers of Stoves and Ranges in the world. . .

DETROIT.
CHICAGO,
BUFFALO,
NEW YORK CITY.

GARLAND STOVES AND RANGES
The World's Best

GARLAND STOVES AND RANGES
The World's Best

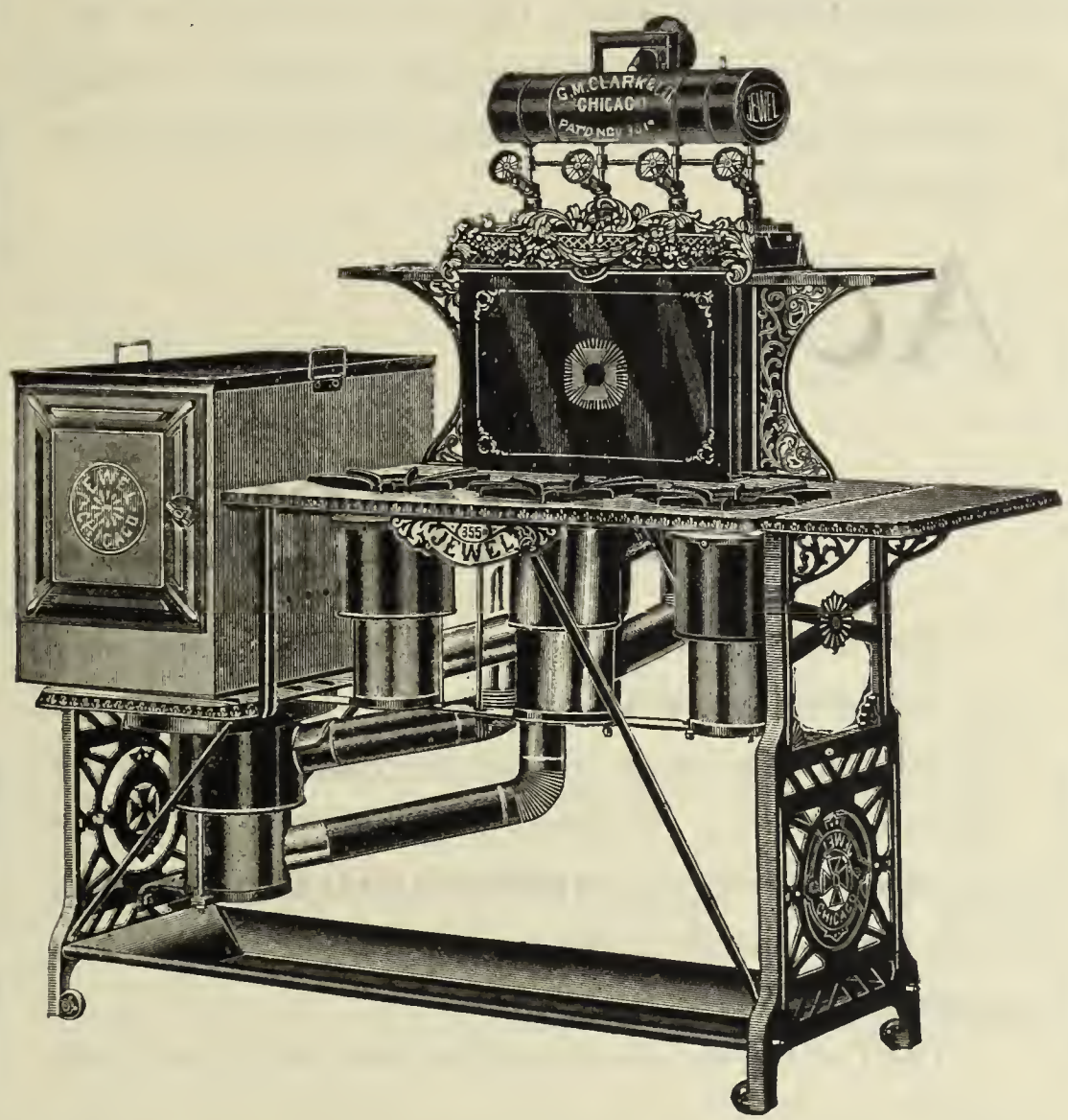
GARLAND STOVES AND RANGES
The World's Best

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

CATALOG READY SOON.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
BARSTOW STOVE CO., New York, N. Y.
W. W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

Have You Decided

Just what ranges you will sell this year? If you are not selling **Acorns** we want to talk with you about them. We can give you convincing evidence that there are no ranges made which will sell so quickly and put so many dollars in your pocket as the

Acorn Ranges.

We can also give you the **reasons** why this is so, show you wherein the **Acorn Ranges** are better, and prove to you that we have many things adapted **to your market** which your customers want. It matters not where you live. We can suit your peculiar wants with **patterns built for your trade,** and at **prices** that will make it an object for you to **buy Acorns.**

Don't let the opportunity pass without finding out about this.

RATHBONE, SARD & CO.,

Albany, N. Y. Chicago, Ills.

Detroit, Mich.

FOUNDRIES:

ALBANY, N. Y. AURORA, ILLS.

DEALERS

EVERYWHERE SHOULD CONSIDER THE FOLLOWING:

THEY CANNOT FAIL TO FIND SUITED TO THEIR TRADE,

Gasoline Stoves, Oil Cooking Stoves,
Oil Heating Stoves, Lamp Stoves,
and Gas Hot Plate Stoves,

Together with Full Lines of Ovens and Furniture

In the following Large Assortment of First-Class, Popular and Reliable Goods we are offering

"AURORA" Process Gasoline Stoves.

"ARGAND" Improved Junior Lines, High, Low and Step Gasoline Stoves.

"ROYAL" Round Wick, High and Low, Oil Cookers, with new and desirable features.

"ROYAL" Flat Wick, all Cast, Nickel Finish, Oil Cookers.

The Largest Line at Low Prices on the Market.

"ROYAL" Lamp Stoves, One, Two and Three Burner. Polished Nickel Finish, Sheet Iron Chimneys, Brass Burners.

"JOCKEY" Lamp Stoves, One, Two and Three Burner. Japan and Bronze Finish, Tin Chimneys, Cast Burners.

"SHOO-FLY" Lamp Stoves, One, Two and Three Burner. Japan Finish, Tin Chimneys, Tin Burners.

"SHOO-FLY" Double Lamp Stoves, with Two and Four Hole Extension Tops. Mounted on Highly Ornamental Base, Finished in Polished Nickel and in Japan.

All our "Shoo-Flys" are great sellers.

GAS HOT PLATE STOVES.

Full Nickel, White Nickel and Plain Finish.

"CHAMPION" Two and Three Burner. Special New Line, 1895. Large, Smooth Top Surface, something entirely new, stands high, and has our Removable Burner and Air Adjuster. The most common sense stove ever made.

"MAGIC" Two and Three Burner. Special New Line, 1895. Popular priced, Large Flush Top Surface, stands high, has Double Burner and Air Adjuster.

"ARGAND" One Two and Three Burner. Flush Top, Double Removable Burners, Beautiful Design.

"FIRE-FLY" One, Two and Three Burner. Flush Top, Double Removable Burners, Popular Priced and a great seller.

Also New Line "ROYAL" Oil Heaters.

With such an assortment of First-Class, Popular and Reliable Goods to select from we believe it will pay you to see us before buying elsewhere.

THE PERRY STOVE CO.,

ALBANY, N. Y. **242 Water St., New York City.**

Announcement of

An Important Meeting to take place at Offices of

The Ferrosteel Company,

Wade Building, Cleveland, Ohio,

Monday, February 4th, 1895—And following days.

This meeting is one of orders and inquiries for Ferrosteel Ranges that will be received. Also applications for agencies. Orders from traveling representatives, too. Will your order, inquiry or agency application be received with others? It's the style now to handle Ranges made of Ferrosteel. New sizes for 1895 Spring trade.

THE

Warren Steel Range.

IMPORTANT ANNOUNCEMENT.

To Jobbers and Retailers of Steel Ranges:

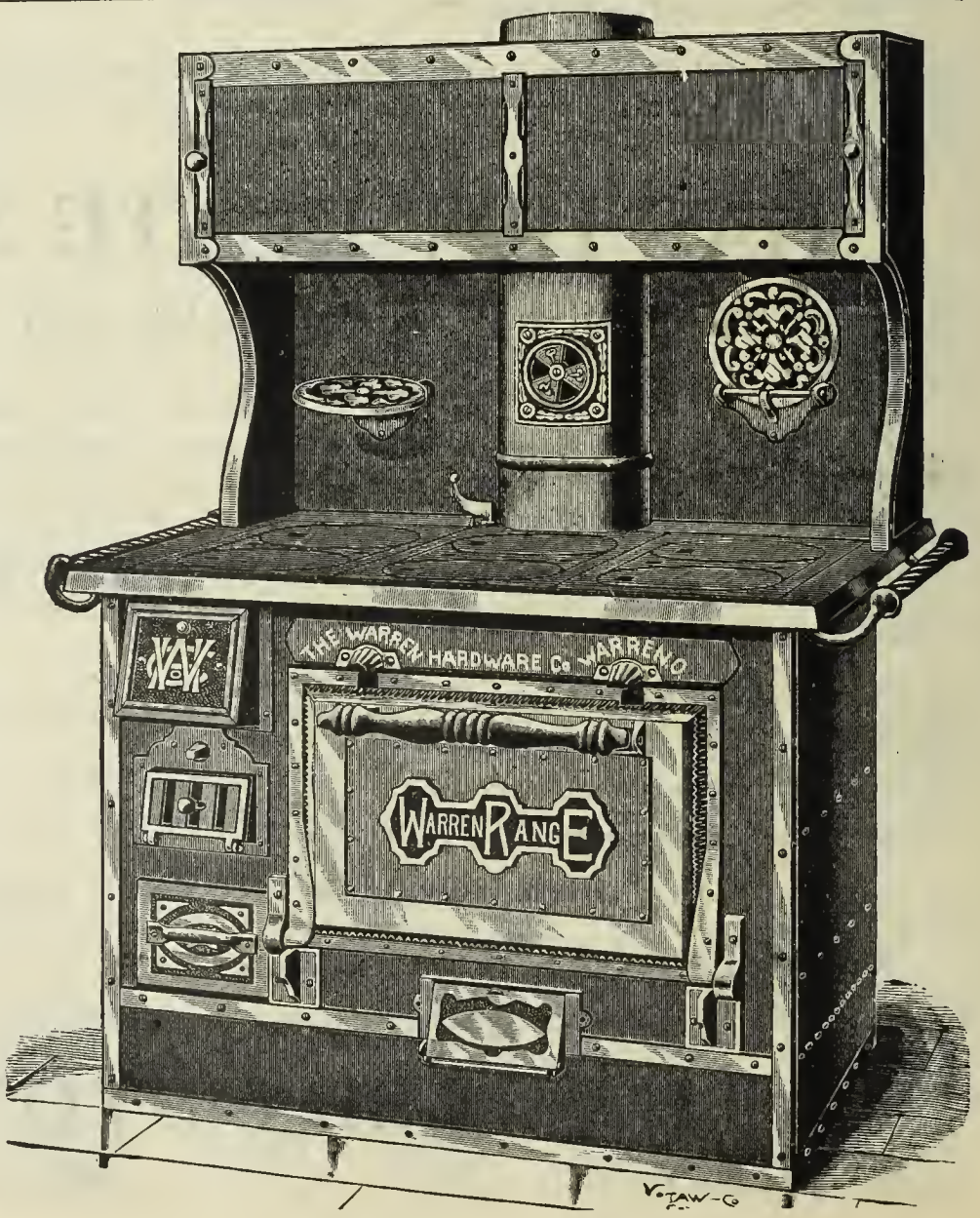
Don't fail before placing your order for Steel Ranges to get catalogue and prices on our new line of Warren Ranges for 1895. New and original and the finest line of Ranges on the market. With Duplex Grate to draw out front of range without disturbing fire linings. Full size opening of oven 18 x 20 x 14, 20 x 22 x 14 and 22 x 23 x 14. Lined throughout with asbestos. Write for prices and catalogue.

MANUFACTURED BY

THE WARREN HARDWARE CO.

7 Market Street,

WARREN, OHIO.



Taplin, Rice & Company,

—Manufacturers.—

DICTATED BY P. **Akron, Ohio,** January 29, 1895.

BY THIS we beg to call the attention of the trade to the fact that during the current year we will be on the market with several new patterns of Steel Ranges and Heating Stoves, of superior construction, ornamentation and attractive form, the patterns of which are well under way and will soon be ready for the sand. The Climax Steel Range, which will be made in all the various conventional forms and styles, will be both as to construction and appearance second to none on the market. We will also have ready for the trade in due time a "Climax Air Blast" and "Climax Air Tight" heating stove in different sizes, the constructive features of which will be a radical departure from any pattern of stove ever offered, and we feel well assured they will wherever introduced take a leading position in the line of special heaters. Cuts and prices of these Ranges and Stoves will be mailed on application at an early date, and we are confident you will feel justified in deferring your order for supplies until samples or cuts of stoves named may reach you.

With grateful appreciation of former courteous favors shown us by the trade, we remain,

Very respectfully,

TAPLIN, RICE & CO.

Northern Queen



COAL RANGE,

WITH FLUSH RESERVOIR.

The par-excellence of range construction. A more desirable one or one that sells more readily or a better production has never been offered the trade. Its many features of excellence are so numerous that space will not permit of repetition. Will you not write us for catalogue and prices and thus obtain the full particulars?

The Portsmouth Stove & Range Company,

—MAKERS,—

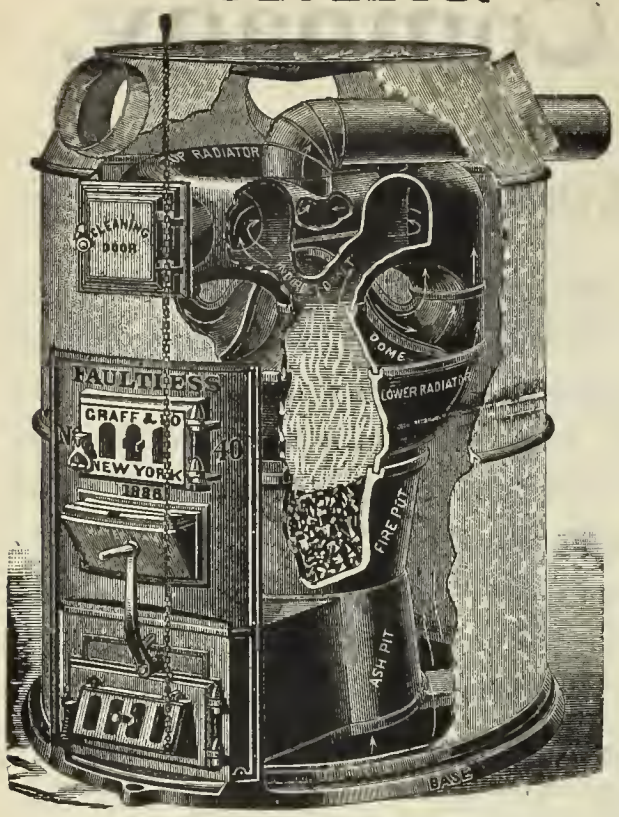
Portsmouth, Ohio.

AGENTS:

R. ROBINSON & SONS, Chicago, for the Northwest.
A. L. CANFIELD, 284 Pearl Street, New York, for New England States.
C. F. HAKE & SONS, for Cincinnati and Vicinity.
HOME STOVE CO., Indianapolis, Ind.
W. E. ANTHONY & Co., Detroit, Mich.; Mich. and Minn.
BRADLEY, MUNK & Co., Columbus, Ohio.

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.

FAULTLESS.



SUPERIOR GOODS.

FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.
HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.

Faultless, Elegant and Columbian Ranges.

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.

Oppor= tunities may have been neglected in the past,

but it is certainly to your interests to let us show you all about the .....

Triumph Heaters

Excellent profits and inducements. Satisfaction is guaranteed in handling

THE DEALERS' BEST LINE.

The Triumph Special,
for hard coal. 5 sizes.
The Triumph all Cast,
hard or soft coal. 5 sizes.
The Triumph King,
hard or soft coal. 4 sizes.
The Triumph Steel,
hard coal. 5 sizes.
The Triumph Air Blast,
soft coal. 5 sizes.
The Triumph Combination
for hot water and air. 5 sizes.

WESTERN BRANCH:
GEO. D. HOFFMAN, Mgr.,
82 Lake St., Chicago, Ill.

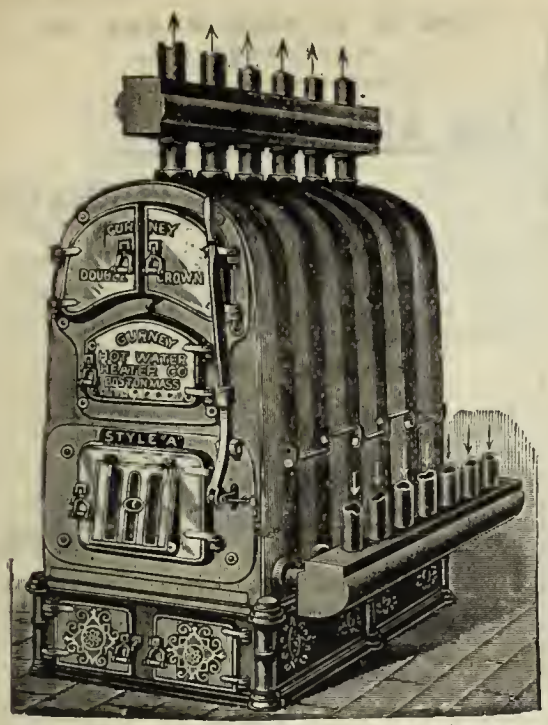


WRITE US FOR
The 1895 Catalogue of the Triumph Heaters,
OR
The Principles of Heating and Ventilation,
with Facts and Figures,
OR
The Picture Book,
OR
The Triumph Estimate Book,
all published for the use of the trade.

Prices, Discounts and full information on application to

The Craig-Reynolds F'd'y Co.,
DAYTON OHIO.

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



Gurney "Double Crown" Hot water Heater.
Style "A."

RESULTS ARE CONVINCING EVIDENCE.

THE GREAT SUCCESS WHICH

Gurney

HOT WATER HEATERS,
STEAM BOILERS
RADIATORS,

Have attained is due to the **FACT** that they embody

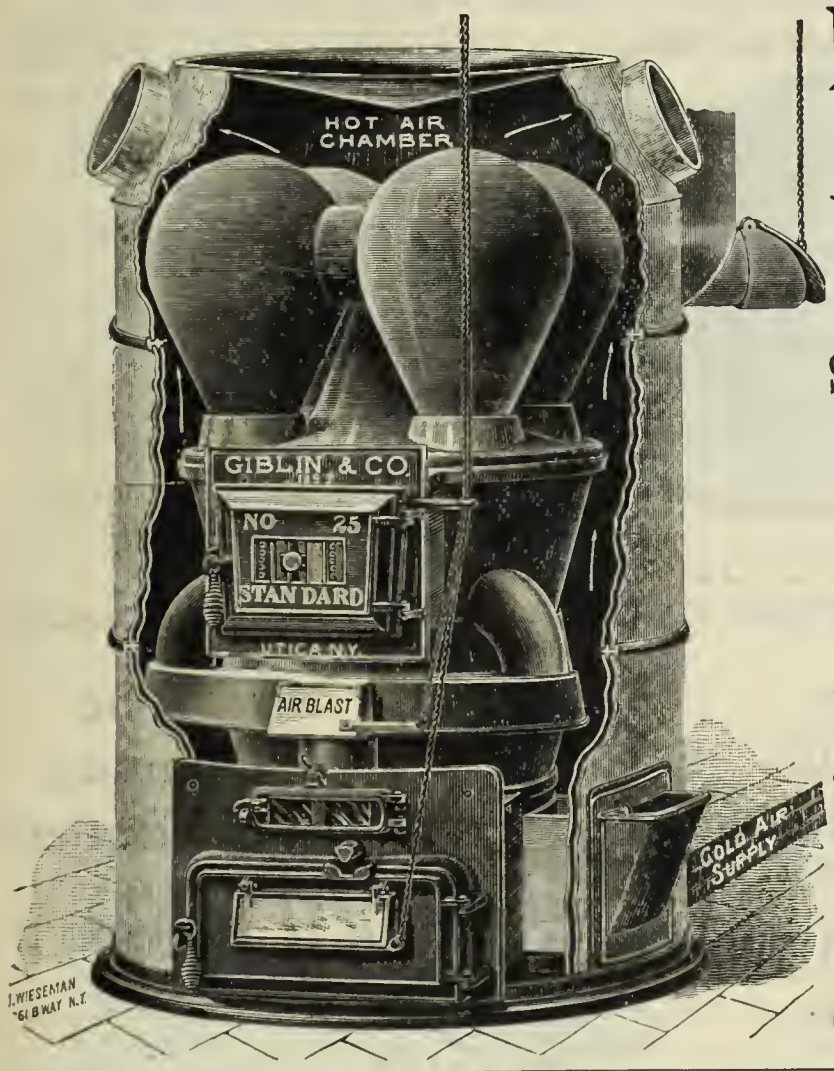
BEST

WORKMANSHIP,
CONSTRUCTION,
MATERIALS,
ADAPTABILITY,
IDEAS.

ALWAYS EQUAL TO THE OCCASION.

Send for Catalogues. Sold only to the Trade. **GURNEY HEATER MFG. CO.,** 163 Franklin St. Cor. Congress, Boston, Mass.

Selling Agents, A. A. Griffing Iron Co., 34 Dearborn St., Chicago, Western States.



No Need of FURTHER EXPERIMENTS.

We Have Solved the Problem.

THE STANDARD SMOKELESS FURNACE
—IS—
The Best

No Smoke. No Gas. No Dust.

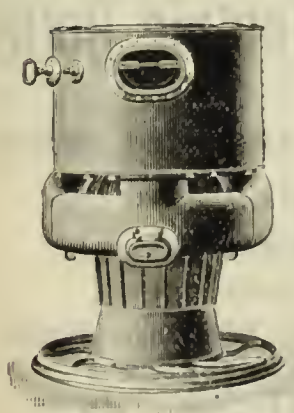
TEN YEARS AHEAD OF ALL OTHERS.

IF YOU ARE SELLING SOFT COAL FURNACES

THINK CAREFULLY—DECIDE WISELY.

GIBLIN & CO., UTICA, N. Y.

OXFORD PERFECT BLAST FURNACES.



—CONSTRUCTED WITH A—

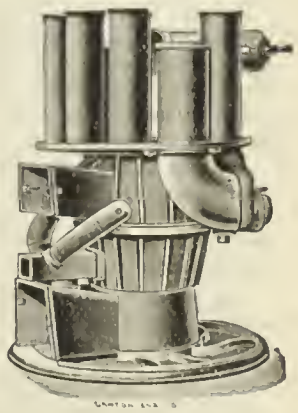
POSITIVE WORKING AIR BLAST

—AND—

UTILIZING INDIRECT CURRENTS

TO INCREASE HEATING CAPACITY.

SEND FOR NEW CATALOGUE.

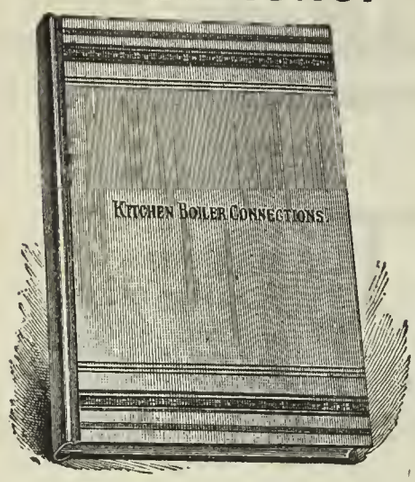


THE J. H. McLAIN COMPANY, Canton, Ohio.

NEW YORK, 69 Centre Street. CHICAGO, 88 Lake Street. DENVER, 1525 Champa Street, SAN FRANCISCO, 5 Crocker Bld'g.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth,

Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

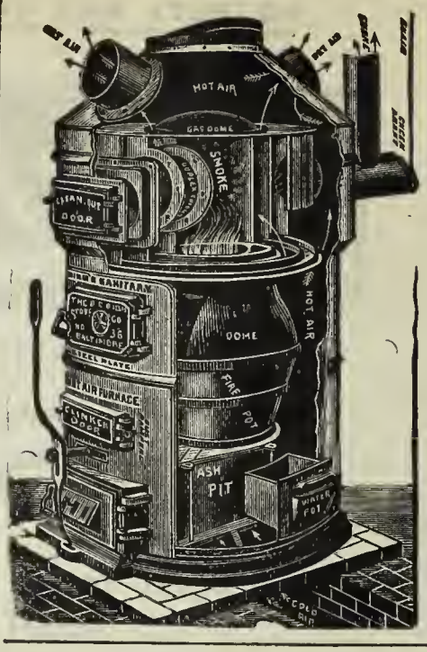
Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE

Portable, 5 Sizes; Brick Set, 2 Sizes

The arrangement for shaking and dumping the grate surpasses all others—no opening of door necessary; also

BIBB'S ORIGINAL

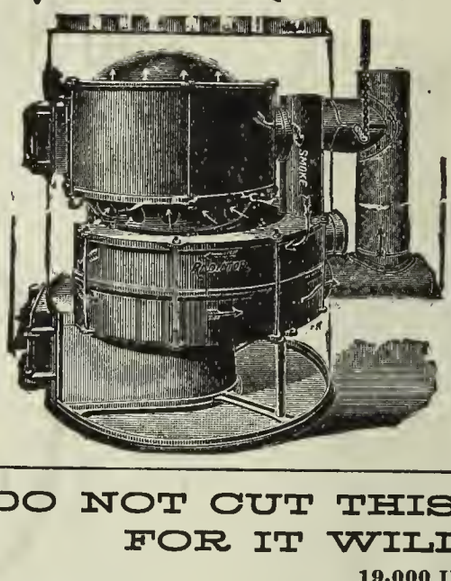
Baltimore Fire Place Heaters

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.

DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

IT IS A GREAT ECONOMIZER OF FUEL.

IT IS A LOW FURNACE.

ELMIRA, N. Y., January 15, 1895.

Gentlemen: I am pleased to have the privilege to testify as to the merits of your Victor Warm Air Furnace. This is the second season I have used it, and it gives perfect satisfaction in every respect. It Heats 4 large rooms down stairs and 3 sleeping rooms up stairs, and my monthly average of coal consumed is only one ton; I used 4 stoves to warm the same apartments before, with the average of two tons per month. Your great advantage over other Furnaces is your Base Burner Attachment that economizes all of the heat so that none escapes to the chimney. I am willing to speak a good word for the Victor at any time. Yours truly, R. N. PARMENTER. 118 West Water St., Elmira, N. Y.

Agents wanted. Address

THE CORNING MANUFACTURING CO.,
Corning, N. Y.

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best

—FOR—

Steam or Hot Water Heating.

—o—

Send for Catalogue.



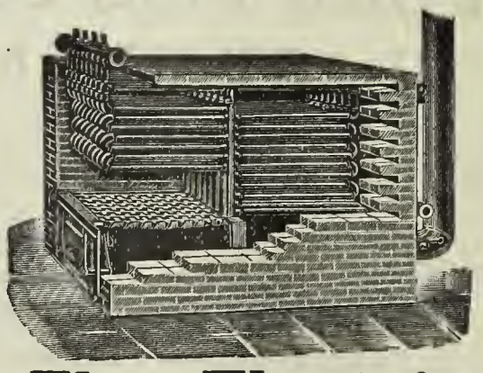
The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

Packed Joints.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

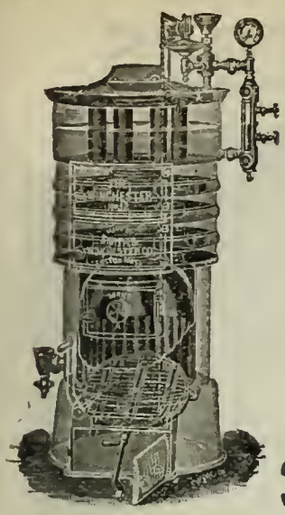
Over 300 Different Sizes.

SEND FOR CATALOGUE TO

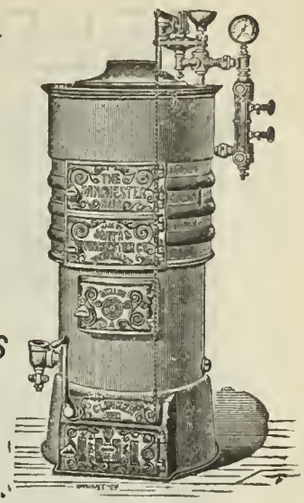
The Electric Boiler Co.,

23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST.,
ROCHESTER, N. Y.

New York Office, 44 Dey Street.



The Winchester



Has more ***COMMENDABLE***

And less ***OBJECTIONABLE FEATURES***

Than any Heater on the Market,

——MADE BY——

SMITH & WINCHESTER CO., Boston. Mass.

Our prices on these Heaters will please you. Send for them

ROYAL HEATERS

SOLD ON THEIR MERITS. NOT ON THEIR ANTIQUITY.

HOT WATER. STEAM. HOT AIR. COMBINATION.

LARGEST ASSORTMENT OF STYLES AND SIZES.

CATALOGUES GIVE FULL DESCRIPTION.

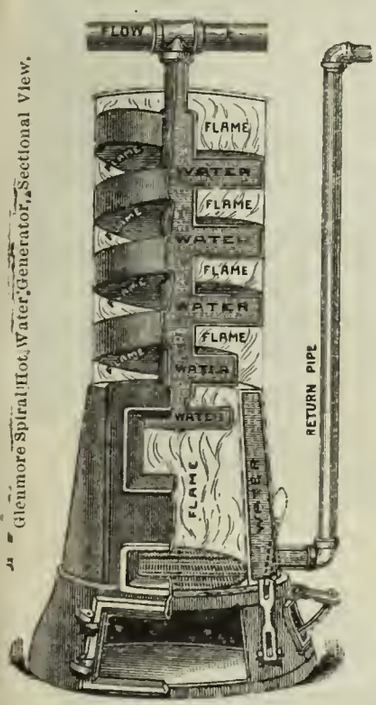
CORRESPONDENCE SOLICITED.

MANUFACTURED BY

HART & CROUSE.

UTICA, N.Y.

NEW YORK. 211 WATER ST. CHICAGO. 79 LAKE ST.



Glenmore Spiral Hot Water Generator, Sectional View.

THE GLENMORE

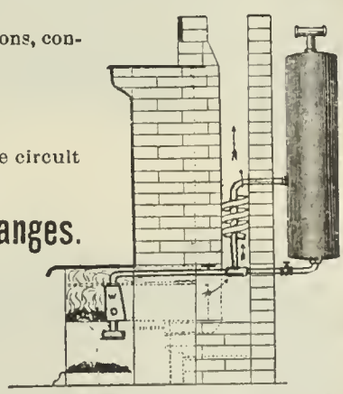
Spiral Hot Water Generator.

(PATENTED.)

For General Heating Purposes, but Especially Adapted to House Heating.

COMMENDATORY POINTS:

Simple construction. Practically composed of two sections, consequently few joints and nothing to give out.
Large heating surfaces.
Products of combustion fully utilized.
Instantaneous generation of hot water.
Free and easy circulation.
Easily cleaned fire surfaces.
Hot water may be drawn off at any point along the pipe circuit without materially affecting the heating service.
Grate conducive to economy in fuel.



Spiral Water Back Attachment for Kitchen Ranges.

Spiral Water Back Attachment for Kitchen Ranges.

By utilizing waste heat, this water back extends the capacity of a kitchen boiler, and makes it a valuable heating auxiliary, especially in spring and fall, when the regular heating apparatus is too powerful.

☞Send for Pamphlet.

GLENMORE FOUNDRY AND MACHINE CO., 73d ST. and WOODLAND AVE., PHILADELPHIA, PA.

SECURE AGENCY EARLY.

Send for Catalogue without delay.

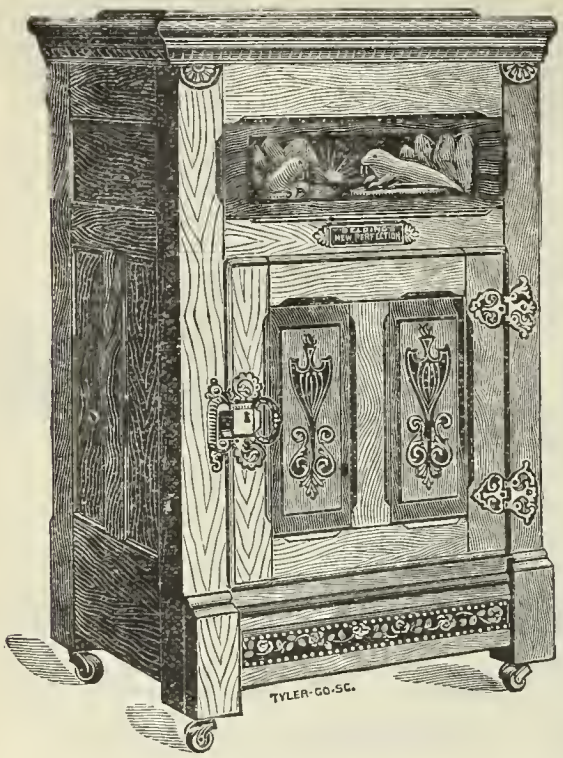
The Plummer Steam Heater.

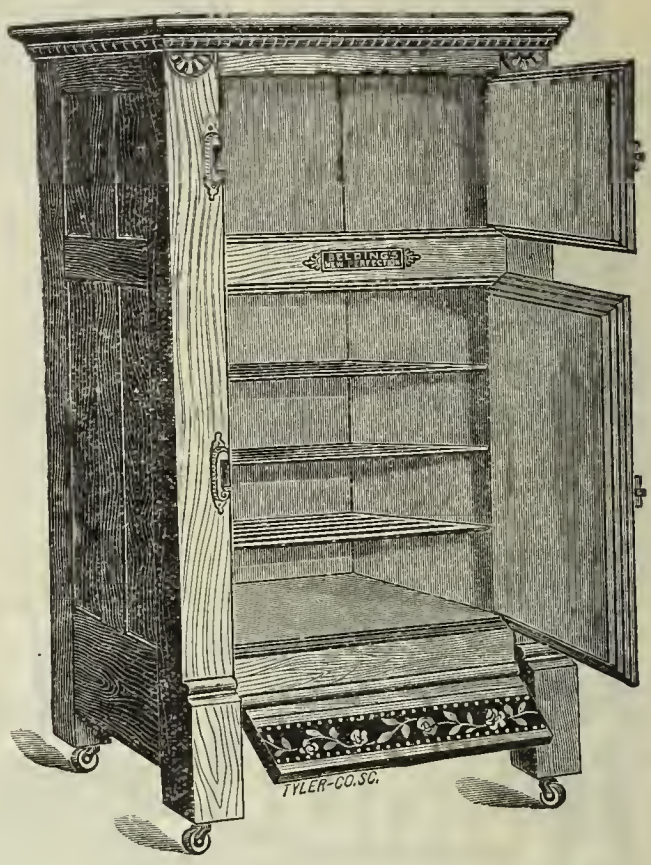
12th SEASON, BUT "UP TO DATE."

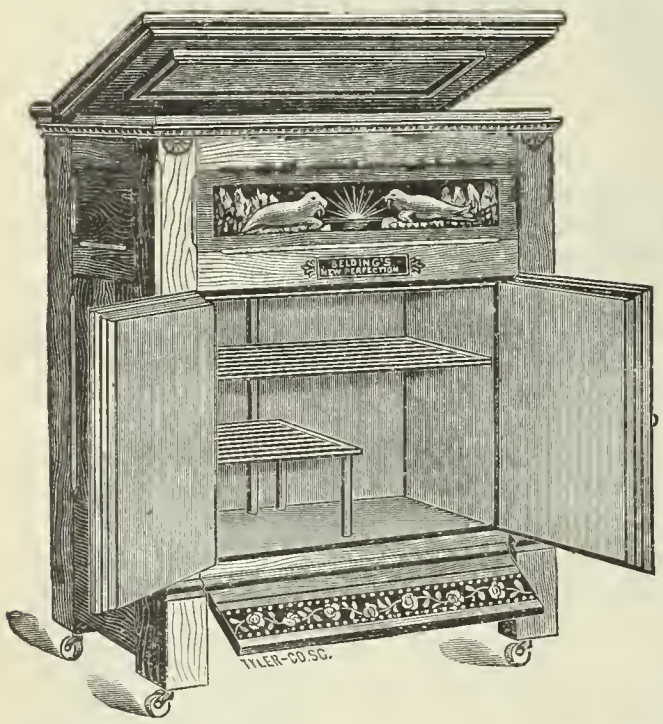
The Leader Hot Water Heater

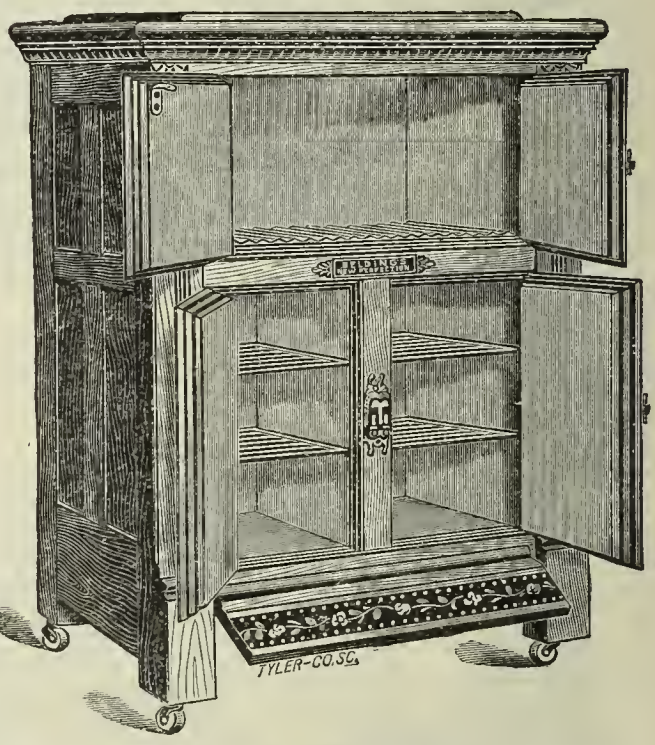
PUTNAM FOUNDRY & MACHINE CORPORATION, - PUTNAM, CONN.

BELDING'S REFRIGERATORS.

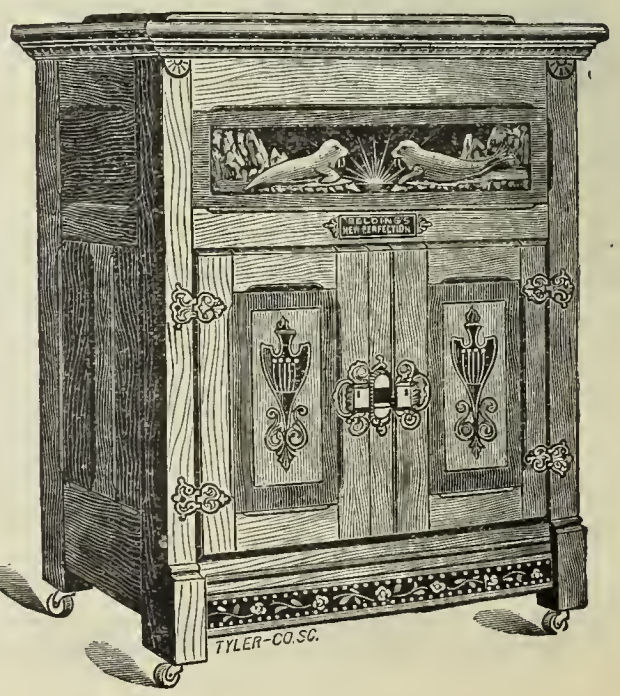




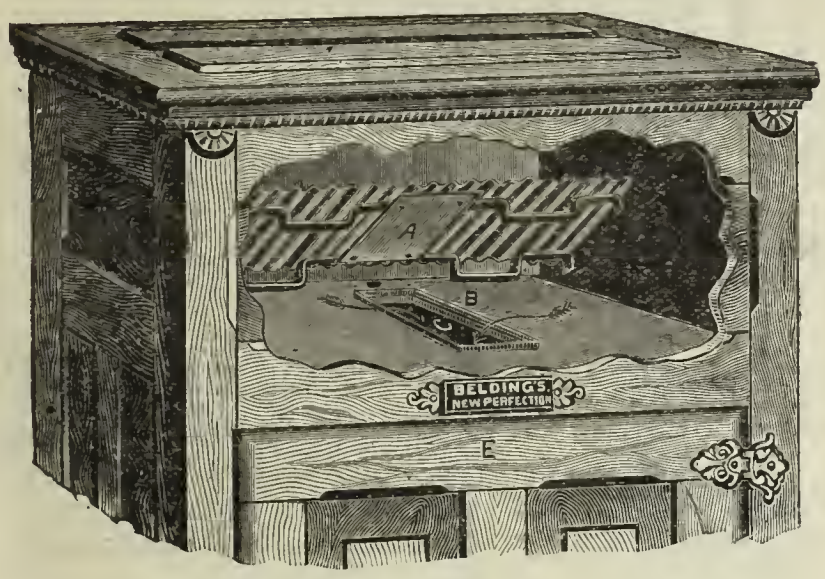




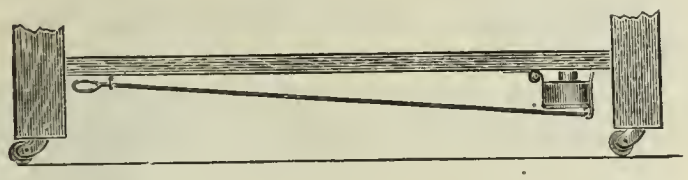


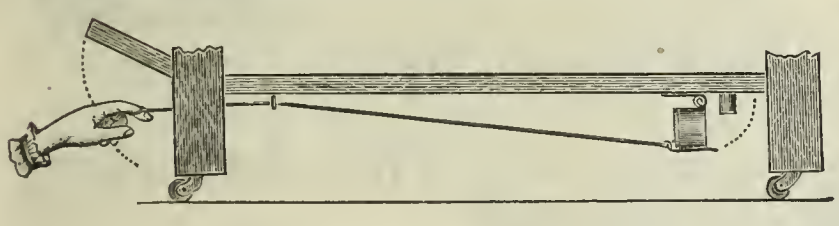


See Points of Excellence Over Others.



Patent Applied For.





OUR NEW AUTOMATIC COLD AIR DAMPER ATTACHMENTS.

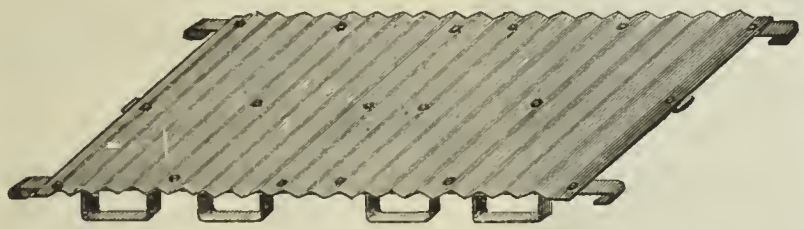
This cut shows a section of our Refrigerator with the New Automatic Cold Air Damper closed.

A—Represents Metal Ice Rack.
B—Bottom of Ice Compartment.
D—The **New Automatic Cold Air Damper.**
E—Door of Provision Chamber.

When the door of the Provision Chamber is opened the Cold Air Damper *immediately* closes the opening through which the cold air drops, thereby *instantly stopping the circulation* in the Refrigerator. Then, as the cold air in the Ice Compartment *cannot escape*, it is impossible for warm air to enter it through the flues in the sides of the Refrigerator; therefore, while the door of the Provision Chamber is open *no ice is wasted, no cold air escapes* and *no warm air enters* the Ice Compartment or *comes in contact with the ice.*

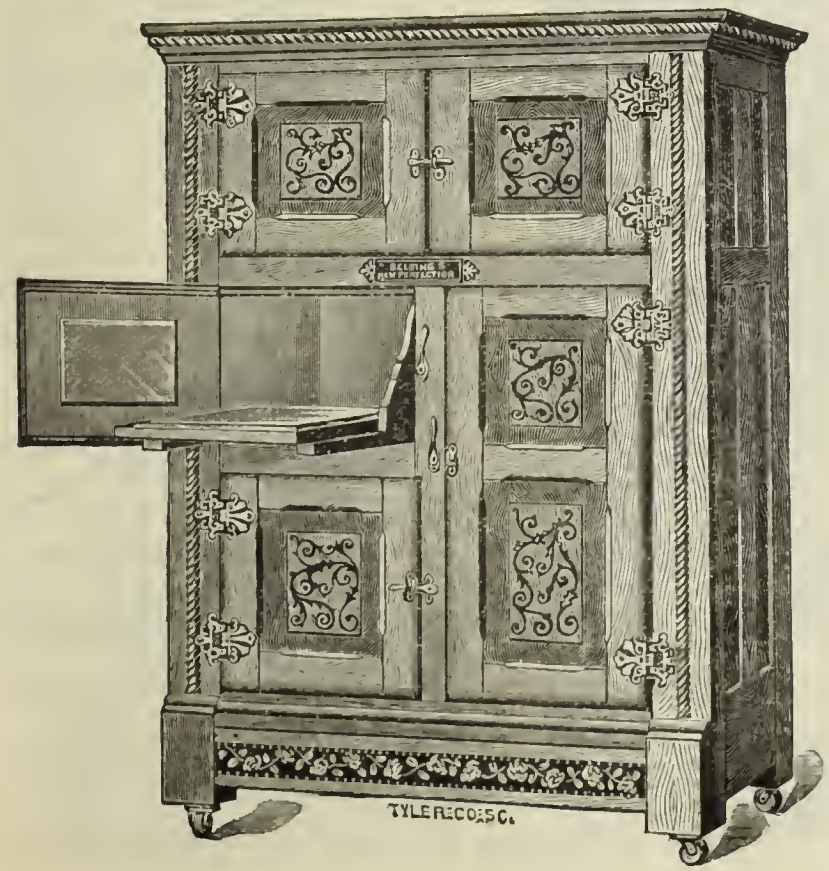
Thus it is clearly shown that this improvement is a *practical* one and makes our Refrigerators *consume less ice* than any that are now on the market.

OUR NEW DRIP CUP ATTACHMENT.



SOLID METAL ICE RACK.

No wood cleats to get water soaked and tainted.



All refrigerators **hardwood, antique finish.** We carry large stocks at all of the following places:

Belding Manufacturing Company.

Factories, Belding, Mich.

SALESROOMS AND WAREHOUSES:

Chicago, 223 5th Avenue.
New York, 260 Canal Street.
Philadelphia, 249 So. 2nd Street.
Boston, 90 Canal Street.
Holbrook, Merrill & Stetson, San Francisco and Sacramento, Cal., Pacific Coast Agents.

SEND FOR ILLUSTRATED CATALOGUE.



We Take This Opportunity

Of reminding you that we are still

ON TOP!

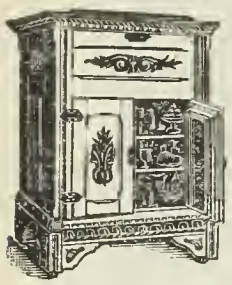
OUR GOODS EXCEL!

OUR PRICES SUIT!

We Deal with the Trade Only.

American Boiler Company

94 Centre St., New York. **84 Lake St., Chicago.**



No. 21.

The Gurney Patent Refrigerator

is the BEST SELLER, gives the BEST SATISFACTION and PROFIT to the dealer of any refrigerator on the market BECAUSE—It has special FEATURES, "TALKING POINTS," SELLING POINTS, not found in other refrigerators.

1. By the use of a ***Removable Galvanized Ice Compartment*** the ***"Gurney"*** can be cleaned. This feature alone assures its sale.

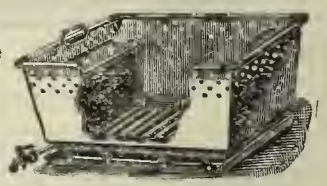
2. Under the ***"Gurney"*** principles of construction the ***lowest*** average temperature is reached with the ***greatest economy of ice,*** as fully explained in our catalogue.

3. In the ***"Gurney"*** the ice does not come in contact with the zinc side walls, thus preventing condensation or "sweating" on the inside linings, an important feature of cleanliness and durability.

4. It is packed with Mineral Wool (the best non-conductor known).

5. It has the freest circulation and dryest air, there being a large space around the four side walls of the ice compartment, thus giving about six times the condensing surface of any refrigerator.

6. In style and finish it leads all competitors.



Removable Galvanized Ice Compartment.

Send for Illustrated Catalogue and secure Agency.

GURNEY REFRIGERATOR CO., Fond du Lac, Wis.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE

THE BEST IN THE WORLD!

OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

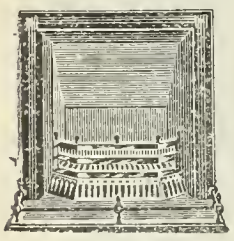
At LOWEST PRICES EVER KNOWN.

If your dealer does not have them, Send for Illustrated Circular and Price-List, to

JOS. W. WAYNE,

MANUFACTURER,

124 MAIN STREET, CINCINNATI, O.



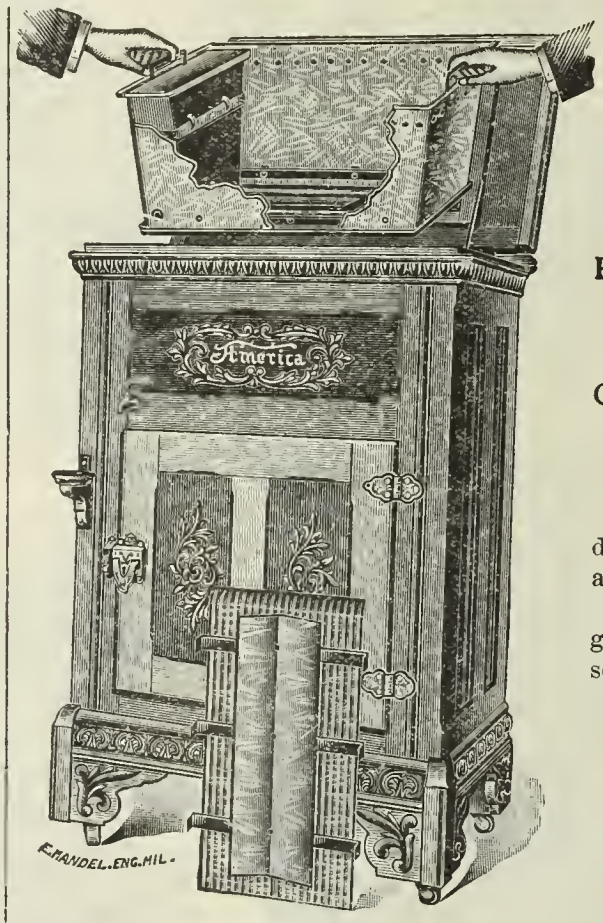
Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.





The America!

GEM OF

REFRIGERATORS.

Patented Removable Ice Compartment.

Can be kept clean with the least trouble.

Its construction for cleanliness, drainage of waste water, circulation and insulation is perfect.

Write for catalogue and investigate our claims. It will pay you to secure the agency in your town.

THE

Bowen Manufacturing Co.,

FOND DU LAC, WIS.



WHY IS IT

that the same dealers who sold the **Boomer Furnace** five years ago are still continuing its sale?

DID YOU EVER STOP TO THINK

that one or two years' experience with a poorly constructed light furnace always creates a demand for a furnace that has proven to be the best in the full sense of the word?

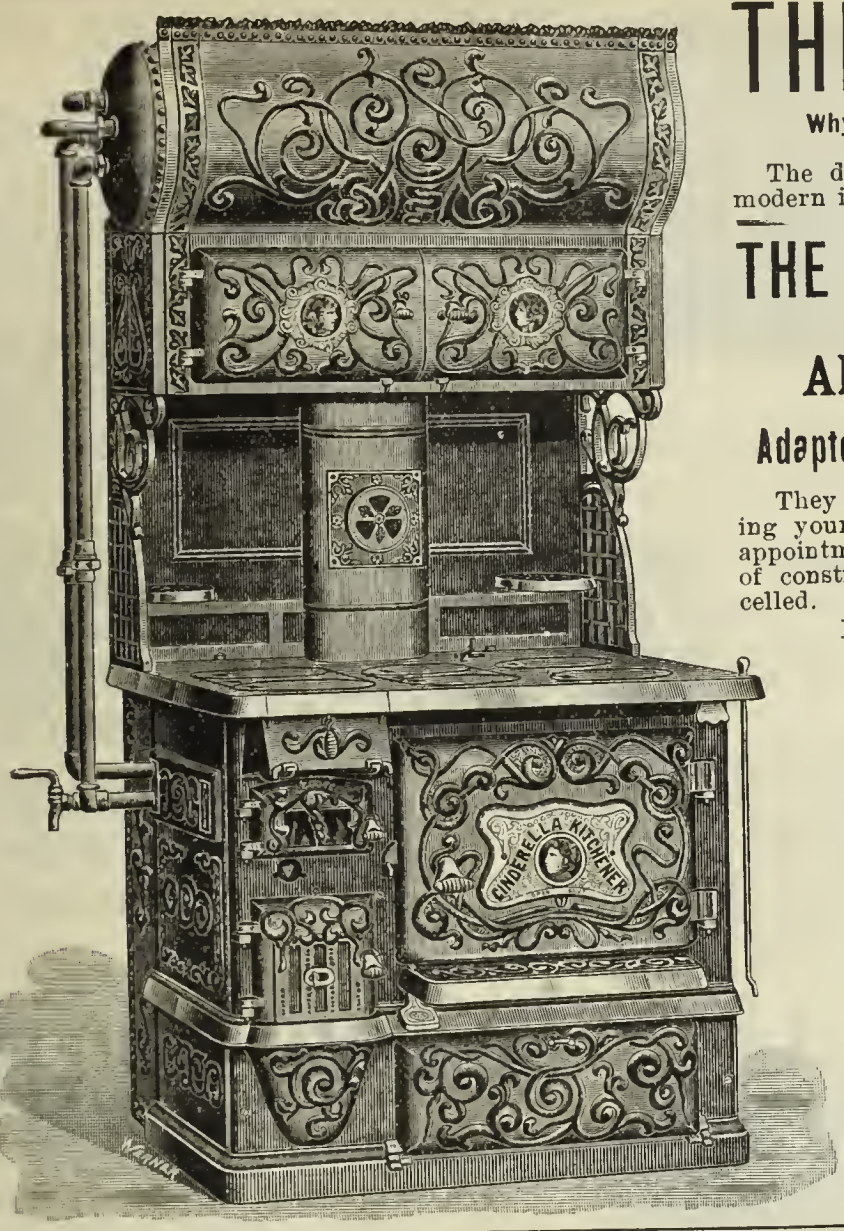
IF YOU WANT TO MAKE MONEY

buy the Improved Boomer Furnace, set it up right, please your customer, and you have the key to your future success.

REMEMBER

that a Boomer Fire Pot has never been known to crack or burn out. That it has the simplest and most effective Gas and Smoke Burner. Guaranteed the heaviest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS. Massillon, Ohio.



THERE IS A REASON

Why some dealers are more successful than others.

The dealer who studies the wants of his trade, adopts modern ideas, is the successful man of to-day.

THE CINDERELLA KITCHENERS

ARE AN ENTIRELY NEW LINE OF

ALL CAST IRON RANGES,

Adapted for burning Hard or Soft Coal or Wood.

They are made in a variety of styles, with a view of meeting your local requirements. They are complete in every appointment, and are "up-to-date" goods that for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No. 716,	Oven 16 x 16,	10½	inches high.
718,	18 x 18,	11½	"
818,	18 x 18,	11½	"
719,	18 x 20,	12½	"
819,	18 x 20,	12½	"
821,	20 x 22,	13½	"
921,	20 x 22,	13½	"

If you are interested write for prices.

We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

We would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited,

PITTSBURGH.



Simplest, Safest, Best.

Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

139, 141 and 143 CENTRE STREET, - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student, and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

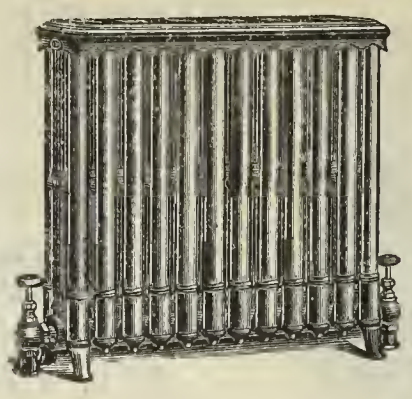
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



Union Radiator.

THE H. B. SMITH CO.

Manufacturers of STEAM AND WATER

Heating Apparatus,

For Public and Private Residences.

SPECIALTIES:

THE UNION AND ROYAL UNION HOT-WATER RADIATORS.

GOLD'S IMPROVED SECTIONAL BOILERS

MILL'S SAFETY SECTIONAL BOILERS.

REED'S IMPROVED CAST IRON RADIATORS

GOLD'S INDIRECT PIN RADIATORS.

BRECKENRIDGE'S PATENT AUTOMATIC AIR VALVES.

Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for Hard or Soft Coal.

Office and Warerooms: 137 Centre St., New York.

Catalogues sent on application. Foundry, Westfield, Mass.

STEAM HOT WATER WARM AIR

FOR HEATING ALL CLASSES OF BUILDINGS

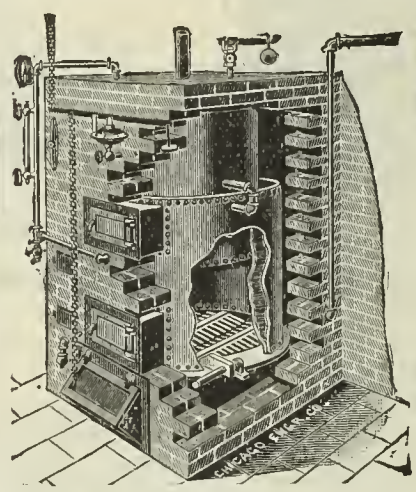
OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

CAPITOL HEATERS

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use **HARD or SOFT COAL.**

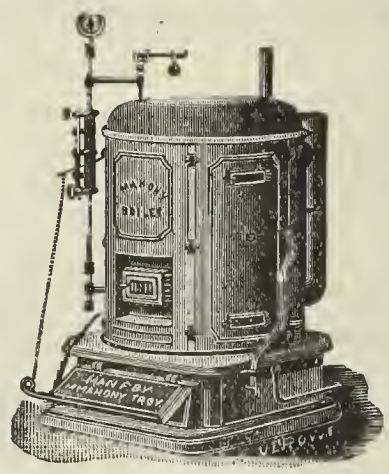
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



THE MAHONY BOILERS.

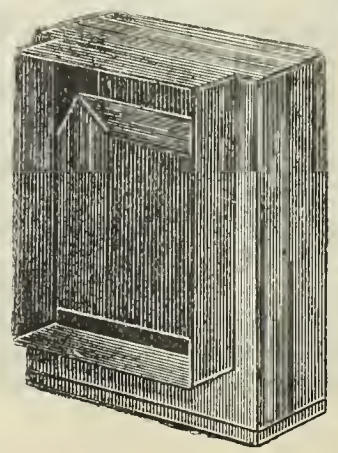
For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



Novelty Ventilated Wall Pipe,

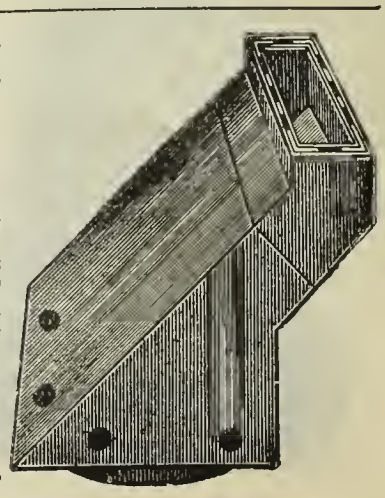
Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER.

18 Wood Street, Pittsburgh, Pa.



DEALERS!

All Weak Points About Vapor Stoves

are not called to your attention by unscrupulous manufacturers or their salesmen. They often palm off imperfect and faulty stoves as perfect, and jolly you into the belief that you have struck a bargain.

But when summer comes and truth comes to light, as it invariably does in the vapor stove business, vexation and disappointment come with it. Vexation, because you have been duped, disappointment, on account of the loss of a season's profit.

Better handle a *good line* at a fair profit than a *poor* line at a *bargain* profit. There is no such thing as a "bargain," especially in the vapor stove business. *Proof*—Review the past???

Better buy from a responsible manufacturer or his legitimate jobber, especially of one whose integrity is unquestioned, and one whose knowledge of the vapor stove business secures you an honest deal and prevents the imposition of fakes or shoddy goods. *There are a few of us left.*

Better buy a good line to be successful. A *bad* stove is a very poor purchase at *any* price.

Better look for Protection.

Protection in order to be of service to you must begin at home. See that this point is not overlooked when casting about for a line for 1895.

Better think this over.

The old adage reads, "Make Haste *Slowly*." This is a weighty proverb. The more so when you consider that the best versed manufacturers in the vapor stove industry are not offering any new inventions or innovations for the coming season.

Yours respectfully,

THE SCHNEIDER & TRENKAMP CO.,

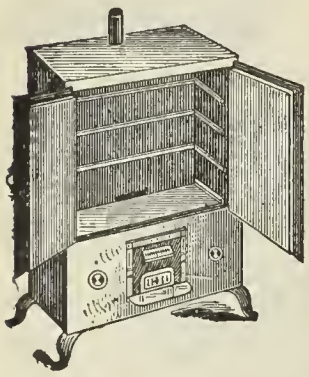
479-501 Case Ave., Cleveland, O. 67-69 Lake St., Chicago, Ill.

Jobbers Who Will Handle the Reliable for 1895.

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas and Oklahoma Territory.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
AGI NAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
[illegible] F. FOX Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North & West Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.
S. FAITH & CO., Philadelphia, Pa.—Eastern Pennsylvania and New Jersey.
HUNNICUTT & BELLINGRATH, Atlanta, Ga., and Vicinity.

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



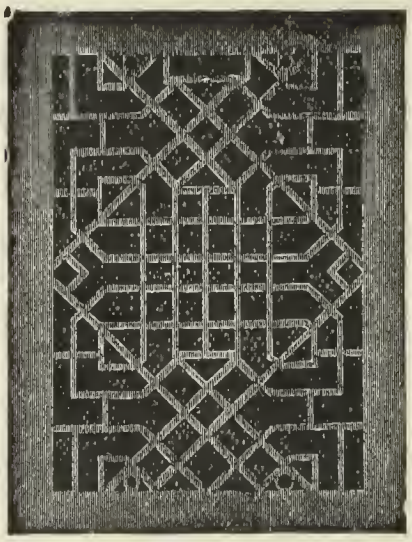
Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.
Burlington, Vt.



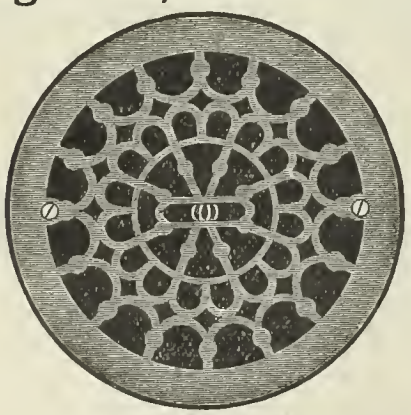
Warm-Air Registers, Ventilators Etc. Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers, Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.

TUTTLE & BAILEY MFG. CO.,

REGISTERS, VENTILATORS, &c.



PERSIAN DESIGN.

REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.

THAT'S WHAT THEY SAID—

"Cold snap? We hadn't noticed it particularly—kept warm enough at our house."

THEY WERE USERS OF THE

"Mowry-Page" Boiler,

This well satisfied lot of people. Many fitters were fortunate enough to have them among their customers—were **YOU?** Our new agency list is open for '95-'96: shall we put your name at the head of it? Experience must have shown you that it pays to please your trade, and we can help you do it.

Better have our catalogue by you anyway—it's a good investment and costs you nothing.

W. C. MOWRY, Lock Box 314, Norwich, Ct.

THE VOLUNTEER

STEAM



For hot water or steam has no superior, and is the only hot water boiler that is **SELF REGULATING.**

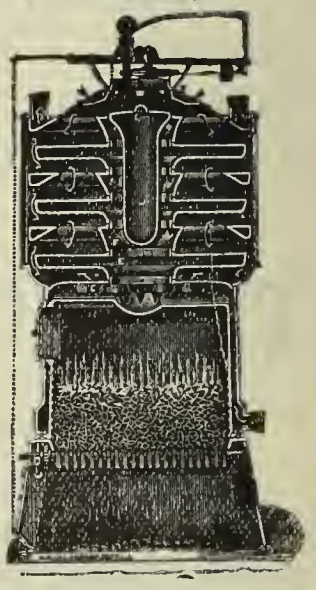
Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Street.

SECTIONAL VIEW, Hot Water.



THE ART OF SELLING.

By F. B. GODDARD. 12mo, Flexible Cloth, 50 Cents.

In this book the author lets the reader into the secrets of the accomplished and successful salesman, illustrates his tact and finesse, and tells how he masters men: but beyond this, the work embraces much information which will be instructive and useful to all classes of business men. Besides suggestions to buyers, it contains chapters on "Changes in Business Conditions and Methods." "Salesmen's Compensation." "Retail Merchants and Salesmen," "Saleswomen, "How to Read Character," with a collection of clearly and tersely put important Legal Principles and Decisions Governing Sales. Sent, post-paid, upon receipt of price, by

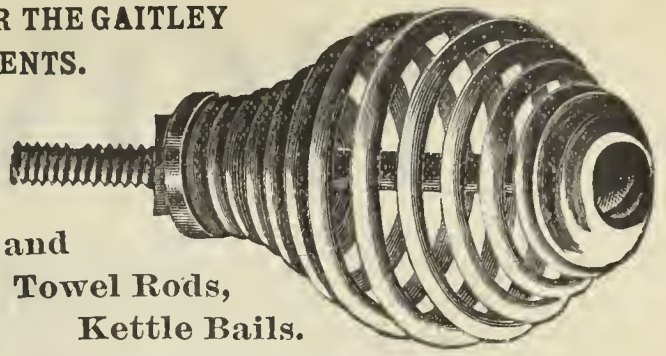
DAVID WILLIAMS, Publisher & Bookseller, 96-102 Reade St., N. Y.

—HAD NO EXPERIENCE.—Lady: "I thought, cook, that I told you I wanted curried chicken for dinner."

Cook: "Yes, ma'am, I know it, but I never curried a chicken in my life. I'm no hostler myself, and the groom said he was too busy to show me how."—*Exchange.*



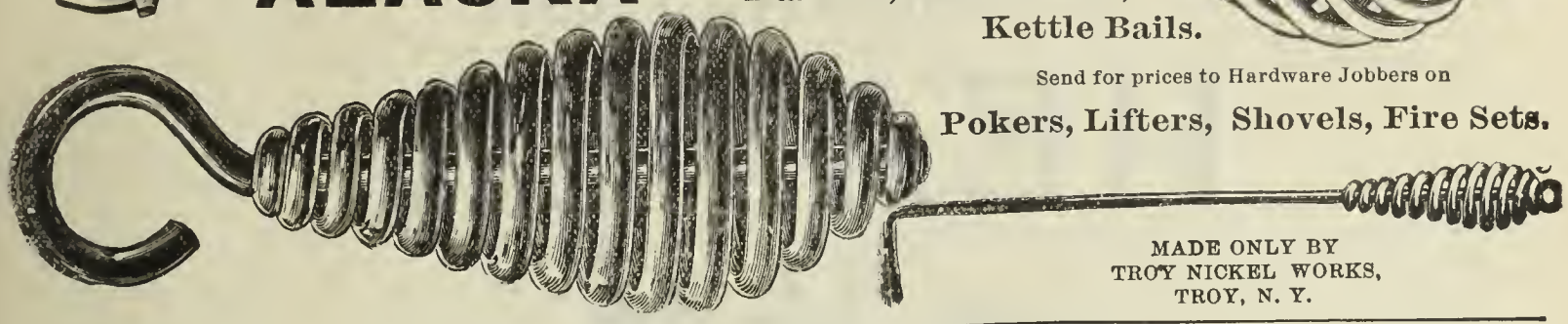
MADE UNDER THE GAITLEY PATENTS.



ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.

Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.



MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

ART OF COPPERSMITHING.

A PRACTICAL TREATISE ON WORKING SHEET COPPER INTO ALL FORMS.

By JOHN FULLER, Sr.

Size, 10 x 6½ inches ; 327 pages ; 474 engravings. Price, $3.00.

THIS book is brought out to meet the needs of a body of sheet metal workers whose trade has never before been thoroughly described. The author has acquired proficiency in copper working through a long apprenticeship and many years of actual labor at the bench. The instruction he gives is, therefore, entirely practical and will be correspondingly valued by those who are in any way interested in coppersmithing. A special feature of the work is the illustrations, of which there are 474, and which add much not only to the interest but the value of the text, as they show the work in all stages of progress and illustrate all the appliances, patterns and tools. The work is divided into sections, each treating a separate topic, and is thoroughly indexed. The style of the writing is exceedingly simple, and the descriptions of work go into the smallest details.

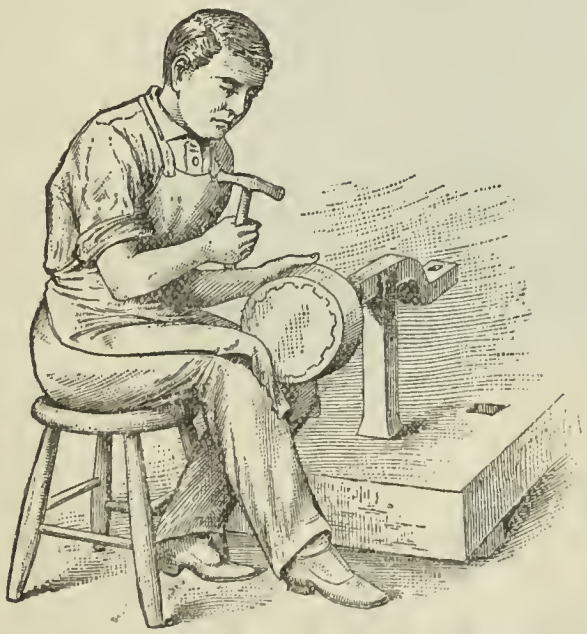


Fig. 107.—Planishing Tea-Kettle Side.

CONTENTS:

Historical Sketch of Copper ; Braziers' Art, or Light Coppersmithing ; First Year's Experience ; Repairing and Tinning ; The Boy's Second Year ; Making Washing Coppers ; Making Small Brewing Coppers ; Table of Dimensions and Capacity ; Making Hand Bowls ; Making Frying Pans ; Making Closet Pans ; Making Water Balls ; Mounting for Copper Goods ; Glue Pots and Tea-Kettles ; Oval Tea-Kettles ; Beer Mullers ; Funnels ; Coffee Pots ; Saucepans and Pudding Pots ; Stewpans ; Stock Pots ; Fish Kettles ; Brazing Pans ; Tea Boilers ; Warming Pans ; Preserving Pans ; Dripping Pans ; Coal Scoops and Coal Hods ; Making Coal Scoops ; Planishing and Smoothing ; Cranes or Syphons ; Pumps ; Appliances of Railway and Marine Coppersmiths ; Making Copper Pipe ; Piecing and Joining Pipes ; The Fire Pots ; Fire Pot Set for Brazing Joint ; Soft Soldering Large Joints ; Taking Templates ; Filling and Bending ; Making Bends ; Template Boards ; Patching Pipes ; Outlets ; Expansion Joints ; Tee Pieces ; Three-way Pieces ; Cross or Four-way Pieces ; Saddle Fire ; Marine Work ; View of Maudsley, Sons & Field's Shop ; Making Large Bends ; Making Double Bends ; Brazing on Flanges ; Short Bends ; Air Pipes for Ships ; Making Hollow Spheres ; Brazing Sheet Brass ; Locomotive Brass Work ; Brass Dome Covers ; Heavy Pipes for Breweries ; Brewing Coppers or Kettles ; Dome Coppers ; Dome and Pan Coppers ; Tallow Coppers ; Dyers' Coppers ; Sugar Tieches ; Stills.

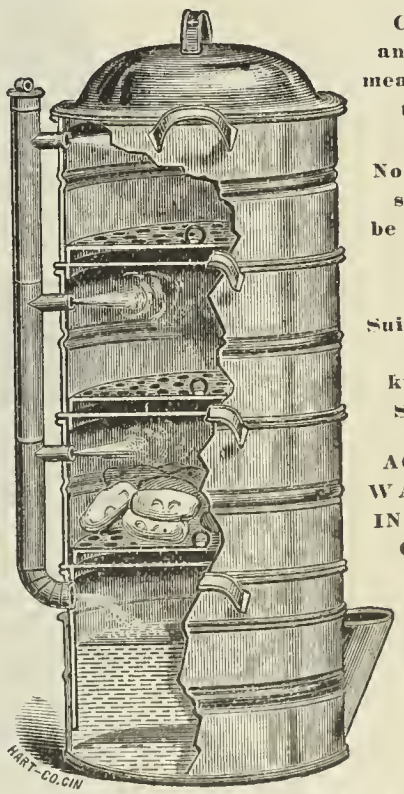
Sent, Post-paid, on Receipt of Price by

DAVID WILLIAMS, Publisher,

96-102 READE STREET NEW YORK.

The Celebrated "Robinson"

World's Fair Steam Cooker.



Cooks an entire meal at one time.

No family should be without one.

Suitable for ALL kinds of Stoves.

AGENTS WANTED IN EVERY CITY.

Liberal terms and big profits

Mfd. by

THE CINCINNATI STAMPING CO.,

386 Walnut St., CINCINNATI, OHIO.

Mention this paper, please.

— IN CHICAGO.—She: "I do hope, Edwin, you will not have to walk the floor with the twins to-night. You are so good natured about it, too—you never lose your temper."

He: "My dear, we must be prepared to make these little sacrifices if we expect to catch up with the greater New York."—*Puck.*

— "I DON'T believe in that proverb, 'Marry in haste and repent at leisure,'" said Cynicus. "Why not?" asked Ritterhouse. "It strikes me as being good."

"Ah," said Cynicus, "but you forget. The married man has no leisure."—*Harper's Bazar.*

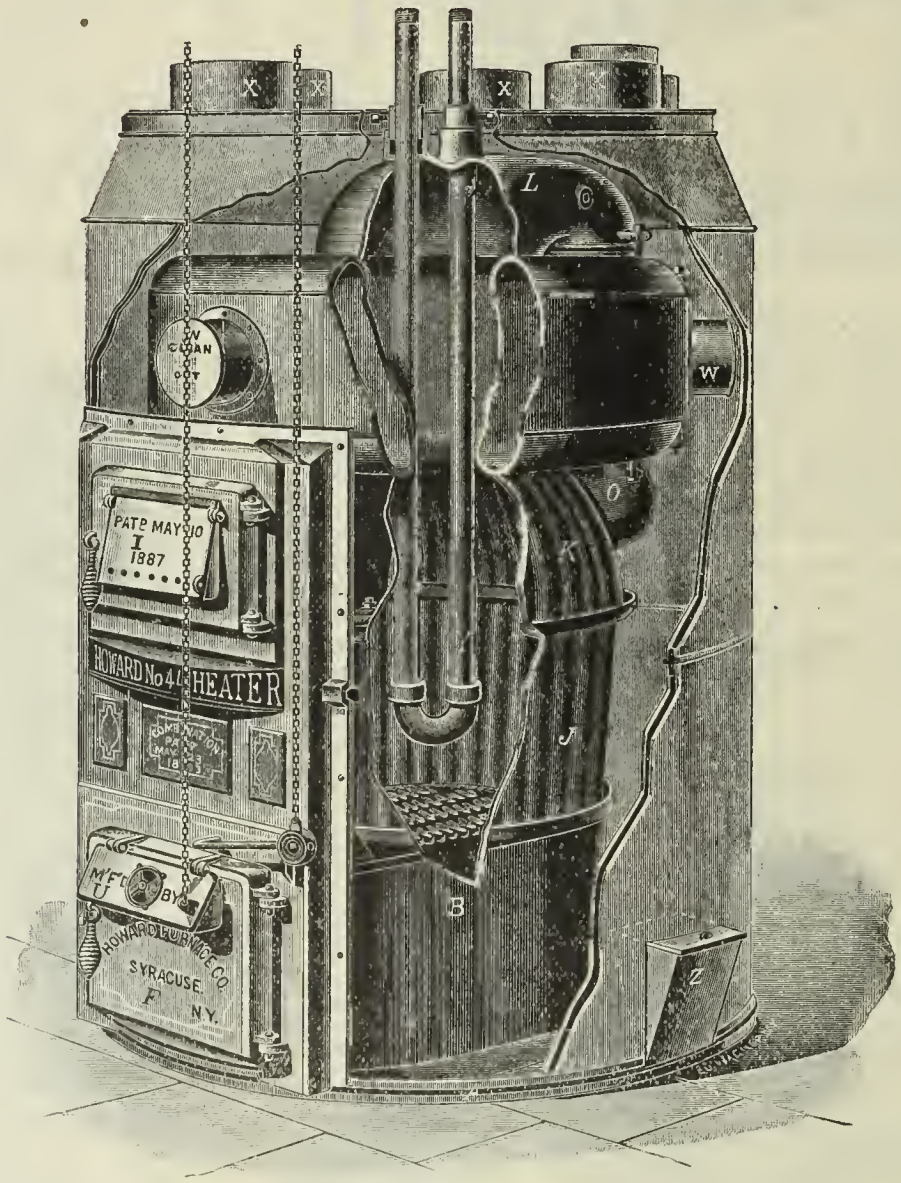
— LADY (in a crowded tramway car): "Thank you, sir; but I don't like to deprive you of your comfortable seat."

Irishman (who has risen to offer a seat): "Be th' powers, ma'am, it was comfortable no longer when Oi saw you standin'."—*Household Words.*

HOWARD

COMBINATION

HEATER.



IT'S ADJUSTABLE.

WE CAN TELL MORE.
WRITE TO

HOWARD FURNACE CO.,

SYRACUSE, N. Y.

New York, Boston, Grand Rapids, Toronto.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, February 23, 1895.

DAVID WILLIAMS - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO. ..59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 8.
Index to Reading Matter.....Page 50.

Chimneys.

The influence of the chimney on the heating apparatus is well understood by the larger dealers and engineers. In too many cases the smaller heating man not only does not understand this, but is unable oftentimes, when he does, to procure a proper chimney, as his recommendation is looked upon as a desire to secure additional profit through the erection of a chimney. Chimneys have always been more or less puzzling in their capacity, and a flue of given dimensions under some circumstances has demonstrated a much greater draft ability than flues of larger dimensions under seemingly similar conditions. If a large hot air furnace is connected with a weak flue the fire, instead of being bright and glowing with intense heat, will lie comparatively dead, and the inexperienced person in endeavoring to secure the full power of the furnace will fail, even though more fuel is consumed than would be needed to secure the highest efficiency of the furnace with a flue of strong draft. It is often the case where a small apparatus which has rendered excellent service is replaced by a larger apparatus, from which better service is expected, that it fails to give satisfaction or do as good work because of the incapacity of the chimney to work it at its best efficiency. This trouble is not confined to the furnace business alone, but the makers of steam and hot water heating boilers have found in a number of cases much dissatisfaction to result from poor draft where the boiler, which had ample capacity and which had been piped carefully in accordance with good practice and ample radiation, had been properly placed. Expert investigation as to the cause of the trouble invariably resulted in finding that the chimney had too small capacity. This trouble is no small one to confront in the heating of old houses, and oftentimes the use of one apparatus has to give way to two of smaller dimension, in order that the chimneys which are in the building may be used and satisfaction secured. In the erection of new buildings the owner is often surprised, as well as the architect, after they have decided on a steam or water heating plant, to find the heating contractor demand a flue much larger than has been calculated for in the building for use in connection with his apparatus. Many dealers would save themselves an immense amount of worry and expense if the capacity of the chimney was well looked into previous to contracting for and installing a heating plant where a large apparatus is to be used.

The Drift Cityward.

A business man of New York, well known for his active interest in the younger men of the laboring classes, and whose personal acquaintance with the condition of the city's poor is both wide and sympathetic, was lately lamenting the growing tide of unskilled labor which sweeps into this city every year from the country districts. Did they but realize it, most of the country boys and young men who add themselves to the population of New York City from month to month could, he argued, secure a far better position for themselves in the smaller towns, where the labor market is usually not overstocked. They foolishly elect, however, to go to the large centers of population, where the struggle for existence is always of the most stringent and bitter character. This fact has been particularly noticeable during the past year or two, when times have been unusually hard. Not only young persons, but older people, out of work and perhaps in want, start away from the small towns and country districts with the idea of finding a wider opportunity to better their condition in New York or some other great city. This class of labor has been arriving in shoals during the recent period of depression, recruiting the already unwieldy army of unemployed in most of the greater cities. No graver mistake could be made. As a rule, small towns and villages have less excessive poverty to relieve than the great centers of population, in proportion to their resources. Able bodied single men, especially, should make their way to the country rather than to the cities. Many farmers would be glad to give one or two men, at least, a chance to earn their board and lodging by work in clearing up fields or making improvements in farm buildings, &c. This provision would be, for a while at any rate, far preferable to tramping the city streets day after day in a hopeless search for work, half starving meanwhile.

Heedlessness.

It does seem as though nothing was more aggravating in boy or man than the spirit of heedlessness. Once yielded to it becomes characteristic of the individual, and it is displayed in every act. It renders him useless in almost every position in which he may be employed, and is generally a pretty good indication that his mind is not upon his work. It results in a continued series of errors and disasters, of little blunders and unbounded waste. The person who is dominated by this influence guesses rather than takes the time to figure, is forever cutting off the sheet too short or else wastefully too long, is habitually unsystematic, never knows where things are, and never puts them back in their places, and is forever leaving things almost done when they might just as well have been completed. The cure for all this is hard to effect. Slovenly methods cannot be at once replaced by systematic habits, but the process may be gradual where there is a will to turn from heedlessness to carefulness as a characteristic of one's life. It must be by a careful scrutiny of each act, by thoughtfulness at all times and a never-forgotten determination to do all things as well as it is possible to do them. Such habits are sure to appeal to an employer, and although sometimes long in coming, the conscientious employee seldom fails to receive the reward that he deserves. At all events, it should mean much to him that he has tried to do the best that he can.

According to the New York State Commissioner of Labor, the introduction of typesetting machines has reduced the number of employees in printing offices from 20 to 60 per cent. If a recent announcement of the Paris *Figaro* is to be relied on, the printing trade is on the eve of a revolution which is likely to still further cut down the number of compositors enormously. The medium is a typesetting machine invented by Père Calendoni, a Sicilian monk, which, it is claimed, will compose 50,000 letters per hour. The difference in speed, compared with existing machines, lies in the fact that instead of each letter being made to fall separately into the composing stick, entire words can be composed in a moment by the simultaneous application of the fingers of both hands. M. Mazereau of the *Figaro* asserts that he has himself manipulated the instrument with complete success.

THE LETTER BOX.

A Question in Furnace Construction.

From CONTENTION, *Canada.* — We would be much pleased if *The Metal Worker* would kindly submit the following in the Letter Box for discussion by its expert readers. We make a coal furnace with a steel dome having two descending and one ascending steel flues, separated about 2 inches from the dome. These flues lead into a steel radiator surrounding the fire pot, leaving a space of about 3 inches between it and the pot. The distance from the outside of the radiator to the casing is about 1 inch. The question is whether more heating power would be obtained by having the radiator cast on to the ash pit, leaving 4 or 5 inches on the outside of it between it and the casing. The contention is whether more heat would be obtained by having all of the space on the outside of the radiator or having the air ascend on both sides of the radiator as first indicated.

Will It Work?

From B. M. C., *Hoboken, N. J.*—Replying to your correspondent "F. L. M.," Roseville, N. J., in *The Metal Worker* February 16, other things being equal, the location of the radiator is immaterial, but the heat derived will vary according to the quantity of water drawn from the boiler for household purposes. More satisfactory results would probably be obtained by having the radiator supplied from a small supplementary horizontal boiler above the range, having separate connections to an independent or secondary water back, and supplied automatically from an overhead tank. We know of a three-story brick house in this city heated throughout from the kitchen range on a somewhat similar plan.

Thawing Frozen Street Pipes.

From A. M. K., *Lititz, Pa.*— Will *The Metal Worker* describe some way to open up a frozen supply pipe which is under the street without digging it up?

Answer.—A common practice is to use a small sheet metal steam boiler, which may be placed on a charcoal furnace or a gasoline fire pot. The boiler is provided with cocks to show the water line, a funnel at the top to fill, a hose cock to which a hose may be attached, and, most important, a safety valve that will blow off freely at a low pressure, not over 5 pounds. The hose should be of good rubber, several feet long for convenience, and attached to ¼ inch block tin pipe wound in a coil so that it can be unrolled as used. Whether the pipe frozen is in the ground or covered with wood work, an opening must be made so the coil can be inserted. In the case mentioned there is probably a stop cock on the pipe in the cellar. The pipe should be cut off on the house side of the stop and the stop opened. On inserting the tin pipe it should be pushed in until ice is struck, then by turning on the steam the process of thawing without digging up the street is accomplished. When the water begins to run the steam pipe is withdrawn and the stop cock closed until the pipe is repaired. Some plumbers put a brass union in at the severed point, so that provision is made for thawing in future if necessary. If the pipe to be thawed has many turns in it the rubber hose can sometimes be made to pass them, but if it will not other openings in the pipe must be made. In *The Metal Worker* of February 18 and 25 and July 1, 1893, are letters on this subject with illustrations.

An Old Stove.

From B. L. F., *Lawrenceville, Pa.*—I am very anxious to learn when a very old stove which I possess was made. The name on it is:

"The Signe of the Anvil and Sledge. Made by John Spencer & Co., Albany, N. Y."

It is of the shape and about the size of an old fashioned fire place for wood, and the old lady from whom I secured it claims that it was used in either the first Methodist or Presbyterian Church in New York City.

Mechanical Telephone.

From SUBSCRIBER, *Paris, Ill.*—Will *The Metal Worker* give me a little information regarding a mechanical telephone? I have a Regina music box, and wish to convey the sound from the second story to my shop below. I bought a toy drum, cut it in two parts, and used them for diaphragms. They were secured in position by means of iron straps, and connected with a wire, there being one turn in the wire where it passed through the floor. As this arrangement did not operate, I placed an 8-inch pipe so as connect the music box with upper diaphragm, with no better success. I then used a waxed linen thread in place of the wire, and this did not operate. Does the turn in the wire stop the sound, or would it be better to have larger drums? Would an electric telephone work better? What is the cost of same, and where can they be obtained?

Answer.—To have a mechanical telephone operate properly there should be no short bends in the connecting wire, and this wire should not come in contact with any solid object. The bends should be made in a large curve, which can be done by fastening a number of soft cotton strings to the wire and securing these to small nails. As the drum heads are liable to become damp from the moisture in the air, and are difficult to keep tight, they are not so well adapted to the purpose as thin pieces of pine. Large drum heads would be no better in this respect. An electrical telephone might be used for the purpose of conveying sound from a music box, but it would be necessary to hold the receiver to the ear, as in ordinary use. Such telephones cost about $18, and can be procured from the Western Telephone Construction Company, 539–541 Monadnock Building, Chicago.

Objects to Waste and Cool Water.

From C. M., *New York.*—I am somewhat puzzled about a kitchen boiler which is set close to a range, but does not furnish hot water promptly to a sink, which is also close to the range. We have to let the water run a long while before the hot water comes, and as the boiler is supplied by a tank which is filled by a hand pump from the cistern the waste is a very serious objection. I think the water back is not large enough for the 40 gallon boiler, because the upper pipe from the water back is never so hot but what the hand can be placed on it. My customer did not want the pipes overhead, so we ran them from the boiler down to the cellar and across under the kitchen and up to the sink, then up to the bath room and wash bowls on the second floor. It is my opinion that better service would be secured if the pipes were overhead. The bottom of the boiler is 2½ feet above the floor and above the top of the range. How can the hot water flow be quickened without wasting so much water?

Answer.—The size of the stove not being given, it is difficult to form an opinion as to whether the water back would be of sufficient capacity to heat a 40-gallon boiler. It is quite probable that a much smaller boiler would give better results with the water back now in use. Another trouble is caused by the pipes running down into a cold cellar and being exposed. If the water is not specially hot and the water back of ample capacity, it is more than probable that the water lying in the pipe would be quite cold, and when the faucet over the sink is opened this water would have to run off before hot water could come. Wrapping this pipe with hair felt or some similar material to prevent its cooling will reduce the trouble. Where the waste of water is objectionable it is often advisable to use what is known as a circulating pipe—that is, a pipe of smaller diameter leading from the hot water pipe at the faucet back to the boiler and connecting with the pipe at the bottom of the boiler. Our correspondent is correct in assuming that less difficulty would be experienced if

the pipes were run across the ceiling of the warm kitchen; and in these times, when exposed plumbing work is becoming more general, there is little objection to a neat job of piping.

Coloring Brass.

From W. E. B., *Reading, Pa.*—Please inform me through the columns of *The Metal Worker* how I can produce an old copper finish on brass or bronze. I would like as simple a method as possible, one that any tinsmith can use.

Answer.—The article to be colored should be chemically clean so that the coloring solution is free to act on the exposed surface. While the article may appear to be clean, the surface may still be covered with a greasy film or oxide. This can be removed to a great extent by the use of polishing powders that are free from grease. The article is then to be dipped in a pickle composed of 1 quart each of water and sulphuric acid. Add to this 1 pint of nitric acid and 1 ounce of hydrochloric acid. The article is first dipped in the above mixture, rinsed in clean hot water, and at once placed in the coloring liquid. The coloring liquid is prepared as follows: Dissolve 1 ounce of hyposulphate of soda in 1 quart of pure water. Into this is to be stirred another solution made by dissolving 1 ounce of acetate of lead in 1 pint of water. When to be used the solution is heated in an earthenware vessel to a temperature of about 195° F., when the article to be colored is immersed The color obtained will depend upon the time the article is held in the solution, the colors being golden yellow, copper, carmine, dark red, blue and brown. A red and green coloring can be given to brass by substituting an equal weight of sulphuric acid for the acetate of lead.

Wants Hotter Water.

From PLUMBER, *Nassau, N. H.*—I would like a little assistance from the readers of *The Metal Worker*. I put in a job of plumbing lately and my customer finds fault with it, saying that on some days he cannot get any hot water with a new fire. The job is put up in the usual way, with the exception that the hot water pipe runs to the cellar and then up to the bathroom on the second floor. I have examined the pipe at the top of the boiler and the water front and found everything clear. A 35-gallon boiler is used. Some days the water is hot; other days it is only warm.

Note.—No doubt our readers can give this correspondent some assistance. In the mean time we would suggest that it is quite probable that the pipes being exposed in the cellar to a low temperature and making such a long run previous to reaching the bathroom the water is cold before it arrives at the faucet. It may be that a 35-gallon boiler is too large for the water back that is used in connection with it, or the fire required to do the work for the family is less than would be needed to heat so much water. The trouble may be overcome to some extent by wrapping the pipes to prevent the loss of heat while the water is in transit.

Is It a Good Investment?

From J. B., *New Jersey.*—I have suggested to one of my customers that he should use a circulating system in connection with his kitchen boiler so that he could get hot water in any of the fixtures in his system immediately on any of the faucets being opened. In this particular case the actual cost of labor, piping and material for insulating the piping will not exceed $25. My customer asked me why he should spend $25, when for a few minutes' time he can get just as hot water, and further explained that as the $25 would be a permanent investment and the money being worth 6 per cent., he would be out $1.50 per year for interest. I have explained that in waiting for the water to come hot from his faucets he brings more cold water into his boiler and water back to be heated, and consequently requires more coal for the kitchen range. He claims that the fire would have to be run anyway, and doubts if there would be any increase in the consumption of fuel. It is my opinion, however, that in the course of a year he would not only save enough coal to pay the interest, but something on the principal, and that in a term of years much less than 25 he would save enough coal to pay for the circulating pipe and then receive a dividend on the investment. I should be glad to hear the opinions of the readers of *The Metal Worker* on the subject.

Will It Circulate?

From T. W., *Paterson, N. J.*—In *The Metal Worker* of January 26 I notice the inquiry of "F. D." and his heating plant. There is some space above the top of his flow main, and I should advise that this flow main be run up as high as it is possible and have an air vent connected with the expansion tank, the expansion tank, of course, to be above the flow main. From this point the flow main should have a fall instead of a rise, as shown in his drawing to the heating coil. This will give him better chance for circulation. In order to get the cold water from the coil in the pit back into the heater, it will be necessary to have a sufficient hight of column of water back of the coil to let the weight of the water overcome the weight of the cold water in the coil. If he has sluggish circulation or his job fails to circulate altogether, he will know that the hight of the water column is not sufficient. Then it may be necessary for him to put the expansion tank on the floor above and to run a siphon up to it and drop down immediately alongside of the expansion tank to where it connects with the main that runs over to the first coil. Then no difficulty should be experienced in getting good circulation through the coil in the pit.

Gasoline Burner for Cook Stove or Range.

From C. D. FOWLER, *Berwick, Pa.*—Will some of the readers of *The Metal Worker* inform me through the columns of the Letter Box if they know of a gas burner intended for use in connection with a range or cook stove, which will burn gas made by a gasoline machine? I want to heat the range in the same way that coal would heat it, and am anxious to learn of the name of the manufacturer of the burner.

A Direct Hot Water Connection.

From D. & W., *Bellwood, Pa.*—I would like to get some information about making a direct connection from the water back in a stove to a sink. The water back will be connected with the boiler in the usual manner, but owing to the surrounding conditions it would be much more convenient to take a pipe from the water back direct to the sink than to take it from the top of the boiler to the sink. Would there be any danger in making such connection and what would be the objection to it?

Answer.—There would be no danger in a direct connection from the water back to the sink. The objection, however, would be that in all probability cold water would be drawn through this faucet after a small quantity of hot water had been secured. The water back receives its water supply from the bottom of the boiler and as soon as any hot water faucet is opened cold water enters the boiler to take its place. This cold water passes immediately to the water back, and if a direct connection were taken from the water back to the sink, the cold water would pass but slightly warmed through this pipe to the faucet.

Emanuel Samuel, vice-president of the Steel Bath Mfg. Company, Detroit, Mich., was accidentally killed in New York on the 3d inst., by falling down an air shaft in an apartment house where he was visiting. Mr. Samuel was a widower, 45 years of age, and had resided in Toronto, Canada, for 30 years. He was liberal in his charities, and recently donated $1000 to the new synagogue on Bond street. He was president of the Metellic Roofing Company, and a member of the well-known wholesale hardware firm of M. & L. Samuel, Benjamin & Co., Front street, Toronto.

The Metallic Cabinet Company, Cincinnati, Ohio, are about to publish a complete catalogue of the various styles of metal furniture that they manufacture. Advance pages show some of these specialties and illustrate the capability of sheet metal for this class of work. Cabinet files and cabinets of various sorts are shown. The advantages afforded by this material for various furniture purposes will be readily comprehended.

The method adopted in Antwerp for purifying the filthy water of the River Nethe is to pass it through revolving cylinders containing small pieces of iron, it having been ascertained that 15 pounds of metallic iron is sufficient to purify a million gallons of water. The water thus treated is said to be completely freed from germs, bacteria and other ojectionable matter. Chemists find that the contact with iron reduces the organic matter from 45 to 85 per cent., and albuminoid ammonia by from 50 to 90 per cent., and all free ammonia is removed.

PLUMBING and GAS FITTING.

Allentown, Pa., Plumbers.

Secretary August Leibold of the Allentown, Pa., Master Plumbers' Association sends *The Metal Worker* a copy of their constitution and by laws and a statement that they have affiliated with the National Association of Master Plumbers. The firms composing the association are:

John H. Birchall,
J. C. Bitterling,
A. P. Deiley,
Mattern & Seagreaves, (2)
J. T. Reichard,
Shafer & Willenbecher Bros., (3)
Evans, Seagreaves & Co., (3)
Kiernan & Whitesell, (2) Bethlehem, Pa.

The following are the officers and committees:

President, John H. Birchall.
Vice-president, J. A. Shafer.
Secretary, Aug. Leibold.
Treasurer, M. F. Seagreaves.
Sergeant-at-Arms: J. T. Reichard.

Executive Committee: John H. Birchall, J. A. Shafer, Aug. Leibold, M. F. Seagreaves, Peter Kiernan.

Sanitary Committee: Lewis Willenbecher, F. E. Whitesell, E. B. Evans.

Investigating Committee: J. C. Bitterling, M. F. Seagreaves, Wm. H. Mattern.

Auditing Committee: J. A. Shafer, Lewis Willenbecher, A. P. Deiley.

Apprenticeship Committee: M. F. Seagreaves, Peter Kiernan, J. A. Shafer.

Conference Committee: F. E. Whitesell, E. B. Evans, M. F. Seagreaves.

Rhode Island Master Plumbers.

The convention of the Rhode Island Master Plumbers' Association at Pawtucket, R. I., last week, elected the following officers:

Patrick Tierney of Providence, president.

E. G. Lee of Providence, P. J. Murphy of Newport, C. W. Talcott of Woonsocket, C. P. Brennan of Providence, and David G. Fales of Pawtucket, vice-presidents.

James Oppeshaw of Newport, treasurer.

J. C. Conroy of Providence, corresponding secretary.

W. M. Congdon, financial secretary.

T. E. Manney of Providence, recording secretary.

The proposed law was discussed at length, and a unanimous vote taken to give it support and insure Rhode Island the same sanitary protection by modern improvements that other States receive.

At 4 p.m. the delegates sat down to a banquet, and speeches followed by ex-National President Trainor of Baltimore, D. G. Finnerty of Boston, John F. Deedy of Worcester, Inspector of Plumbing J. G. Read of Pawtucket, J. R. Tully of Boston, and others.

THE PLUMBING AND TINNING FIRM of Behner & Norton of Hartford, Conn., says the New Haven *Record*, has been dissolved. The business will be continued by F. E. Behner at the old stand.

New Perfection Irrigating Pump.

The accompanying cuts represent an irrigating pump, put on the market by the St. Joseph Pump Company, St. Joseph, Mo. The device is shown in

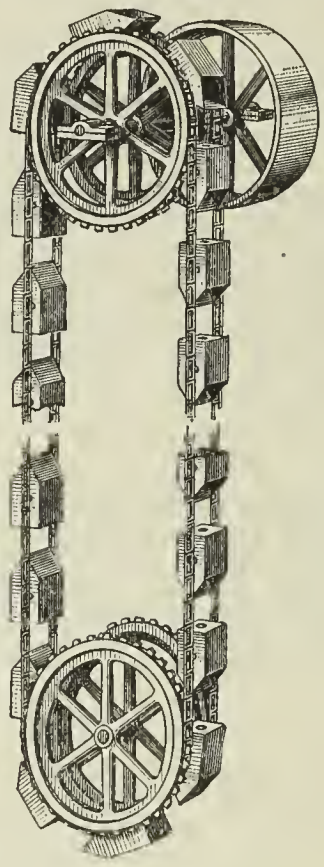


Fig. 1.—*New Perfection Irrigating Pump.*

Fig. 1, and an enlarged view of the bucket in Fig. 2, a portion being broken away to show the valve in the bottom. The bucket is made of galvanized iron, folded together by double locked seam, having a ball valve or air

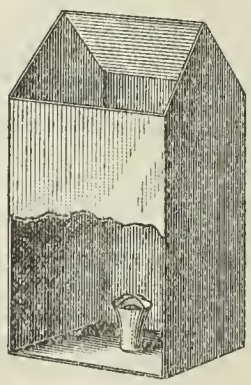


Fig. 2.—*Enlarged View of Pump Bucket.*

vacuum in the bottom to allow the air to escape as the cup fills with water, thus overcoming air resistance. As the cup passes over to empty, the valve or ball drops into a basket, which permits the air pressure to force the water, causing it to empty rapidly. It has been demonstrated, it is stated, that air resistance in a large volume of water is almost equal to the weight of the water itself, and the manufacturers refer to the pump saving almost one-half in power and machinery. It is claimed that, practically speaking, with the pump all that has to be overcome in the way of resistance is the actual weight of water, and that this is a feature peculiar to this pump only. When a pump is ordered, it is furnished as represented in Fig. 1, including the top gearing, babbitted boxes, sprocket wheels and driving pulley keyed on to the shafting; also with the chain and buckets and lower sprocket idlers keyed in position. The frame for the machine to rest on is designed to be constructed by the purchaser, after the plan of a common grindstone frame, to suit the lay of the ground. When hights of lifts are not given the manufacturers' quotation is based on a 20-foot rise to the top of the ground. The company state that the pump is adapted to the use of farmers, gardeners, stock and fruit raisers, and that it can be driven by horse, steam, windmill or motor power. It is further stated that the pump can be used in raising water from wells, rivers or canals, that it is especially adapted to use where a large volume of water is required, and that it is made with a capacity of from 50 to 1500 gallons per minute.

A Model Plumbing Establishment.

The building 212 Bank street, New London, Conn., occupied by L. Mallory has come out of the hands of carpenters and painters and the change in its appearance has been remarkable. Two large plate glass windows have been placed in the front, giving ample window display. The interior is hard wood finished throughout and has been fitted up to make the finest kind of a showroom for exhibiting Richmond steam and hot water heaters, elegant bathtubs, lavatories, siphon closets, and all their working connections, showing also the fine plumbing the firm are capable of.

In one window is shown a porcelain bath and a lavatory of light Tennessee marble with all faucets, trimmings, &c., silver plated. The window floor is covered with tiling and rugs and the effect is decidedly pleasing. In the other are shown Richmond heaters in two styles, painted white with gilt decorations and various kinds of ornamented radiators.

In the center of the store is a row of Richmond heaters. One is set in Philadelphia pressed brick, with a section left open showing the arrangement of the flues. On the north side is a row of siphon closets of modern design, with connections all made, showing their action with water. Another bath, steel clad and copper lined, is here shown and also an elegant lavatory with beveled plate mirror.

On the south side is set up a Jewett steel range with all the auxiliaries in working operation. Here are seen the plumbing connections to the copper boiler, the porcelain lined sink on one side and the convenient wash trays on the other. In the rear in one corner is

the business office neatly partitioned off, and further in the rear is the workshop, arranged with all the necessary appliances for promptly and skillfully turning out work.

The store is specially fitted up as a showroom, and everything is arranged just as it would look ready for use in a private residence.

Association News.

The Missouri Plumbers' Convention.

The Missouri State Association of Master Plumbers held its annual convention last week in the Elks' Hall, Hagan Building, St. Louis.

President L. B. Cross called the meeting to order at 10 o'clock a.m., appointing L. Marvin, R. T. Connell and Phil Kruez as a Committee on Credentials. John McDonnell of Kansas City, Ed. Byrne of St. Joseph, and John Mc Mahon of St. Louis were appointed as Auditing Committee, and T. T. Gray of Sedalia, Henry Goss of Kansas City, Harry Cooper of Springfield, and M. J. Ward of St. Louis as Committee on Resolutions. President Cross then addressed the meeting and congratulated the association on the good work already accomplished. The secretary reported 13 new members during the year, and the treasurer's report showed a balance of $1044.50. Initiation fees for individual members were increased from $2 to $5, and from $10 to $20 for firms.

A new plumbing law was advocated which provides for the inspection of plumbing in cities of 5000 inhabitants and over, and the appointment of a Board of Examiners, to consist of the health officer of the city, two master plumbers and two journeymen who have had at least 15 years' experience. The matter will be taken before the Legislature by a committee appointed by the association. Another committee of two will be appointed to canvass the State for new members. The election for officers for the ensuing year resulted as follows: L. B. Cross, Kansas City, president; Joseph W. Powers, St. Joseph, vice-president; John P. Kelleher, St. Louis, secretary, and Henry Goss, Kansas City, treasurer. The officers, with the addition of M. J. Ward and Harry Cooper, will act as the Executive Committee. Ed. J. Lonergan of St. Louis and Joseph W. Powers of St. Joseph were selected as delegates to represent the Missouri division at the Convention of the National Association, to be held at Philadelphia, June 11, 12 and 13.

St. Joseph was chosen for the next annual meeting, and the time was changed from the second week of February to the second week of April. After a vote of thanks to the local organization and to the press, the meeting adjourned *sine die*. In the evening the visitors were entertained at a banquet given in their honor by the local plumbers, and songs, recitations and speeches were listened to during the repast, which continued until a late hour.

THE Massachusetts State Association of Master Plumbers will hold its next quarterly meeting in New Bedford, Mass., the latter part of April, and at a recent meeting of the local Master Plumbers' Association the subject of the State association's meeting was considered.

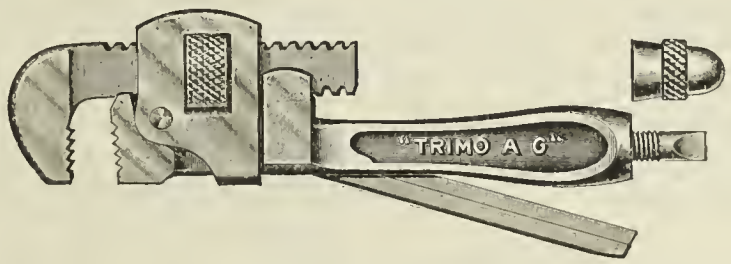
THE Wisconsin plumbers' organization have had a copy of the New York plumbing law introduced in the Wisconsin Legislature and P. H. Ryan and W. S. Patterson appeared before the legislative committee in behalf of its passage, clearly stating its points, and made a favorable impression in its favor on the committee.

JOHN HICKMAN, Paterson, N. J., State vice-president of the National Association of Master Plumbers from New Jersey, was caught out in the recent blizzard and badly frozen. It is reported that he is recovering and is still able to make one of his effective speeches.

MASSACHUSSETTS, MISSOURI AND CONNECTICUT PLUMBERS were honored at their State conventions. National President John Mitchell was at Waterbury, Conn., ex-Presidents Daniel G. Finnerty and John Trainor were at Boston, Mass., and National Vice-President L. B. Cross presided at St Louis, Mo.

Trimo Gas Fitters' Wrench.

The Trimont Mfg. Company, Roxbury, Mass., are putting on the market a wrench for gas fitters' use, as shown herewith. The wrench is 6 inches in length, and has a gas tip cleaner which shuts into the handle, as a knife blade. The cleaner is released for use by unscrewing the knurled cap at the end of the handle. By unscrewing the cap entirely a screw driver is disclosed. The tool is referred to as a handy pocket wrench, and is furnished both polished and nickel plated.



Trimo Gas Fitters' Wrench.

TRAPS AND VENTS.

R. L. DODSON, who was a member of the firm of Whitney, Dodson & Co., in Albuquerque, N. M., has opened a plumbing establishment himself.

THE BOARD OF PLUMBERS of Watertown, N. Y., met last week and granted a certificate of competency to F. B. Wilson, who was credited with 97 points out of a possible 117. The following plumbers now hold certificates of registration: Hyde, Young & Hyde, A. Beffrey, McCrady & Sutton, Howard & Arthur, J. W. Spratt, Pfister & Morath, J. J. Hartigan, J. J. Bragger, M. Harbottle & Co., Huntington & Weeks, G. H. Mowe, A. J. Easton and L. A. Howard.

THE MATTER of plumbers taking out licenses and furnishing bonds was brought up by the City Council of La Porte, Ind. All plumbers are to be made to take out a license and furnish a bond for doing their work in accordance with the requirements of the city. There are said to be now practicing in the city several plumbers who have neither licenses nor have they furnished bonds.

"STEEL CLAD BATHS, TORONTO" appears in raised gilt letters on the front cover of a pretty pamphlet which is issued by the Toronto Steel Clad Bath & Metal Company, Limited, Toronto, Ontario, Steel Clad Baths being made in Toronto, New York, Detroit and London. This is the third season of the concern, and in a prefatory note to the catalogue they refer to the constantly increasing sales of their specialty and the indorsements it has received from sanitary engineers and architects. Ten different full page plates show their various styles of the Steel Clad Baths, while sufficient descriptive particulars are given to enable the reader to form a very clear estimate of its features. Toward the close of the pamphlet cuts are shown of bath fixtures, range boilers, soap cups, pantry sinks, &c. At the end is a list of references and a number of testimonial letters.

THE City Council of Gloucester, Mass., is considering a plumbing ordinance.

J. C. DEGNAN, Middletown, N. Y., is exhibiting a shower bath of his invention in his window.

AT THE MEETING of the Board of Plumbing Commissioners, Jacksonville, Fla., last week, the report of Plumbing Inspector Moran for the eight months from May to December 31, 1894, was received and shows that 442 plans have been submitted for his approval. Of these, 85 were for inspections in new buildings, 265 for the remodeling of plumbing in old buildings and 92 for sewer connections. There were 195 inspections of new plans and 590 of old plans made during the eight months, and $639.50 was collected in fees. There were at the first of the year eight licensed plumbing establishments in the city, according to the inspector's report.

E. A. CREEVEY has purchased the entire business of the late M. R. Leavenworth, Bridgeport, Conn., who was engaged in the plumbing, heating and stove business for so many years.

THE MONTHLY MEETING AND BANQUET of the Plumbers' Supply Association of New England was held at Young's Hotel. Boston, Mass., last week. Frank J. Knox presided.

F. & F. C. BOOTH, who succeeded a short time ago to the plumbing business of the late Alfred Hopkins on Middle street, Bridgeport, Conn., report a very satisfactory business going on at the present time. They are handling the Mahoney steam and hot water boilers.

PAT KANE'S plumbing establishment at Alton, Ill., was entered by burglars last week.

AT THE ACADEMY OF MEDICINE, 17 West Forty third street, New York, last week, ex-School Commissioner Charles C. Wehrum read a paper on "How can the Sanitary Conditions of the Public Schools be Improved?" He said that it would require $7,000,000 to put the public schools of the city in the condition they ought to be. The Board of

Education was represented by Assistant Superintendent of Schools Lee, who gave his opinion that it would take three times $7,000,000 to put the schools in the sanitary condition they should be in.

F. A. Curtiss of Curtiss & Pierpont, plumbers, New Haven, Conn., has bought a lot and will build a residence in the spring.

The preliminary report of the sub Committee on Baths and Lavatories of the Committee of Seventy, of New York, has just been completed. The committee finds that New York and other American cities are far behind those of Europe in the matter of public baths. The public lavatories in this city are in the bar rooms and, with a few exceptions in the parks, are nowhere else. The committee describes at some length the system employed in London, especially the underground lavatories, &c. It recommends the duplication of the conveniences in the parks and the enlargement of those already built; ample provision of conveniences for women; the opening of a sufficient number of underground water closets near the greatest points of travel; the provision of a sufficient number of surface water closets, and the placing of lavatory accommodations as far as possible in public buildings. The committee further recommends that a part of each of the baths and conveniences be free and in the remaining part a small fee be charged; that the places be in charge of paid attendants, and they be under the jurisdiction of the Health Department.

Catalogue No. 1, dated 1895, and issued by the Pfau Mfg. Company, 138–142 Hunt street, Cincinnati, Ohio, shows a very extended line of Peacock tanks and seats, and likewise notes several other sanitary specialties. The firm have during the past year increased their manufacturing facilities, having added several new departments, including nickel plating, brass casting and finishing and stamping. The trade-mark which they have adopted for their goods is the representation of a peacock. Alluding to the tanks and seats the manufacturers say that they use dowels in each joint, thus insuring great strength and durability. The closets include the Objay and Epay, and the closet tanks in all styles and finishes are illustrated. Among the new goods are the Palm Scroll and the Grecian Border high grade tanks, which are decorated by sunken designs. The Roman pattern high grade seat and tank is a new fluted design of simple but elegant appearance. The Grecian Groove seat and tank are also new constructions, as is likewise the Royal. Other more elaborate designs are the hand carved seats and tanks. At the close of the catalogue illustrations of the different tanks showing their construction and operation are presented.

Smith & Webster, 15 to 21 North Clinton street, Chicago, have secured the entresol floor of the Unity Building, 81 Dearborn street, which is to be fitted up as a showroom for their plumbing specialties. It is an ideal location for this class of business.

The plant now under erection by the Victor Mfg. Company, at Blairsville, Pa., is nearly completed. The new concern will make a full line of porcelain enamel baths and enameled sanitary ware, also enameled specialties of every description. Their plant will be a very complete one and will include pattern shop and foundry. The concern received 5 acres of ground and a cash bonus from the citizens of Blairsville in consideration of their locating the plant at that place.

S. P. Olcott, formerly with C. W. Woodford, Port Henry, N. Y., and J. S. Huestis, formerly with F. E. Huestis & Brother, Crown Point, N. Y., have purchased the hardware, plumbing and tinning business of F. Jansen of Fonda, N. Y. Mr. Huestis is a practical plumber and heating engineer, being a graduate of the New York Trade School, while Mr. Olcott is a practical hardwareman who has been in the business for several years. The capital of the concern is $9000.

The Alberene Stone Company, 219 Lake street, Chicago, are to place a number of their laundry tubs in the Marine Hospital, Lake View.

Proper Location for Gas Meters.

The following extracts are from a paper read by Samuel Abbott, Jr., at the convention of the National Association of Fire Engineers at Montreal :

Experience has demonstrated the fact that the maximum degree of heat from a fire first occurs at the highest point in a room (except in the immediate location of a fire). Such being the case, it would be necessary to so locate the meter as to insure a minimum degree of heat for a reasonable time, thereby allowing for the discovery of the fire and notification of the fire extinguishing forces before the heat had arrived at such temperature as to melt the lead connections to the supply and distributing pipes or the soldering used in the construction of the meter. Very few fires originate in the immediate vicinity of a window of a building. Those that do are discovered early and invariably easily extinguished.

Taking the above experience into consideration, the uudersigned respectfully recommend that the proper location for gas meters in buildings, especially those used for manufacturing or storage purposes, should be at a point where the liabilities of the degree of heat in case of a fire should be at the minimum (which is usually near the floor of a room).

The connections between the supply and distributing pipes of the meter should be of iron, the meters where the soldered joints come to be inclosed in a sheet or galvanized iron hood sufficiently large to allow an air space. The hood would prevent interference with the meter and protect it from the direct heat of the flames.

New buildings should be piped in such a manner as to bring the main supply pipe directly perpendicular from where it enters the building and within easy reach of a window, the piping in the various stories diverging from the main pipe; where more than one meter is used, its location should be as previously recommended.

A shut off cock should be located in the supply pipe, either in the sidewalk or within accessible distance from the cellar window, the glass of which should be of such color as would make it distinctive and noticeable.

The subject of this topic not only is an important factor in a fire in its incipient stages, but is responsible for causing what would otherwise be incipient fires, conflagrations, and also many fires causing the use of large quantities of water that otherwise could be avoided. Often has it been the experience of many of us, where the lead connections of the supply and distributing pipes to the meter, or the pipe itself, becomes melted or disconnected, thereby allowing a fierce flow of gas flame, that invariably cannot be overcome except by the shutting off of the gas.

A Woman Plumber.

Woman ! woman ! that delightful creature so indispensable to man and equal to all of the emergencies made by his weaknesses, has shown that even the mysteries of the plumber's art can be included in her sphere and successfully solved when she goes to work.

In describing her experience, she said: "When sister came down to breakfast she said the water would not run out of the bathtub. I had to go out that day, and in my absence more water was run into the tub with the hope that the increased quantity would force itself out. Father had been consulted, but he had looked at it and said he didn't know what to do, and the water was still in the tub. I told my sister to send for a plumber, for I had another engagement the next day, but she was busy, and as the water had gone a sixteenth of a yard she thought it would all go in time. The next morning I concluded I would know how the 'ruffles were put on' that plumbing system, so I dressed for the work and took up the study of it. I took up the carpet, for I knew there must be some way to get at the pipes, and I found a board that was screwed down. I thought that was unusual, as all of the other boards were nailed, so I took it up to see what was under it. I got a screwdriver and took up the board and found that two other boards came up with it, leaving quite a good sized hole, so I could see under the bathtub. There I saw a short pipe coming down into a sort of a swelling and then running off somewhere, for I could not see the end. I felt all around the pipe and found a little cap with two prongs on it that I pried against with the screwdriver and it came loose so I could unscrew it. The smell almost made me sick, but I fished in there with a stick and got out a horribly nasty mess of lint, string and soap that nearly made me faint. I stuck to it, though, and pretty soon the water came with a rush, and I had to sit near that disagreeable mass with my hand over the hole till all the water ran off. Then I found the inside washed out quite clean, so I screwed on the little cap, got rid of the filthy stuff and put down the board and carpet without half as much fuss as a man would have made, and left everything perfectly clean and in good order. When the folks asked me how I knew how to go about it I told them that *The Metal Worker* did not lay about where I could see it for nothing."

The officials of the New York and New Jersey Bridge Company state that work on the general specifications and plans for the suspension bridge over the Hudson River are nearly completed, and that as soon as they are finished proposals will be advertised for. The wire for the cable will have to be capable of sustaining not less than 180,000 pounds to the square inch.

The paper box trust of the United States is at an end, through the defection from its ranks of one of the largest manufacturers.

HEATING and PLUMBING.

NEW WORK AND CONTRACTS.

ADDITIONS are being made to the school building at New Britain, Conn., for which the Fuller & Warren system of heating and ventilation has been adopted.

DANIEL W. BURNS, 4681 Lake avenue, Chicsgo, is to do tbe plumbing snd drainge work in the flat building of B. O. Gronset, 13 Anna avenue.

FRANK J. RUH, 1204 Diversey street, Chicago, has the contract for the plumbing snd drainage in the flat building of E. Haegele, Lincoln avenue and Diversey street.

JAMES J. DOYLE, 6040 South Halsted street, Chicago, has the contract for the plumbing in the flat building of James Owens, Green street, between Sixtieth and Sixty-first.

ROBERT R. HEANTSCH, 5631 Wentworth avenue, Chicago, has the contrsct for the plumbing and sewerage in the residence of John Dacy, Honore street, near Thirty-sixth.

ISAAC LEVY, 535 South Halsted street, Chicago, is to do the plumbing in the building of Julius Neiss, Wabash avenue, near Congress street.

JOHN SANDERS, 711 Sixty-third street, Chicago, has the contract for the plumbing and sewerage in the two residences of Levi Pritchard, 5638 5640 Sherman street.

MORRIS BROS., 2442 South Halsted street, Chicago, are to furnish the plumbing and drainage for the building of Robert H. O. Marks, 5113, Aberdeen street.

THE plumbing and steam heating contracts for the new house of Dr. F. W. Calkins, New London, Conn., have not been let.

BIDS for the supplies for the water department of Worcester, Mass., were awarded last week. The contract for cast iron pipes and branches was awarded to the Warren Foundry Company of Phillipsburg, N. J., for $18 a ton net for pipe and $35 a ton for special castings. The contract for lead pipe and pig lead was awarded to the Boston Lead Mfg. Company of Boston for the reason that their bid included delivery to any part of the city. The bids in this line were very close. The company above noted quoted 4¼ cents a pound for lead pipe and 3⅓ cents for pig lead, delivered. The contract for iron castings was awarded to Presby Pero of Worcester for 1⅞ cents a pound for new castings, Mr. Pero agreeing to pay 40 cents a hundred pounds for the old castings.

THE SPERL HEATER COMPANY, Carbondale, Pa., have been awarded the contract for heating by the hot water system the new Burke block on Sixth avenue; it will take one of their largest heaters to do this work.

GREEN & LOGAN, Bridgeport, Conn., are now finishing the plumbing and heating of S. Beardsley's house and D. E. McNamara's block, and have put in furnaces for D. A. Wood, J. Wilcoxson, Mrs. C. C. Seeley, F. Wheeler, C. Bradley and William Coulter, all in Stratford.

A SEVEN ROOM COTTAGE HOUSE is to be built in Stratford, Conn., by F. D. Robertson. There will be a tank in the attic, and the house will have modern plumbing conveniences and furnace heat.

THE BUILDING COMMITTEE of the West Hartford School, Hartford, Conn., are now deciding on the heating system to be adopted, and it is expected that Architect Becker will have the plans out for the building ready for figures within a short time.

E. S. BURNHAM, Hartford, Conn., is to build a $15,000 residence that will be heated by hot water.

ASHTON & GARRITY, Waterbury, Conn., have secured the contract for the plumbing, steam and gas fitting in the new Conlan Block. A McCormack boiler will be used with the H. B Smith Company radiators and Peck Bros. and Sanitas fixtures will be used in the plumbing. They also have the plumbing of the Delanay & Condon Block, and are putting two Page boilers in Dr. Rodman's house.

L. P. WALDO MARVIN, Hartford, Conn., is to erect a brick residence to be heated by hot water and having sanitary plumbing, fire places, mantels, tiling, &c.

THE EXETER MACHINE WORKS, 32 Oliver street, Boston, Mass., are furnishing the radiators for R. H White Company's new building in Boston, Buerkel & Co. having the heating contract.

A. V. FETTER, La Crosse, Wis., has secured the contract to put in the plumbing and heating apparatus for the new hotel at Medford, Wis., at $2500.

SEALED PROPOSALS will be received at the office of the Custodian of the United States Court House and Post Office Building at Jefferson City, Mo., until March 6 for certain plumbing and miscellaneous repairs upon the building.

GEO. L. ROOD, 79 Lake street, Chicago, has the contract for warm sir heating in the three residences of C. A. Baker, Euclid avenue.

FREDERICK J. KENDRICH, 3634 State street, Chicago, has the contract for the plumbing and drainage in the flat building of C. A. Lundelius, 1071–1073 Fifty-sixth street.

NOBLE & THUMM, 290 Lincoln avenue, Chicago, are to do the plumbing and drsinage in the building of H. L. Wheatley, 1965–1971 North Commercial street.

WILLIAM S. VERITY, 229 West Randolph street, Chicago, is to do the plumbing and drainage in the cottage of Samuel Brown, 137 Cosgrove avenue, and in two residences at 1210 and 2141 Potwine place.

BECKER & SCHIRRA, 643 Sedgwick street, Chicago, have the contract for the plumbing and sewerage in the flat building of W. Henning, 1527 and 1529 Grace avenue.

FOSKETT & BROWN, 186 Van Buren street, Chicago, are to do the plumbing in the store building of F. M. Woods, 1278–1280 Washington boulevard.

THE J. W. BROWN PLUMBING COMPANY, 364 Lincoln avenue, Chicago, are to do the plumbing and drainage work in the flat building of J. A. Bengard, 1042 Diversey avenue.

JAMES WELCH, 524 Ogden avenue, Chicago, has the plumbing and drainage work in the school building of Rev. G. Husser, 843 West Taylor street.

THE CHARLES H. SIMMONS COMPANY, 72 Market street, Chicago, are to install a steam heating plant in the store building of Heywood & Morrill, 272 Wabash avenue.

R. & J. KNIGHT, 896 Thirty-first street, Chicago, have the contract for the plumbing and drsinage in the flat building of Henry J. Rohrbsck, 3622 Wentworth avenue.

D. F. DEWAR & Co., 335 Sixty-third street, Chicago, have the contract for the plumbing and drainage in the residence of S. Kohn, Vernon Park avenue and Seventy-second street.

WILLIAM SIMS' SONS, 543 West Madison street, Chicago, have the contract for the plumbing and sewerage in the flat building of R. R. Thomas, 234 South Francisco street.

G. M. HAWTREE & Co., 6822 South Halsted street, Chicago, are to do the plumbing and sewerage in the flat building of Mrs. C. Squires, 517–519 Sixty-fifth street.

WM. C. BLETSCH, 1216 Belmont avenue, Chicago, has the contract for the plumbing and drainage in the flat building of Charles E. Matson, 1185 Sheffield avenue.

BYRNE & RYAN, 254 Forty-third street, Chicago, are to do the plumbing and drainage in the flat building of Joseph Duplesy, Champlain avenue and Sixty-fourth street.

THE UNION FURNACE COMPANY, 65 Dearborn avenue, Chicago, are finishing the steam heating work in the Kersage Building, 2954–2956 Cottage Grove avenue.

EDWARD B. SILVERY has secured the contract for the plumbing and heating in John Look's new house on New York avenue, Cottage City, Mass., and a Victor boiler is to be installed.

The report of the Chief of the Treasury Bureau of Statistics for January shows the exports of merchandise to foreign countries from the United States to have been $81,332,000 in value during the month, against $85,909,200 in January, 1894. For the seven months ending January 31, the decrease in exports as compared with the first seven months of the last fiscal year was $71,500,000. In January last the exports exceeded the imports by $13,793,746. In January, 1894, the excess of exports over imports was $33,987.549. During the seven months ended January, 1895, the excess of exports over imports was $94,099,612, and the excess for the corresponding period of the preceding year was $206,249,642.

A very decided improvement has taken place in the New York real estate market, and the outlook for the spring months is regarded as being exceptionally bright. Private sales amounting to over $3,000,000 in city realty were closed last week, and brokers report a heavy volume of investment orders in hand.

Representatives of some of the largest sewing machine companies in the United States were in conference at Cleveland, Ohio, last week, with the view, it is said, of consolidating their interests. The capital stock of the new combine is placed at $20,000,000, a large portion of which is likely to be taken by English capitalists. The Singer factories in the United States, Canada and Scotland are to be included.

STEAM AND HOT WATER.

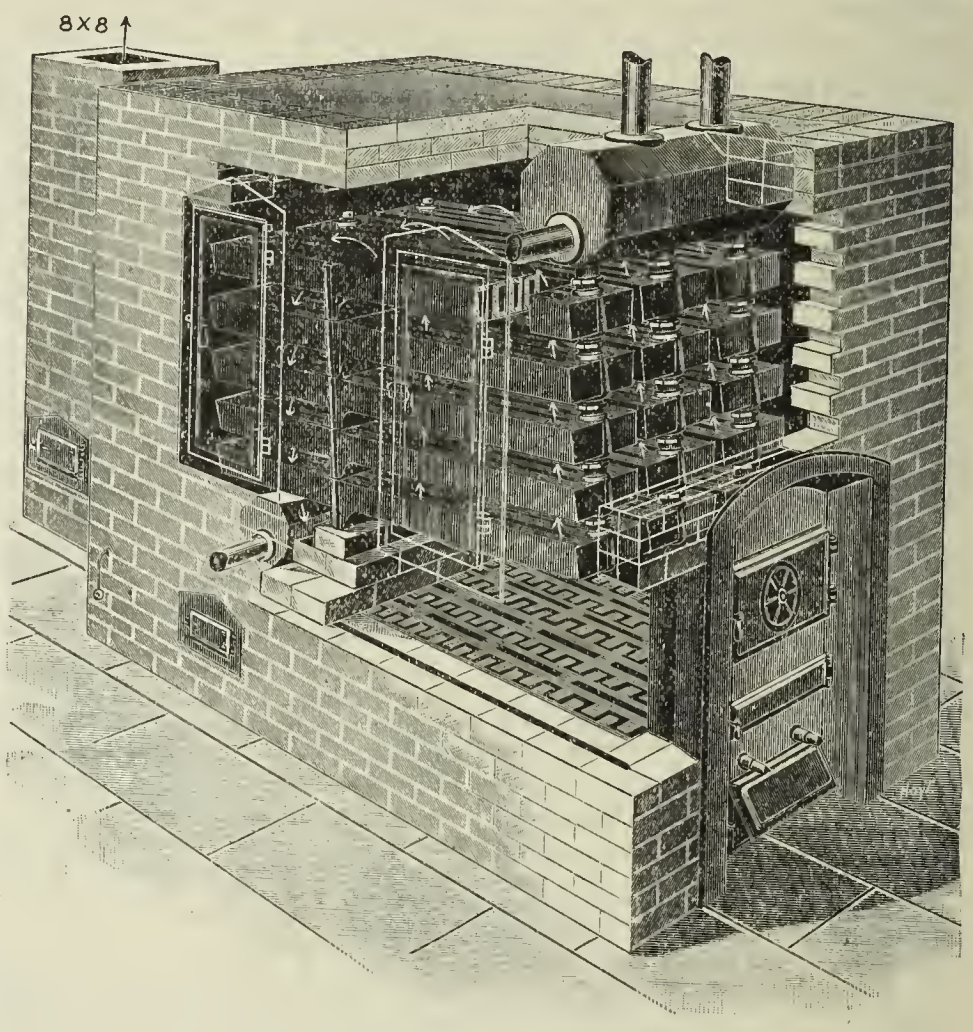
Master Steam Fitters.

A joint conference of the Executive Committee and Advisory Council of the Master Steam and Hot Water Fitters' Association of the United States was held at their headquarters in the Cable Building, New York, on February 15. James Curran was elected a member of the Executive Committee to serve the unexpired term of Frank Williams, who will continue his labors in the interest of the association as State vice-president for New York. The subject of entertainment at the national conventions was discussed, and in future less of the time of the delegates will be devoted to accepting hospitalities than has been the custom in the past. No provision will be made for the exhibition of goods at the next convention, though those who represent the manufacturers will be welcome guests of the association. The advisability of holding the convention at Philadelphia is being discussed, and if favorably decided it is probable that the date, which has not been fixed, will be the 13th, 14th and 15th of June. This is the same week that the National Association of Master Plumbers hold their convention, the date of the latter being the 11th, 12th and 13th of June. Should the same city and the same week be decided upon by the steam fitters it will be greeted with pleasure by many who have in the past regretted the impossibility of attending both conventions. The two associations are to be congratulated on the harmony that makes this possible and probable.

The U. S. Boiler.

The accompanying illustration shows very clearly the constructive features of the U. S. boiler, made by the U. S. Boiler Company, Titusville, Pa, and which is intended for either steam or hot water. In placing this boiler on the market the manufacturers had in view an apparatus that could be built up by the agents handling it, so they would not be compelled to have a number of boilers in stock to supply the requirements of their trade. The boiler, it will be noticed by referring to the illustration, is composed of a number of sections, placed one over the other, as many rows of sections being used as are necessary to give the required amount of surface for any particular job. The only parts to be provided for are the water leg and dome, the grates and all other parts being such that they can be used in any way required.

The surface of this boiler is over the fire and the heated gases in their upward motion strike the surface at right angles. When they get as high as possible they take a downward course to the flue which is at the lowest point under the water leg. On their upward travel the gases impinge on two-thirds of the heating surface, the downward travel covering the remaining one-third, and the gases leave the boiler at the point where the return water enters. The manufacturers allude particularly to the means by which the gases are held in the boiler until the greatest possible amount of heat is abstracted from them, the gases leaving where the water is coolest—that is, at the point of return to the boiler. It will be noticed the boiler is brick set, which is a system of construction that the manufacturers prefer, the points being made that it reduces the shipping weight of the boiler and that brick setting is more substantial, making the boiler run more evenly and is in the end most economical. The firm sell direct to the trade, and as the boiler can be made up in various sizes, the surface can be worked out with the same care as the radiating surface of the building. The connections are screwed, there being no bolts or packed joints. Each section contains 12½ feet of surface and the boilers can be built up to any size.



The U. S. Boiler with Casing Broken Away.

PHOTOGRAPHS of the indirect radiator of the Niagara Radiator Company, Buffalo, N. Y., are being shown to the trade by Walter Pendleton of the New York office, 89 Centre street.

Introducing Heating Systems.

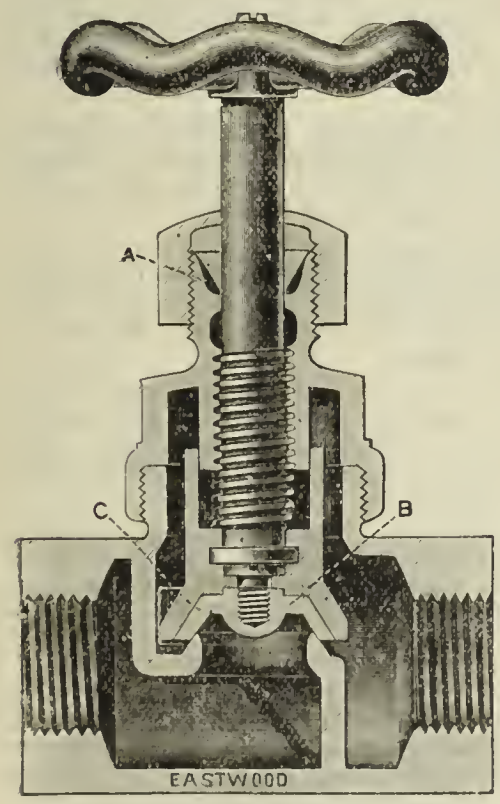
BY LISTENER.

A dealer in heating apparatus has pursued a course, with a view to extending his business, that may be followed by others throughout the country with advantage. At this season of the year, when houses are well or poorly heated, the public are more likely to be interested in new methods of heating than later in the year, and with this for an incentive he has prepared a series of articles on the use of both steam and hot water for house heating that are appearing in his local paper. It is claimed by good engineers that for some special buildings either steam or hot water is better adapted for securing a comfortable temperature throughout than some other means of heating. While this may be unquestionably true, many citizens are not only not aware of the truth, but in all probability would be slow to accept it on its presentation. If such a citizen was in need of heating apparatus and was approached by a dealer in either steam or hot water apparatus, the probabilities of a sale would be very slight. No little time

would be required to educate the prospective purchaser so that the value of either of these systems would be apparent to him. If, however, he had read in his local paper a series of articles giving the facts simply and comprehensively, without bias, about the different methods of heating and the manner in which they should be installed, the local heating man who furnished them would be silently strengthening his prospects for future trade. It is more than probable that the field of steam and hot water heating could be very materially enlarged if in a plain, sensible way the peculiarities of each were fully explained, where the average householder could digest them at his leisure and with no feeling of constraint to buy. There is yet in the minds of the people an idea that there is more or less danger of an explosion from a steam boiler for house heating purposes, and that a hot water heating system, though not so dangerous, is likely to leak and flood rooms, and while the people remain unfamiliar with these systems the work of education that is before both the dealer and the salesman of such apparatus will be arduous. Articles explaining away these notions would be interesting, and there should be no difficulty in securing their insertion in the local papers.

The Eastwood Valve.

The illustration herewith shows a sectional view of the Eastwood valve, for which patents were granted H. R. Frisbie December 4, 1894, and which are controlled by the manufacturers, the Eastwood Wire Mfg. Company, Belleville, N. J., and 39 Dey street, New York. The valve is made of perfection bronze, and it is claimed that the workmanship in every detail is of the highest possible grade, as the valve is manufactured specially to withstand the highest pressures. All parts are interchangeable, the principal feature being the copper disk which makes the face of the valve and the conical seat upon which it rests. This copper disk is struck up under a 500 pound drop hammer and is firmly fastened into the sleeve which secures the valve spindle by a screw held in place by the valve spindle. By this means it is impossible for the disk to blow out under a high pressure and to find its entrance into the steam pipe and choke it. The sleeve around the valve spindle gives additional strength to withstand the high pressure under which it is said that the valve can be used without disadvantage. Referring to the engraving, B designates the disk holding screw and shows the method by which the screw is locked which holds the disk to the sleeve, while C shows the disk. A is one of four flutings which is placed in a recessed cavity at the top of the valve for packing. The object of the fluting is to prevent the packing from turning with the valve spindle and bringing a pressure against the valve cap. It is pointed out that the method of making the seat joint is entirely new, as the frustum of the cone against which the struck up copper removable disk fits permits any sediment to be washed from the surface previous to the disk setting down on it and thus always insuring a tight joint. One of the tests to which this valve has been subjected was the screwing into one side of the valve of a 16-foot pipe which was filled with sand and connected with a live steam pipe. Then steam at 80 pounds pressure was turned on and all the sand in the pipe was forced through the valve, and after steam had commenced to issue the valve was closed and no difficulty was found in securing an absolutely tight joint. On removing the valve for examination its seat was found to be perfect. The valves have also been successfully tested on a number of digester plants where the steam pressure has been above 120 pounds as well as on the tops of digesters where a pressure of 80 pounds of sulphurous acid gas existed, and after months of wear they still prevent leakage. The valves are made as horizontal, angle and cross valves in all sizes from ⅛ up to 3 inches. They are made with iron body and composition mounted, in all sizes from ¾ to 14 inches, and it is stated that larger sizes will be furnished if desired. Price lists and descriptive circulars can be had by writing for them.



The Eastwood Valve.—Sectional View.

CHICAGO CAPITALISTS are negotiating with H. T. Yaryan of Toledo, Ohio, for an interest in his central station hot water heating system, with a view to introducing it in some of the Chicago residence suburbs. The heating plant that he has in operation in Toledo heats about 25 residences by means of hot water, which is pumped through underground mains to the residences. In each house is a coil of pipes located in the basement. Through this coil of hot pipes cold air is forced by means of a flue taking air through an opening in the foundation walls. This is distributed through the house in the same manner as hot air from a furnace The water used in the system is taken from the city water works in a large tank holding several hundred barrels, from which it is drawn into two upright heating cylinders about 5 feet long and 20 inches in diameter, where it is heated to a temperature of 180° by steam from a large boiler. By means of two pumps it is then distributed to the residences, in all through about 2 miles of pipe, and returned to the heating cylinders, where, having lost about from 20° to 30° of heat, it is used over again and kept in constant circulation. The boiler from which the steam is taken also furnishes the power for the operation of an electric lighting plant supplying light for about 38 residences in the neighborhood.

Uniform Contract.

In accordance with instructions of the sixth annual convention, Master Steam and Hot Water Fitters' Association of the United States, the Committee on Uniform Contract have submitted the following report and contract:

To the Master Steam Fitters and Heating Engineers of the United States:

We present for your consideration a Uniform Contract, being a digest of the opinions received at this office, grouped in a short form, and with the fewest possible blanks.

The words in italics are to show the proper filling out of the contract, and in the printed forms would be blank, as shown by dotted lines.

This Contract aims to cover items which have been found to operate to the disadvantage of our members, namely:

FIRST. That the apparatus shall be paid for when finished; the contractor, at the same time, holding himself responsible to maintain his guarantee at any time called upon. It is hoped this will avoid a retention of money for an unlimited period without recompense to the contractor, being in every case considerable loss.

SECOND. Relating to extra work. In this Contract it is put on the basis of being paid for at or near the time done, instead of being retained until final certificate is issued.

There having been a difference of opinion as to terms of payment, your attention is directed to Alternate Clause for Article VI.

Your attention is also directed to the clause providing for arbitrating disputes as to the true meaning of plans and specifications. It will be of great advantage if this or a similar plan can be carried out.

COMMITTEE ON UNIFORM CONTRACT.

Uniform Contract for the Construction of Heating Apparatus (to Be) Adopted for Use by the Master Steam and Hot Water Fitters' Association of the United States.

(*Copyright, 1895, by the Master Steam and Hot Water Fitters' Association of the United States.*)

THIS AGREEMENT, made and concluded at *Kalamazoo*, State of *Michigan*, the *first* day of *January* in the year one thousand eight hundred and ninety-*five*, by and between *Jones & Brown*, of *Chicago*, State of *Illinois*, for *themselves* and *their* legal representatives, parties of the first part (hereinafter designated the Contractor), and *R. I. Peters*, of *Kalamazoo*, State of *Michigan*, for *himself* and *his* legal representatives, party of the second part (hereinafter designated the Owner).

WITNESSETH, That the Contractor, in consideration of the fulfillment of the agreements herein made by the Owner, agrees with the said Owner as follows:

ARTICLE I. The Contractor, for the consideration hereinafter provided, covenants and agrees with the Owner that the Contractor shall and will, within the space of *three* months next after the date hereof, in a good and workmanlike manner, and at his own proper charge and expense, well and substantially build, furnish and erect a certain *Steam* Heating Apparatus, at

444 4th Avenue, City of Kalamazoo, according to the Specifications, Drawings and Plans designed by *Thomas Robinson, Architect,* which Specifications, Drawings and Plans are made a part of this Contract and are identified by the signatures of the parties hereto.

ARTICLE II. No alterations shall be made in the work shown or described by the Drawings and Specifications, except upon a written order of the *Architects,* and when so made the value of the work added or omitted shall be computed by the *Architects,* and the amount so ascertained shall be added to or deducted from the contract price. In the case of dissent from such award by either party hereto, the valuation of the work added or omitted shall be referred to three (3) disinterested arbitrators, one to be appointed by each of the parties to this Contract, and the third by the two thus chosen; the decision of any two of whom shall be final and binding, and each of the parties hereto shall pay one-half of the expenses of such reference.

ARTICLE III. Should any difference arise in interpreting the Plans or Specifications, involving or assuming additional compensation, the Contractor shall, upon written notice from the Owner, immediately execute such interpretation, the question of compensation to be determined on completion by arbitrators, as provided in Article II.

ARTICLE IV. All the materials and workmanship of the apparatus to be of the quality as expressed in said Specifications, Drawings and Plans; said Owner to reserve the right to reject, through himself or his authorized agent, all material or workmanship of an inferior quality, which said Contractor may attempt to use in the erection of said Heating Apparatus, and if the said Contractor, after being notified, neglects or refuses to do the work, or furnish the materials as called for in the Specifications, Drawings and Plans, then, and in that case, said Owner shall give notice in writing to the Contractor, which notice is to set forth in full the cause or causes of complaint. If the Contractor demurs and refuses to do the work or furnish the materials as directed in the notice of complaint, within three days from date of said notice, resort to arbitration shall be had as provided in Article II.

ARTICLE V. The Owner shall not, in any manner, be answerable or accountable for any loss or damage that shall or may happen to the said works, or any parts thereof respectively, or for any of the materials or other things used and employed in finishing and completing the same, loss or damage by fire excepted. The Contractor shall be responsible for all damage to the building and adjoining premises, and to individuals, caused by himself or his employees in the course of their employment.

ARTICLE VI. It is hereby mutually agreed between the parties hereto, that the sum to be paid by the Owner to the Contractor for said work and materials shall be *Seven Thousand Dollars ($7,000 00),* subject to additions and deductions as hereinbefore provided, and that such sum shall be paid in current funds by the Owner to the Contractor, in monthly payments to the amount of *90* per cent. of the value of materials delivered to and labor performed in the said building during the preceding month, and the remaining *10* per cent. shall be paid as a final payment within *30* days after the contract is fulfilled.

All payments shall be made upon written certificates of the *Architects* to the effect that such payments have become due.

ARTICLE VII. It is mutually agreed that payments for all additional work shall be made at the same time and in the same manner as contract payments, Article VI.

ARTICLE VIII. It is mutually agreed that should default be made in any of the payments as herein provided, the Contractor shall have the right to stop work and withdraw all unused materials until such payment is properly made, or may at his option cancel the contract.

ARTICLE IX. It is further mutually agreed that the essence of this Agreement is that the Owner purchasing this apparatus and paying therefor will receive full value to the extent that it will warm the subdivisions of the building indicated on the plans to *70* degrees Fahrenheit in the coldest weather; but nothing herein contained, or in the Specification accompanying the same, shall prevent the Contractor from receiving from the Owner a final payment for the work herein and at the time stipulated.

ARTICLE X. The Contractor guarantees his workmanship and materials, the capacity of the boiler, the circulation of the system and the efficiency of the heating surfaces, all as called for in the Specifications hereto attached, and should any defects or deficiencies occur, other than from neglect on the part of the Owner or his employees, within the term of one year from the above date, the Contractor agrees to make good the same upon a written notice from the Owner at the Contractor's expense.

ARTICLE XI. If at any time there shall be evidence of any lien or claim for which, if established, the Owner of the said premises might become liable, and which is chargeable to the Contractor, the Owner shall have the right to retain out of any payment then due, or thereafter to become due, an amount sufficient to completely indemnify himself against such lien or claim. Should there prove to be any such claim after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging any lien on said premises made obligatory in consequence of the Contractor's default.

ARTICLE XII. It is further mutually agreed, between the parties hereto, that no certificate given or payment made under this Contract, except the final certificate or final payment, shall be conclusive evidence of the performance of this Contract, either wholly or in part, and that no partial payment shall be construed to be an acceptance of defective work or improper materials.

ARTICLE XIII. The said parties for themselves, their heirs, executors, administrators and assigns, do hereby agree to the full performance of the covenants herein contained.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands and seals, the day and year first above written.

In presence of

J. B. Saxe

Jones & Brown (SEAL.)

R. J. Peters (SEAL.)

(SEAL.)

(SEAL.)

ALTERNATE FOR ARTICLE VI.

It is hereby mutually agreed, between the parties hereto, that the sum to be paid by the Owner to the Contractor for said work and materials shall be *Seven Thousand Dollars* ($ *7,000*) subject to additions and deductions as hereinbefore provided, and that such sum shall be paid in current funds by the Owner to the Contractor in installments, as follows:

When *The Boilers are delivered and set,* $ *1,500.00*

When *Steam Mains and Risers are in place,* $ *1,500.00*

When *The Radiators are delivered,* $ *1,500 00*

When *The Radiators are connected,* $ *1,500 00*

And the balance of $ *1,000 00* as a final payment to be made within *30* days after this contract is fulfilled.

All payments shall be made upon written certificates of the *Architects* to the effect that such payments have become due.

HEATING NOTES.

THE STEAM FITTER sees the Standard radiators at their best as displayed at 206 Centre street by John I. Leitch, manager of the New York house of the Standard Radiator Company, Buffalo, N. Y. A rich Brussels carpet covers the floor and the different heights of the 2, 3 and 4 column Standard radiators show with fine effect in the varied styles of decoration as arranged at one side of the showroom. Radiators of the 3 column pattern occupy the show window, and Standard indirect radiators are displayed at the entrance. On the other side of the showroom direct-indirect radiators are shown, and on a book stand circulars of the goods are conspicuously placed, while the trade papers are convenient for use by the visiting dealer. At the back of the showroom is the desk of Mr. Leitch, and in the wareroom beyond, which fronts on another street, a large line of radiators are carried in stock.

AT A MEETING of the creditors of the Pawtucket Steam & Gas Pipe Company held at Pawtucket, R. I., a report was presented in which was the following proposition: That the firm would pay 30 per cent. of their liabilities in cash within 30 days and 25 per cent. of their liabilities in 5 payments of 5 per cent. each, in 6, 9, 12, 15 and 18 months respectively. This proposition was unanimously accepted. Creditors or their representatives were present to the amount of $50,000.

THE HAMPSON FLEXIBLE STEAM JOINT COMPANY has been organized at Lakeport, N. H., with a capital of $35,000. The following are the officers: President, John S. Crane; vice president, W. H. Hampson; treasurer, B. F. Drake; secretary, M. F. Crane; directors, J. S. Crane, B. F. Drake, H. S. Young, W. H. Hampson, F. A. Barbey, H. E. Webster, A. J. Lane.

W. A. RUSSELL, the New York representative of the Detroit Lubricator Company, Detroit, Mich., spent the first of the week in Philadelphia and secured a contract for 5000 valves from a heating contractor.

THE UNITED STATES RADIATOR COMPANY, Saltsburg, Pa., are using a new lithograph letter head which shows their Ornate radiator at one side, with the word "Ornate" in a diamond with the words "trade-mark" under it in the center, and at the other side over the company's name is an eagle with spread wings and an American flag in each claw.

SECRETARY J. E. HOLLAND of the Holland Radiator Company, Chicago, is in New York for a few days talking radiators to the trade.

THE LYMAN WATER CIRCULATING & HEATING COMPANY have been incorporated at Chicago by Thomas Lyman, John S. Williams and William F. Storms.

THE AMERICAN BOILER COMPANY, 84 Lake street, Chicago, are now prepared to supply pipe and steam fittings from their warehouse, 46-48 South Canal street.

THE JOHN DOUGLAS COMPANY are to remove their Chicago office and showroom from Room 511, 34 Clark street, to more commodious quarters at 131 Lake street.

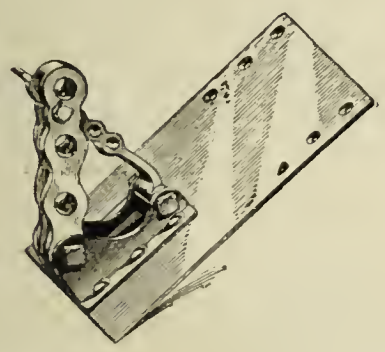
The safety of the Atchison bridge over the Missouri River at Atchison is said to be greatly endangered by the encroachment of the river. A canal is being dug to partially divert the stream through the island above the city. The canal will be over 1 mile in length and about 70 feet wide, its construction involving the removal of 167,000 cubic yards of material.

The Elgin National Watch Company and the Waltham Watch Company are to be consolidated and pass into the possession of a British syndicate. The valuation of the two properties is $16,000,000.

ROOFING AND CORNICE.

The Baird Snow Guard.

E. J. Johnson & Co., well-known dealers in roofing slate, of 38 Park Row, New York City, are the sole agents for the Baird Snow Guard, illustrations of which are presented herewith. The guard is the invention of John Baird, a practical roofer of thirty years' experience, who has long realized the need of a guard that would fully meet the wants of the trade. For some time he has been engaged in working out his ideas, resulting in the guard here shown. The device consists of an iron plate, in size corresponding to that of roofing slate, and provided with an upright support for the series of rods or pipes to hold back the snow. The upright support is adjustable so that it may be set for any pitch of roof. It is fastened at the bottom with a ½-inch bolt, and at its upper end to a supporting rod containing five holes, thus allowing it to be adjusted to any desired angle. A view of the guard, showing the manner in which it is constructed, is shown in Fig. 1 of the engravings. The guard is made of malleable and wrought iron galvanized, particular care being taken that its strength shall be sufficient to withstand any strain to which it is likely to be subjected. In Fig. 2 of the illustrations is shown a section of the roof of a building, clearly indicating the appearance of the snow guard when in position. Price lists of this snow guard will be furnished on application to Johnson & Co.



The Baird Snow Guard.—Fig. 1.—General View of the Device.

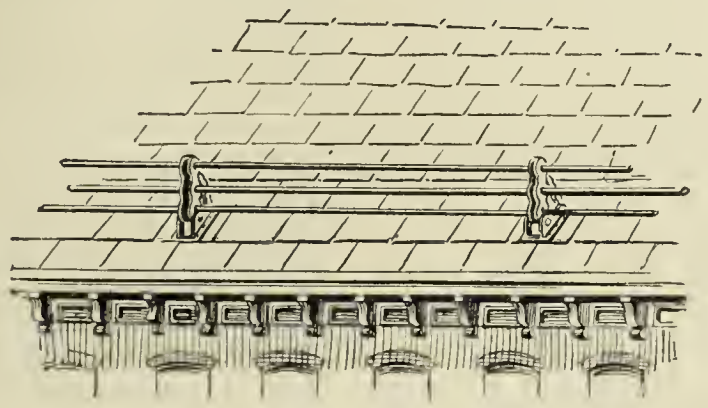


Fig. 2.—Appearance of Guard when in Position.

THE EAST BIRMINGHAM IRON ROOFING & CORRUGATING COMPANY, Birmingham, Ala., are sending out by way of advertisement a reply postal card, on one of which they tell of their business and on the reply sheet is a blank, making it easy to order roofing and siding of different sorts.

FLASHINGS.

THE PLUME & ATWOOD MFG. COMPANY, Waterbury, Conn., are about to build an extension 200 feet long to their main building. The building will be partly two and partly three stories in hight, of mill construction, with iron beams, gravel roof, metal skylights, &c.

J. J. COLVIN, 159 La Salle street, Chicago, is to do the galvanized iron work and slate roofing for the four-flat building of R. Stokes, Rockwell street, near North avenue.

H. J. LAWSON is to make very important additions to his metal works upon Lowell street, Manchester, N. H. Electric power has been introduced, and the power house is not only very convenient but is also a handsome sample of metal work, well worthy of inspection. Machines have been added for the spinning of copper, brass and zinc work. A neat and convenient forge room occupies one corner of the shop. Ponderous machines for the crimping and cutting of metal, and smaller ones for the shaping, burnishing and the other details of the architectural sheet metal work give Mr. Lawson the equipment for successfully competing for work all over New England.

JAMES J. WHITE, 185 Dearborn street, Chicago, has the contract for the copper cornices and 70 squares of tin roofing for the Duncan Avenue School, Duncan avenue and Seventy seventh street.

THE GALVANIZED IRON MAKERS in England have formed a combination for the checking of ruinous competition and the protection of their interests generally under the title of the Galvanized Sheet Iron and Steel Association. A large majority of the trade have, it is understood, joined the new association.

HENRY HENNINGSEN of Jersey City, N. J., is putting the finishing touches on the new City Hall job, in Jersey City, where he has used some 20 tons of galvanized iron and about 10 tons of 16-ounce cold rolled and soft copper, with imported Holland tile. The work amounts to about $16,000. He is also doing the bay windows and copper cornice for Patrick Byrne's new handsome residence in the same city, 18-ounce cold rolled copper being used.

B. M. SCHELLMANN, manufacturer of cornices and skylights, has removed to more spacious quarters at 190 Wooster street, New York City, his former place of business, where he had been for 25 years, having been torn down to make room for new buildings.

THE YOUNGSTOWN IRON & STEEL ROOFING COMPANY, Youngstown, Ohio, have appointed the Andrews Bros. Company, John McLauchlan, manager, 808 New York Life Building, Chicago, as their general Western agent, and ask the trade to correspond with them when in the market for anything in their line.

Sheet zinc, the British consul at Hiogo reports, finds a large and increasing demand in Japan, being indispensable as lining for cases containing matches for export. An advance in the price of this material has lately occurred in that country.

The British consul at Berne, Switzerland, reports to his government that the exports of aluminum from Switzerland increase steadily. Last year they were about $100,000 more in value than in the preceding year.

It is reported by the *British Trade Journal* that the Continental Zinc Syndicate for the regulation of the European mines of the metal is in danger of being disrupted. Negotiations for the renewal of the convention are still going on, but the difficulties in the way are said to be such that an agreement seems most unlikely.

Probably the largest single order for aluminum ever given is that of the French Minister of Marine. It is for 92,500 pounds of the metal, to be used in the construction of steam launches for the navy.

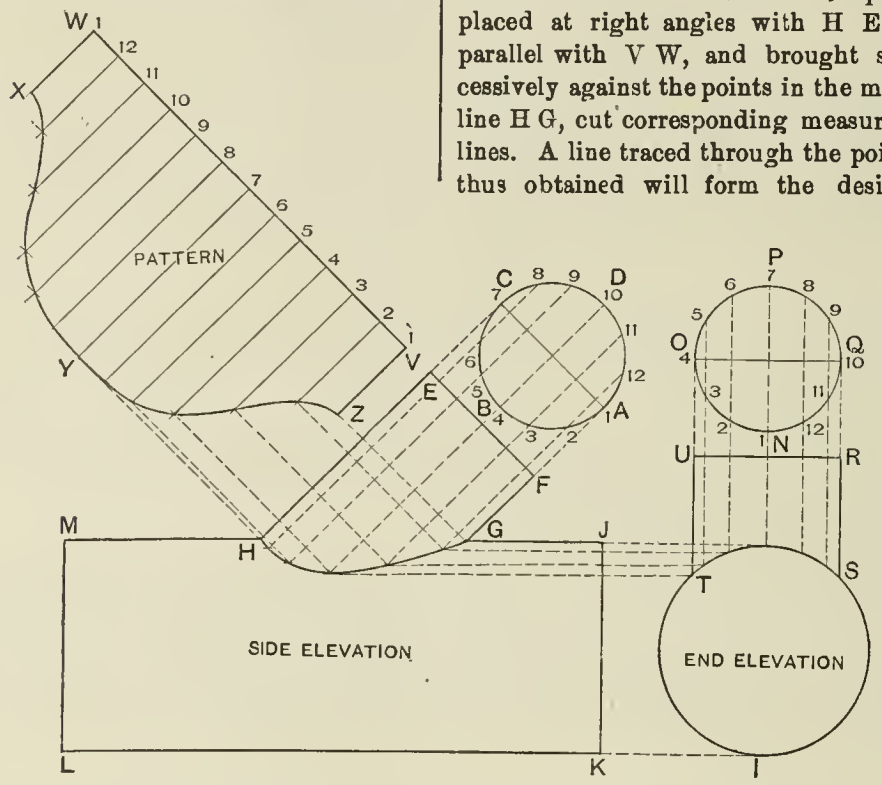
The dire effects of the flood at Williamsport, Pa., last year are reflected in the annual statement of the lumber operations from that point for 1894. The shipments are shown to have aggregated 196,185,000 feet, a decrease of 78,150,000 feet from the figures for 1893. The flood swept away 140,000,000 feet of logs from the booms, as well as much manufactured lumber from the yards, only a portion of which was recovered.

Immigration to the United States in January amounted to 8784 persons, against 9308 arrivals in January, 1894. It is still considerably below the average for many years.

THE TIN SHOP.

Pattern for Tee Joint.

From O. E. S., *New Prague, Minn.*—Will *The Metal Worker* publish a method for obtaining the pattern of a tee joint at an angle, the pipes being round and one larger than the other? Also pattern for elliptical pipe to join a round pipe at an angle.



Pattern for Tee-Joint at an Angle, One Pipe Being Larger than the Other.—Fig. 1.—Joint Between Round Pipes.

Answer.—In Fig. 1 is shown a side and end elevation of the article for which the pattern is desired. As indicated by A B C D, N O P Q and T S I, the pipes are round, pipe E F G H being joined to J K L M at an angle, as indicated by M H E or F G J. The end elevation is represented by T U R S I and the side elevation by M H E F G J K L The two profiles, A B C D and N O P Q, are to be drawn in line with the side and end elevations, as shown. To obtain the pattern of H E F G it is necessary to determine the points in H G through which the miter line is drawn. To do this divide the two profiles into the same number of equal parts, commencing at the same points in each. Draw lines from the points in N O P Q, parallel with U T, cutting T S. In a similar manner draw lines from the points in A B C D, parallel with H E, as shown. From the points in T S draw lines parallel with M J, which produce until corresponding lines from the two profiles intersect. Through the several points of intersection thus obtained draw the miter line H G. For the pattern of E F G H proceed as follows: On E F extended as V W, lay off a stretchout of profile A B C D, through the points in which draw the usual measuring lines at right angles to the stretchout line. With the T square placed at right angles with H E, or parallel with V W, and brought successively against the points in the miter line H G, cut corresponding measuring lines. A line traced through the points thus obtained will form the desired pattern. Then V W X Y Z is the pattern for part of article shown in side elevation by E F G H and in end elevation by R S T U. In Fig. 2 J′ K′ L′ M′ represents a round pipe, to which is joined the elliptical pipe E′ F′ G′ H′, profile of which is shown by A′ B′ C′ D′. In this example the major axis B′ D′ of ellipse is drawn parallel with side of arm H′ E′. In Fig. 3 the round pipe is represented by J″ K″ L″ M″, and the elliptical pipe by E″ F″ G″ H″. In this example the minor axis B″ D″ of ellipse A″ B″ C″ D″ is drawn parallel with side of arm H″ E″. The same method was used for obtaining patterns in Figs. 2 and 3 as was used for Fig. 1

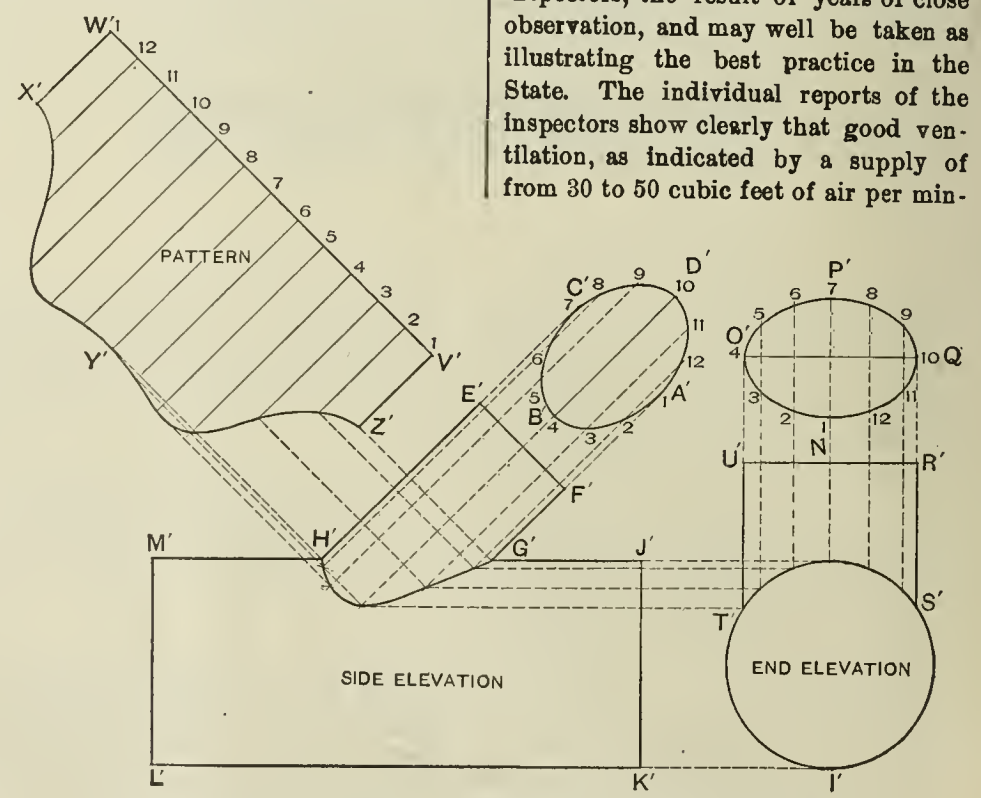


Fig. 2.—Joint Between Elliptical and Round Pipes.—First Example.

Heating and Ventilating.

That better ventilation can be secured in public and manufacturing buildings is well evidenced by the working of the law controlling this matter in the State of Massachusetts. The enforcement of this law being delegated to the State Board of Police, the report of the chief of that body, Rufus R. Wade, is always an interesting volume and clearly indicative of the progress in this particular line. The report for 1894, which has just appeared, although detailing the work of the department in all its various branches, devotes by far the larger portion of its pages to reports upon school house inspection. Of particular value is a series of lithographed plates illustrating model heating and ventilating arrangements for school houses. These embody the ideas of the inspectors, the result of years of close observation, and may well be taken as illustrating the best practice in the State. The individual reports of the inspectors show clearly that good ventilation, as indicated by a supply of from 30 to 50 cubic feet of air per minute per pupil, can be secured when the system is properly designed. They advocate the use of mechanical means in

the shape of a fan for moving air wherever possible, and illustrate one building in which one small fan forces air to hot air furnaces and another withdraws it through the ventilating flues. Each year thus makes simpler the enforcement of the law because of the better understanding of the principles involved in ventilation and a realization that good ventilation can after all be easily secured and at moderate cost.

Inspection of Uninsured Boilers.

In 1893 the Legislature of Massachusetts authorized the appointment of a temporary inspector upon uninsured steam boilers. The thorough investigations of this officer revealed such a condition of things that the succeeding Legislature continued his services, and his report for 1894 certainly warrants his still further continuance and the enactment of more rigid laws controlling the operation and inspection of this class of boilers. This should apply particularly to that most dangerous class, second-hand boilers. The immense responsibility resting upon the man in charge of a boiler is too often overlooked, and the daily peril of those in the vicinity of the boiler is never comprehended until some dire disaster occurs. In factories where the boiler produces steam for both heating and power some most startling conditions were discovered. In one instance a small upright boiler was found, upon application of hydrostatic pressure, to be leaking badly, while a portion of the internal shell had been so eaten away that for a distance of several inches it was reduced to less than $\frac{1}{32}$ inch in thickness. The owner nevertheless supposed that everything was in first-class condition.

School House Boilers.

As the work of this department became more widely known, requests were frequently made for the inspection of boilers in school buildings. The requests were complied with, and in every case defects were found, many of them of such a character that the boilers must soon become dangerous, while some were found already dangerous. It has been revealed in this way that very few school house boilers are inspected, and the fact has been emphasized that the majority of janitors are totally ignorant of boiler inspection or where to look for deterioration, and that many of them know nothing concerning the safe management of a boiler. Usually school house boilers are designed for and expected to run at low pressure, but nevertheless the inspector found numerous cases where the safety valves were stuck or overloaded, in some cases to over 60 pounds pressure. In one instance the lever of the safety valve was swung under a beam in such a way that it could not lift. The inspector cites one case, that of a large high school, where the janitor took so little interest in the boiler and its proper operation and condition that he lay upon a sofa in another part of the building while the inspection was being made. The inspector further pertinently remarks that the condition of the boiler and its surroundings was indicative of the character of the man. Everything covered with ashes and soot, a hand hole carelessly packed and things generally in a condition to rapidly deteriorate. The necessity of the best of attention and of frequent inspection was rendered startlingly evident in the case of the explosion of a boiler at the Center School, Uxbridge, Mass., upon which the inspector also reports. The effect of the explosion was to lift bodily the floor immediately above, with the children thereon. Almost miraculously no one was fatally or serlously hurt, although nearly all were injured. The exploded boiler, which had been in use about 15 years, was of cast iron, and was found upon inspection to have had an unstayed surface 28 x 40 inches, in some places less than ¼ inch thick. Apparently for years this had been acting as a more or less flexible plate under the low pressure carried until it had cracked at the bending lines, and excess of pressure upon this particular day had caused the disaster. With the evidence of such necessity for further legislation the chief renews his recommendation of the previous year for the enactment of a law regulating the use of steam boilers and for the better protection of life in the use of the same.

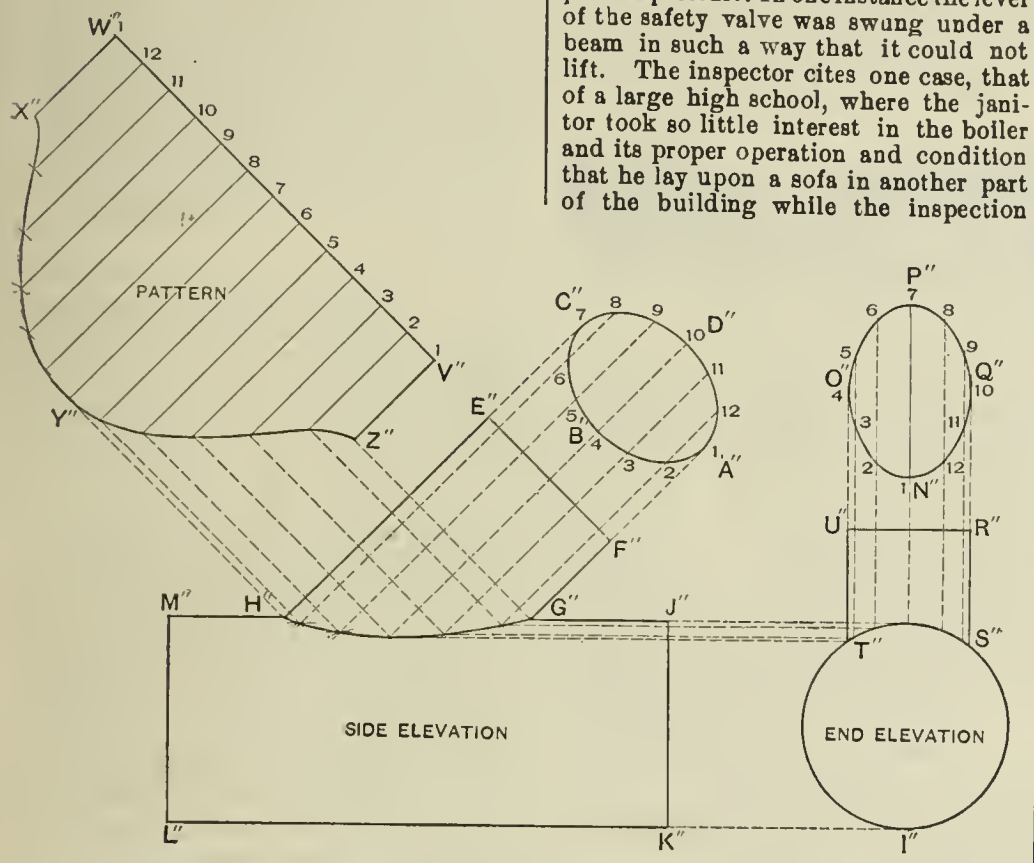
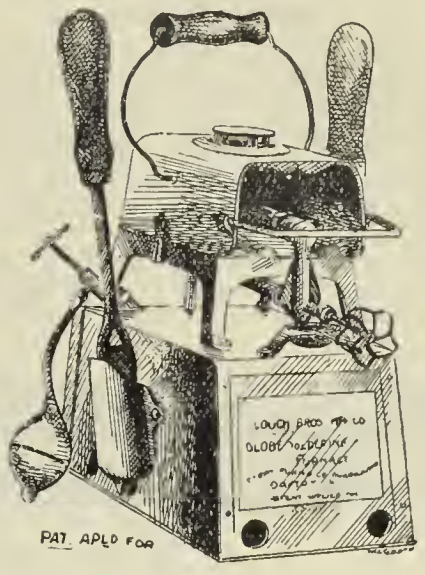


Fig. 2.—Joint Between Elliptical and Round Pipes —Second Example.

Globe Soldering Furnace.

The Couch Brothers Mfg. Company, Dayton, Ohio, are placing on the market a new combination furnace for tinners, plumbers and canning factories under the name of the Globe soldering furnace, which is illustrated in the accompanying cuts. Fig. 1 is a general view of the furnace, while Fig. 2 shows the burner. The furnace is particularly adapted for work out of doors in all kinds of weather, and the manufacturers allude particularly to the stationary generator, so arranged that the flame will light the burner from the generator, making an exceedingly hot fire. It is also noted that the burner is of such shape and construction that it will not clog up by dropping solder. The manufacturers claim that the Globe furnace by having the needle point $\frac{3}{16}$ inch from the mixing tube will save one-half of the fuel. The furnace is noiseless and is used to melt lead and heat coppers at the same time. The tank is concealed from view and is thereby thoroughly protected. The burner, it is pointed out, can be attached to any other furnace.



Globe Soldering Furnace —Fig. 1.— General View of Furnace.

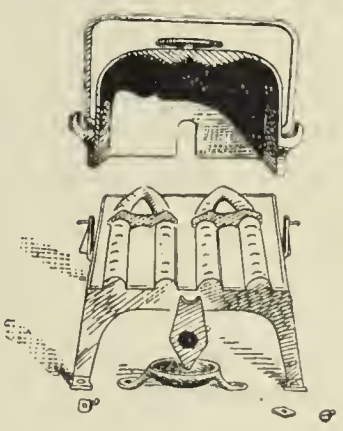


Fig. 2.—View of Burner.

A German patent has been granted to Ida Ouaglio of Berlin for a new method of coloring aluminum. The objects made from aluminum are first coated with zinc and then colored black by a solution of either platinum, copper, nickel or antimony. To protect the designs a varnish is employed.

THE RETAIL STORE.

Patent Air Blast Oven and Broiler Burner.

The Monarch Stove Company of Mansfield, Ohio, are using in connection with their Regal Monarch cabinet range for gasoline made on the generating principle, and their cabinet ranges in which gas is employed as fuel, the burner shown in the accompanying illustration. The device is known as a patent air blast oven and broiler burner. and consists of two hollow quadrilateral cast plates 12 x 4 inches bolted together,



Patent Air Blast Oven and Broiler Burner.

and having slots sawed along both edges. Through these slots or holes the air carried up from below is discharged and mingles with the gas from the burner, forming a proper mixture for combustion. The adjustment is such as to give the proper amount of air, the result being a blue smokeless flame of intense heat. By means of this burner the oven is fully heated, while at the same time broiling may be done below. The makers state that the success of the burner is found in the combination of the gas and air supplied to it.

MEMORANDA.

THE CATALOGUE issued by Emerson & Fisher, St. John, N. B, for the year 1895 is a handsome publication of over 300 pages, bound in vermilion covers, the front carrying an attractive, simple design. The first section of the publication is devoted to deep and shallow stamped wares, then comes planished tinware, followed by japanned ware, Royal embossed ware, pieced tinware, granite or gray enameled wares, white enameled ware, brass and copper ware, the latter ending the first general division of the work. The second begins with wire goods, including poultry netting, bird cages, &c. Then come wooden ware, refrigerators, miscellaneous articles, brushes, hollow ware, oil stoves, lanterns, sad irons, mouse traps, aluminum ware, cutlery, scissors, kitchen utensils, axes, hammers, hardware, the latter covering a large assortment. Toward the end attention is given to forges, farming tools, fire sets, registers, tinners' tools, &c.

THE HAUPT STOVE & HEATING COMPANY, 615 West Market street, Louisville, Ky., sustained a loss of $1500 by fire last week, which was covered by insurance.

THE ASHLAND SCREEN & MFG. COMPANY of Ashland, Wis., are erecting buildings for the manufacture of stove boards. The size of the main structure will be 45 x 100 feet. In addition there will be a warehouse 24 x 55 feet and an engine and boiler room 19 x 26 feet. The boards will be crystallized by a special process. The officers of the company are E. Moeckel, president; H. Rettinghaus, vice-president, and John Moser, secretary and treasurer.

THE GEUDER & PAESCHKE MFG. COMPANY, manufacturers of tinware, Milwaukee, Wis., now offer a full line of cream cans and cream can trimmings for the ensuing spring trade. Among the specialties they make for the dairy trade are their widely used Fairmont cream can gauges and their self-locking cream cans and self-locking trimmings, patents on which have just been granted and which they now propose to push vigorously, having lately very materially perfected their tools for the production of these goods.

GURNEY REFRIGERATOR COMPANY, Fond du Lac. Wis, are getting out a hanger 14 x 22 inches in size for jobbers' use, on which is illustrated their refrigerator, also parts of the same, and which calls attention to features of their goods. The company are bringing out a new line of soft wood (or linden wood) refrigerators which they refer to as handsome in appearance and as finished in imitation oak; the imitation being so good, it is remarked, that only a close inspection reveals the fact it is not real oak.

THE KEWASKUM MFG COMPANY have been organized at Kewaskum, Wis., with a capital stock of $10,000, to manufacture tinware and sheet iron ware. The machinery has been ordered for the factory. They will also make the Hayes clothes drainer. The officers are as follows: President, Nicholas Marx; secretary, David Rosenheimer; treeasurer, Adolph Rosenheimer.

"HOW TO SPRAY, When to Spray and What Pumps to Use to Insure the Life and Yield of Fruit Trees, Grape Vines, Berry Bushes, &c.," is the descriptive title of a neat pamphlet issued by the Goulds Mfg. Company, Seneca Falls, N. Y. It is in reality a special catalogue and price list of spraying pumps and nozzles for every service which the Goulds Company manufacture. The Standard and Star double acting spraying pump is shown and fully described and prices given. The Semi-Rotary, Clock, the All About, Sentinel, Barrel spray cart, knapsack pumps, bucket pumps, force pumps, &c., are all similarly noticed. Fittings are shown toward the end and a spraying calender prepared by the Experimental Station of Cornell University is appended.

THE CATALOGUE issued by John C. Kupferle, St. Louis, is known as the No. 7, and in it the publishers say that they have been very careful to list only such goods as are constantly carried in stock. The catalogue is a substantial cloth bound book, 10 x 7 inches in size. In the beginning is an alphabetical index, and the first articles noticed are shoe lasts; then come well wheels, hay fork pulleys, barn door hangers, clothes line reels, &c. A number of pages are given up to sad irons and other hardware, then lawn sprinklers, pump fixtures and foot scrapers. Among the goods in the catalogue in which our readers will be especially interested are sewer grates, cesspool grates, ventilating grates, cesspool and sash weights. The manufacturers particularly allude to the solidity of their goods, and mention that they have not lightened their patterns. They will be glad to mail this catalogue with price list to those who may apply for it.

HABERMAN MFG. COMPANY, Brooklyn, N. Y., manufacturers of stamped and enameled ware and tinware, have opened a spacious main office and sample room, occupying the first floor of the new building, 78 and 80 Beekman street, New York City. The firm's factories at Brooklyn and Berlin Village, L. I., are both in active operation.

T. F. AHERN & Co. of New Haven are putting up the metal ceilings and side walls in the store of ex-Mayor Sullivan's new building at Derby, Conn.

LALANCE & GROSJEAN MFG. COMPANY, 19 Cliff street, New York, favor us with their dairy goods department catalogue for 1895, a 36 page book, containing illustrated descriptions and prices of their L & G. milk cans in various patterns and milk can sundries. Special attention is directed to the L. & G. improved milk can stock, now illustrated for the first time. The last 12 pages are devoted to illustrations and particulars of milk kettles, pails, pans, buckets, dippers, strainers, measures, skimmers and other dairy requisites made by the firm in enameled ware and stamped and pieced tinware.

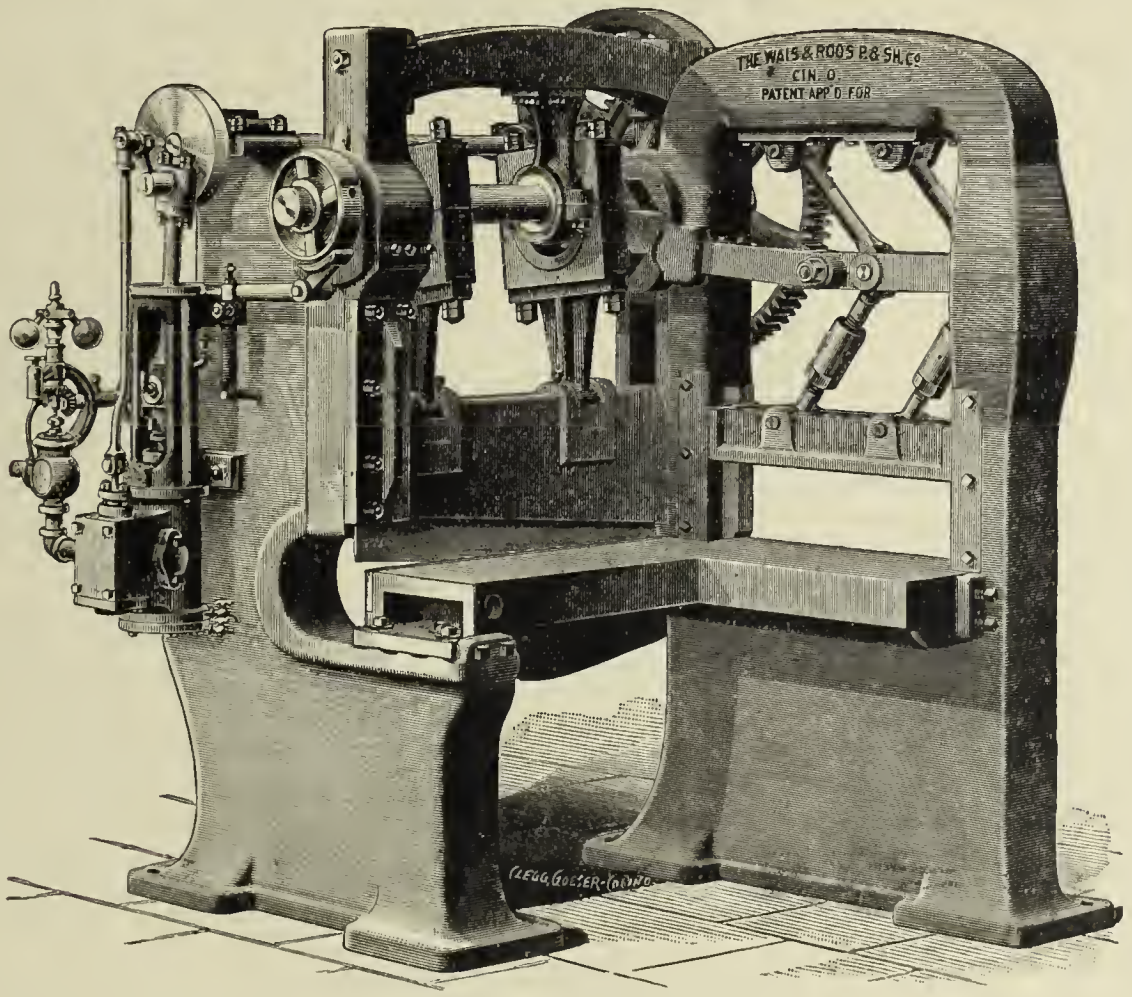
The Texas Foundrymen's Association met at Waco, Texas, on the 6th inst. The subject of convict labor formed the chief topic for discussion, and a committee was appointed to appear before the Legislature for the purpose of securing legislation which will prevent competition from the convict labor of the State with the Texas foundries. The same committee will also ask the railroads to grant cheaper freight rates upon raw material. The next regular meeting of the association will be held at Houston, Texas, May 8.

The Brooklyn Bridge trustees last week received a report from the committee on the terminal improvements, showing that the total expenditures for the work would be $2,041,913, which is over $300,000 more than the sum originally fixed on for the improvements. The expenditures include $321,327 for railway and equipments; car storage yard and real estate, $746,000; new Brooklyn station, $120,000; reconstructed New York station, $140,000; New York roadway, $107,600; cable drawing, $.92,227.69.

TIN PLATES.

Combined Tin Plate Shear and Doubler.

The accompanying cut represents a new combined shear and doubler with engine, built by the Wais & Roos Punch & Shear Company, Cincinnati, Ohio. The company, we understand, have been at work ever since the new industry of tin plate making had become an assured fact to get up a machine that would overcome all the inconveniences of the alligator patterns which had been in vogue in Europe for so many years. An inspection of the accompanying engraving will show what a simple and compact machine has been devised. The machine is illustrated with engine attached, but if desired it may be arranged for belt power. One of the principal features in its construction is that both the shear and doubler may be operated at one time or each independent of the other. The shear is the same as the latest improved gate patterns and is adapted to cut packs and trim tin plate, the knives cutting 36 inches in width. The doubler is driven by a crank from the same shaft that operates the shear and with the connection operates the toggle joints which produce a powerful though quiet running motion. The doubler opening is 28 inches wide and the head lifts about 8 inches, made adjustable by couplings having right and left threads, so that it is exactly parallel and enabling the operator to double either tight or loose as he may desire. Other advantages to which attention is directed are that it is not necessary for the operator to change position while doubling, hence he economizes time; the machine furthermore doubling very heavy metal. It is compact, takes up small space and requires a correspondingly small foundation. There are no obstructions, such as pit, cam shaft, &c., and the engine and gearing are also entirely out of the way. The manufacturers mention that the machine is made of the best material throughout, the table and working parts are adjustable and the engine, which is also adjustable, is 7 x 10 inches. When complete for shipment the machine is mounted on heavy oak skids with pipe connections all in place ready to turn on the steam, the weight being about 5400 pounds.



Combined Tin Plate Shear and Doubler.

Required Horse-Power for Tin Mills.

Opinions differ very much regarding the horse-power required to operate tin or sheet mills successfully, and ideas of correct construction are equally far apart. Bearing upon this question, some facts are presented in the shape of results obtained at the plant of the Morton Tin Plate Company, Cambridge, Ohio. The mills are three in number, 24 x 32 inches, all in one train, driven direct by a Hamilton-Corliss engine 32 x 60 inches. There are four return tubular boilers, 16 feet long, 66 inches diameter, each having 58 tubes 4 inches diameter. This steam power also operates three stands of cold rolls, 20 x 32 inches, driven by a 24 x 48 inch engine of same type. During the fourth and fifth weeks of operating this new plant, at a time when the thermometer registered 10° above to 12° below zero, although the steam pipe covering was not completed, the three mills turned out 212 tons of perfect plates. The maximum horse-power developed was 486. The maximum product of 240 tons would have been obtained but for the sickness of some skilled employees. The mills were built by the Leechburg Foundry & Machine Company, Pittsburgh, Pa.

SCRAP.

The Western Packers' and Canned Goods Association held their annual convention in Chicago last week. They represent an extensive interest in the tin plate trade, as they consume enormous quantities of tin cans in preparing their products for the market. Their sentiments with regard to American tin plate are, therefore, of much importance, especially when the fact is taken into consideration that the membership of the association is scattered

over an immense section of the West, in which the influence of manufactures and manufacturers is less directly felt than in the East. When the question of encouraging the establishment of American tin plate factories was first agitated, they were quite generally opposed to the adoption of such a policy, as they feared the effects upon their trade of an advance in the cost of tin plate which was expected. But as prices declined instead of advancing they changed their opinions, and are now overwhelmingly in favor of supporting the American tin plate industry.

The Wais & Roos Punch & Shear Company, Cincinnati, Ohio, are building a number of new machines for tinning, and have, we understand, several heavy contracts now on hand which have necessitated doubling their force in the factory.

At the plant of the American Tin Plate Company, Elwood, Ind., all the nine mills are running full time and to the utmost of their capacity, turning out about 6500 boxes of finished bright plate weekly. Over 600 hands are now employed at the works.

Announcement is made that a contract has been closed with Conner Brothers of Wabash, Ind., for the establishment of a tin plate factory at Converse in the same State.

The monthly statement of goods in the New York bonded warehouses shows that 7,294.929 pounds of tin plates, valued at $150,853, were so held on January 31, as compared with 8 511,-678 pounds, of the value of $171,010, on January 31, 1894.

The death is announced, at Elwood, Ind., on February 15, of George Banfield, father of Superintendent Banfield of the American Tin Plate Works, at the age of 80 years. The distinction is claimed for the deceased of having manufactured the first tin plate made in the United States, at McKeesport, Pa., in 1874.

Lewis Crater, Howard McIlvain and Charles A. High, all of whom are at present connected with the rolling mill of McIlvain & Sons, Reading, Pa., have organized a company to erect a tin plate plant in that city. The site, it is reported, has already been procured, and work will be begun upon the erection of the mill as soon as the season will permit. In the beginning they will not roll their own back plates, but will purchase them elsewhere, although later they may roll their own plates.

The plans are completed for the large tin plate plant of the Laughlin Nail Company, at Martin's Ferry, Ohio. The ground is being prepared and work on the foundation of the buildings is to commence as soon as the weather permits.

A number of tin plate workers formerly employed at Irondale, Ohio, have made a proposition to the Chamber of Commerce of Toronto, Ohio, looking to the erection of a tin plate mill at that place, provided a sufficient bonus can be secured to put up buildings and machinery.

The plans and specifications for the addition to be made to the New Castle Tin Plate Mill will soon be ready for exhibition to contractors.

The tin plate trade seems to have been as dull in Canada of late as it has been on this side of the border. Last week, according to *Canadian Hardware*, holders in Montreal have offered round lots of coke tin at $2.60, and it is believed that a buyer could have an order filled at $2.50 a box. Large stocks of plates are said to be held in Montreal.

The new tinning house under erection for some time by the Wheeling Corrugating Company, Wheeling, W. Va., is almost completed and will be put in operation some time this month.

Discouraged by the prospects ahead at home, a number of Welsh tin plate workers are reported to be on the eve of breaking up their homes and emigrating to this country.

Davis & Kelly, Columbia Building, Louisville, Ky., who are Southwestern agents for Ætna-Standard Iron & Steel Company, report good trade in tin and terne plates. The orders come from all parts of their territory, showing a good distribution of business.

The annual report of Thomas J. Dowling, State Commissioner of Labor Statistics, submitted to the New York State Legislature contains some interesting figures relative to the growth of labor organizations. In response to circulars sent out by the Commissioner last year, replies giving the information required were received from 689 labor unions and other similar organizations. These reported an enrollment of 155,303 names on their membership books. Compared with returns made by 580 unions in 1888, the Commissioner reaches the conclusion that there has been a steady, but by no means phenomenal, growth of labor organizations in the interval. The 580 organizations reporting then had 118,628 members. The figures given at either time are not, however, conclusive, as some associations throughout the State sent no returns and the statement does not include the membership of numerous mixed assemblies of the Knights of Labor and Federal unions affiliated with the American Federation of Labor. Making all allowances for these omissions, however, it is estimated that the actual membership of the labor unions in New York State cannot exceed 250,-000 people, a sufficiently small proportion of a working population which is more than 6,000,000. Mr. Dowling reports that "throughout all the labor organizations of the State there is a manifest unity of action to reduce the hours of labor to keep pace with the productivity of the machines."

Pennsylvania has at last begun in earnest the work enjoined upon its Bureau of Statistics, which was created by the act of 1874. Governor Hastings has appointed Capt. J. M. Clark of New Castle, a former newspaper manager, the secretary of this bureau, and Mr. Clark has entered upon the work with a will. He is visiting the towns of the State, advertising first in the local papers that he wishes to meet the mechanics of the town at the stated place, which has been procured beforehand. His object is to secure reliable statistics relating to the building trades, and he asks for the carpenters, stone cutters, masons, plasterers, painters and other mechanics to come to the meeting. He distributes blanks which ask the mechanic's opinion as to apprenticeship laws, and what he thinks of the industrial school, and a space is left for the mechanic's answers. The effect of machinery upon the hours of work and also upon wages is another of the questions asked, and the nationality of the workmen in the different industries of the State will be learned also; how many of them ever served as apprentices and for how long. The aim of the bureau is to secure information which will be of much interest and possibly of much value, both to the cause of learning and of labor. This is the first active effort made to make the State's Bureau of Statistics of any use or interest to the laboring men themselves.

Prof. Sylvanus P. Thompson, in his second Cantor lecture on the arc light, gave some interesting particulars as to its optics. Of the whole of the light generated less than 10 per cent. is delivered from the peak, and the crater might be regarded as a self-luminous area. It necessarily followed that the light given off is directly proportionate to the area of crater actually exposed to view, being greatest at an angle of 40 or 50°. Professor Thompson stated that an examination of the crater by the naked eye sometimes revealed a nebulous patch rather whiter than the rest, which seems to be in motion, and this, when examined by appropriate artificial means, is seen as a comma shaped object, which rotates round the crater at varying speeds, and not always in the same direction. Whether this was a real physical rotation of the flame or only an optical effect Professor Thompson did not commit himself to an opinion. Professor Thompson also pointed out that the arc as a transformer of energy into light gave an efficiency of only 20 or 25 per cent., the rest of the energy being transformed into heat. He demonstrated by experiment that the light from an alternate current is more equably distributed than from a direct current, but did not consider there was any difference of efficiency between the two if the same amount of energy were consumed under equal conditions.

In a furnace with stationary hearth erected at Anzin, France, to produce steel of extra welding quality for tube manufacture, the bricks for the burners and roof are made of magnesite, and special precautions are taken to prevent the accumulation of dust in the checker work by having straight passages without any projections. The chief feature of the process is the injection of cold air through the sides or roof, as well as the usual blast into the furnace to the extent of 5 to 15 per cent. of the weight of the air necessary for the complete combustion of the gas. The air jets are directed on to the metal bath by the use of inclined tuyeres, to lay bare the metal and to remove the glassy layer of slag or cinder from its surface, so as to facilitate oxidation. The air jets likewise cause an intimate mixture of the hot air and gas as they enter the hearth, and by so doing raise the temperature of the flame and direct it on to the surface of the metallic bath, the final result of the combustion being only slightly modified.

The recent impediments to ferry navigation between New York and Brooklyn, owing to ice on the East River, has drawn particular attention to the pressing need for ampler transit facilities between the two cities by means of more bridges. The present structure was only capable of accommodating the passenger traffic at the cost of extraordinary inconvenience to the public.

STOVE TRADE NOTES.

Cut Prices on Stoves.

The retail trade has recently been disturbed in certain sections of the country by cut prices on a few classes of stoves. The cuts which have been made are not of a character to influence much business at this time of the year. Dealers would not be disposed to lay in stocks now which would not be salable until next fall in order to take advantage of a slight reduction in price, which would be more than offset by the interest on the investment, cost of insurance, storage, handling, &c. It is in fact extremely doubtful if a very heavy cut would cause many stoves to move from manufacturers' hands into those of dealers. The latter would very likely be inclined to wait to see if prices would not go still lower by the time they were usually in the habit of placing their orders. This leads to the consideration of a special aspect of the case.

The most serious question called up by the cuts referred to is the menace which they present to the regular prices on standard stoves and ranges. Many dealers are asking manufacturers whether this is not the beginning of a general break in prices, and argue that the breach made in their hitherto solid front must go on until it involves the entire line. They are assured, however, that such is not likely to be the case. The great bulwark standing in the way of a general reduction is the wages paid in stove foundries. The leading item of cost in making a stove is labor. The price of pig iron was at one time exceedingly important, but that was when very high prices prevailed. In recent years pig iron has been so low that its variation in price has made but little difference in the cost of a stove from year to year. Labor, therefore, being the principal item, running from 75 to 90 per cent., is given the greatest consideration. Now the same rate of wages prevails in the general stove foundries as that existing in 1890, when everything was prosperous, No reduction has been even asked, because manufacturers could not see how that would make a bad condition of things better. It would not cause any more stoves to be sold and it would make their workmen discontented and perhaps the work then turned out would be less satisfactory, for poor wages usually means poor work. Paying the same rate of wages as in good times has actually raised the cost of stoves, because trade has been lighter and production smaller, thus concentrating general expenses on fewer goods, which has enhanced the cost of each. Stove manufacturers turning out full lines are thus realizing much smaller profits and in fact are extremely fortunate if they are able to make both ends meet at the close of such a year as 1894. They most certainly seem to be in no disposition to reduce prices on standard constructions.

A Rough Winter on Stoves.

An old resident of Dundee, Ill., who has kept a record of the weather for 57 years, states that the arctic weather of this winter has been the coldest for the longest period during that entire time. All kinds of heating apparatus have been tested throughout the West and Northwest as they never were before. Furnaces and stoves have been kept at their best, not merely for a few days at a time, but for weeks. Stove manufacturers can therefore reasonably expect that more stoves will be burnt out this winter than in any previous one. They can look forward to a largely increased trade in heaters next fall as a direct result of the terrific experience through which the country is now passing. A long succession of comparatively mild winters had bred the impression that the climate of the north temperate zone was gradually changing and that ere long its name would have to be altered to the north semi-torrid zone. That impression, however, has been rudely dispelled, and there are many people who would now vote in favor of naming it the north semi-frigid zone. It can safely be assumed that the possibilities of winter weather are now more thoroughly understood than ever before by this generation of housekeepers, and greater care will be taken next fall in making preparations for the reception and entertainment of Jack Frost.

Among these preparations will be the thorough overhauling of stoves and additions to their number, so as to heat extra rooms which were uninhabitable during a large part of this winter. Dealers who are forehanded will make their arrangements accordingly by ordering in ample time so as to get precisely what they want. There are few manufacturers with the money or the nerve to pile up great stocks of all kinds of stoves, when some kinds may not be called for to any extent. The stocks made up will be of such stoves as manufacturers think will be most salable.

Dealers who delay placing their orders until late in the season will then probably have to take what they do not want. Our readers may think this advice premature, as the buying season for next winter is remote, but the subject is one of sufficient interest and importance to be carefully kept in mind.

Death of Secretary Thomas.

At the moment of going to press news has reached us of the death of Secretary D. M. Thomas of the National Association of Stove Manufacturers, which occurred at noon, Thursday, February 21. The funeral will take place on Monday, at 2 o'clock p.m.

Stove Repairs.

BY I. OPEN.

In a short time the use of stoves for heating purposes will be dispensed with, and there is no better time to have them overhauled and put in order than when they are taken down and stored. Oftentimes this work is done by the householder, and he is not a little annoyed if he attempts to secure some repair for his stove by having to make one or two journeys to his dealer before the information is obtained by which the correct articles for repairs can be ordered from the manufacturer. If during the spring and early fall dealers in these goods would take the trouble to prepare a series of letters or articles for their local papers treating on this subject, the benefit that would accrue to the dealer would more than pay for the trouble taken. One subject that could be treated at some length is the damage that is incurred during disuse. The average person well knows that stove pipes, stoves and furnaces are more likely to rust out when connected with the chimney during the summer season than if disconnected from the chimney. They should be thoroughly cleaned and the smoke pipe either wrapped with paper or in some other way prepared to withstand the summer season. A large dealer in stove repairs in one of the great cities has been endeavoring to get some of his customers to follow his suggestions, and is surprised to find that they are not acted upon by his trade. Occasionally making a trip and having a large acquaintance, he has visited the local newspapers and investigated their willingness to print such articles in their papers if furnished them, and reports that he has met with no refusal. A letter bearing the signature of a local dealer, giving information how to order stove repairs correctly, will be read in the local paper with benefit to all

New Oil Burner.

A new fuel oil burner for domestic use has been invented by Simeon Stewart and Homer Carnes of Lima, Ohio, which is highly extolled in local journals. Stove oil, a low grade of refined petroleum, is used. It is kept in the basement and forced through the feed pipe by compressed air. The pipe is coiled in the stove, and the oil in passing through it comes in contact with the flame and is heated into a gas. Through two holes, not larger than pin points, the gas escapes into the stove into mixers where, at the point of combustion, it unites with superheated air in producing an intense flame. It is stated that there is no perceptible smell and the combustion is so perfect that every bit of soot is consumed. The best feature of the burner is the small expense it takes to operate it. A gallon of oil, costing less than 4½ cents, will run the stove ten hours. W. J. Broome of Lima has secured the sole agency, and has already completed arrangements for the manufacture of burners and tanks on a large scale.

Consumption of Gas for Heating.

One of the New York dailies gives the following account of the use of a gas heating stove as related to a reporter: "A gas stove is an unalloyed blessing, provided"—and the speaker paused suggestively. "Provided what?" "Provided you do not buy the stove from the company who are furnishing your house with gas at that particular time." "I have evolved this theory from personal experience," the gentleman continued, "and don't object to giving the details. Some time ago I bought a gas stove for my sitting room. There was a furnace in the house, but we thought the stove would be cheery and bright and an addition to the comfort of the family circle. It proved satisfactory in every respect, but the gas bills far exceeded our wildest anticipations. From the time that stove came into the house the bills gathered in size and weight until they were positively staggering. I stood it as long as I could, and then I sent and asked the gas company to come and take away the stove, that I might regain my peace of mind. I did not complain to them of the bills, I simply told them that I didn't want the stove any longer. They took it away. Then, wishing to try an experiment, I went to another company and bought me another gas stove, if anything larger than the first. This stove was introduced into my house without the knowledge of the gas company who supplied the gas, and the bills were one-third smaller. I have never pretended to account for this eccentricity on the part of the little instrument that registered the gas used. I simply relate the facts."

Gas for Cooking.

Aside from the convenience of gas for cooking the cost is a matter of interest. It is a common assertion that gas for household cooking is as cheap or cheaper than coal, and in one department of hotel cooking experience corroborates it. In one of the oldest and best hotels on lower Broadway, New York, the charcoal broiler was replaced by a gas broiler, and the patrons at once noticed that they were served quicker, claiming their steaks and chops must have been cooked in advance, though no fault was found with the quality or flavor. Some of those who were well acquainted with the proprietor had the pleasure of visiting the kitchen and watching the broiling as done by gas. A saving of about five minutes in time was reported. During one of the celebrations in New York at the time of the naval display, over 3800 pounds of steaks and chops were broiled by the gas broilers during 14 hours of one day. The broilers have six compartments, each accommodating one wire broiler about 15 inches long.

At another large hotel further up town two charcoal broilers, each 3 feet long, were replaced by gas broilers, and after a careful watch for some time a difference in the cost of fuel of $1.80 per day was shown in favor of the gas broiler. In some of the larger banks in New York a complete kitchen and restaurant is run for the employees and gas is used exclusively for fuel for boiling, broiling, roasting, and heating water.

ODD PLATES.

The Standard Lighting Company of Cleveland, Ohio, have found it necessary, owing to their rapidly increasing business, to enlarge their factory, and have let contracts for an addition to their present works which, when completed, will give their plant a frontage of 400 feet and a depth of 150 feet and will be three stories high. This new space will be largely devoted to the manufacture of gas stoves, making theirs the largest vapor and gas stove factory in the world.

The Reading Stove Works of Reading, Pa., have recently received a large order for ranges from Rotterdam, Holland. A local paper states that it is the general opinion that this demand for American stoves is the outcome of the efforts of the Philadelphia & Reading Coal Company, whose agent was sent abroad some time ago with sample stoves and anthracite coal for the particular purpose of introducing the latter. It is stated that the ranges to be sent to Rotterdam will be equipped with the same style of grate as that in use in this country.

At the annual meeting of the stockholders of the Canfield Stove Company, held in Kingston, N. Y., on Monday, February 11, the following were elected directors for the ensuing year: P. A. Canfield, V. B. Canfield, M. B. Canfield, J. M. Holmes, M. G. Holmes. The following officers were elected: V. B. Canfield of East Orange, N. J., president; M. B. Canfield, vice-president; P. A. Canfield, treasurer and manager; M. G. Holmes, secretary.

The Detroit *Free Press* recently published a detailed description of the magnificent steel yacht now being built by the Detroit Boat Works for Commodore Merrill B. Mills, treasurer of the Michigan Stove Company and also heavily interested in other stove companies. It is to be larger than any yacht thus far launched on the great lakes west of Cleveland, but will surpass all others on the lakes in the perfection of its appointments and in speed. The contractors promise a speed of 18 miles an hour. The length over all will be 132 feet, water line length 110 feet, beam on deck 17 feet 6 inches, and molded depth 8 feet 9 inches. The propelling power will be a triple expansion engine with 10, 16 and 26 inch cylinders by 6 inch stroke. The machinery is to be built to develop 250 horse-power. The interior will be lighted by electricity. The boat will represent an investment of $70,000 when completed, which is to be before July 15. Mr. Mills has attained high rank in yachting circles, his title of commodore having been regularly obtained by election to that position in the yacht club of the lakes.

The Joseph Bell Stove Works at Muncie, Ind., which had been idle for several weeks making extensive repairs, resumed work about the 1st inst.

The Fuller & Warren Company of Troy, N. Y., have issued a unique announcement calling attention to the merits of their Stewart ranges. It is in the shape of a doctor's prescription and gives the ingredients as food, water and fuel. Of the latter only a small quantity is required, while the results are given as "XLEnt." It is intimated that if the Stewart range is used regularly in the family it will prevent that tired feeling so often experienced by housekeepers. The directions accompanying the prescription are as follows: "Three times daily, before meals. Shake well before using."

The Great Western Stove Company of Leavenworth, Kan., resumed operations on the 5th inst., after having been shut down for over two months during the dull season. They expect to continue in regular operation from this time forward.

The office and warerooms of the Sill Stove Works have been removed to the office and warerooms of the Chicago Stove & Range Company, at 68 and 70 South Canal street, Chicago, Ill., one block north of the Union Depot, and on the corner of Madison and Canal streets.

A. L. Russell will represent the Danville Stove & Mfg. Company, Danville, Pa., with headquarters at 41 North Eleventh street, Philadelphia, Pa., and will travel in the States of New Jersey, Delaware and Eastern and Southeastern Pennsylvania. The company have this year added a new line of furnaces and four-hole ranges to their already large and varied line. They have secured the Eastern agency for the Monarch gasoline and gas stoves for Pennsylvania, New Jersey, New York and New England States, and have distributing depots at 41 North Eleventh street, Philadelphia, and 284–286 Pearl street, New York City.

John D. Green, the late manager of the Superior Stove Works, at Superior, Wis., has accepted a position with the Detroit Stove Works, and will travel over Southern Michigan and Northern Indiana. The principal owners of the Superior Stove Works are disposed to put them in operation as soon as practicable, and will probably make a start about April 1.

According to Government statistics just issued, our exports of stoves and ranges during 1894 attained a value of $240,936; against a value of $235,796 in 1893 and $205,348 in 1892. Our export trade thus shows growth, although it is not at a very rapid rate.

The National Vapor Stove & Mfg. Company of Lorain, Ohio, have effected a reorganization and are now ready for business.

The Peck-Williamson Heating & Ventilating Company of Cincinnati, Ohio, announce that they will open a branch house at Webster City, Ia., making it a distributing point for Iowa, Nebraska, the Dakotas, Kansas and

Minnesota. This firm have a branch house at Dayton, Ohio, one at Pittsburgh, one at Chicago and one at St. Louis. E. R. Swan will be the manager of the Webster City house.

ORSON WILSON, 199 Broad street, Newark, N. J., is selling a new draft regulator for cooking stoves. It is a casting designed to take the place of a cover and is a large register which, when open, admits air to check the draft. Satisfactory results are reported from its use.

AT THE ANNUAL MEETING of the Peninsular Stove Company, held at Detroit, Mich., a few days ago, William B. Moran was elected president for the twelfth consecutive term.

JOSEPH P. MITCHELL, at one time president of the Stove Molders' Union in Troy, died of consumption on Friday, February 8, at the age of 67 years. His death occurred in Utica, N. Y., to which place he moved about ten years ago, where he was foreman in one of the stove works.

EDWARD GRIFFITHS POWELL, vice-president of the Gobeille Pattern Company, Cleveland, Ohio, died in Kansas City February 10. Mr. Powell was born in Ohio in 1841, and served through the war, being twice severely wounded. At the close of the war he embarked in the cattle business, in which he was very successful, and was well known in this line through the South and West. While Mr. Powell did not take a very active part in the management of the Gobeille Pattern Company, he was very much interested in their success. When he died a friend said of him, "the business world lost an honest man," and this short eulogy, when truly merited, covers the highest praise.

THE ENTERPRISE STOVE COMPANY of Vincennes, Ind., recently broke ground for an additional warehouse, which has been made necessary by reason of the demands of the trade and the lack of room for advance storage.

A NEW ORGANIZATION was recently formed (?) in Cincinnati, Ohio, during the convention of manufacturers, to be known as the Plumbago Club, the following officers having been elected: J. S. Hibbs, representing J. W. Paxson & Co., Philadelphia, president; J. D. Smith of the J. D. Smith Foundry Supply Company, Cincinnati, Ohio, vice-president; H. F. Frohman and T. L. Griffith of the S. Obermayer Foundry Supply Company, Cincinnati, secretary and treasurer respectively. The principal object of the club being the enrollment of members whose veracity will pass unimpeached insures the strictest surveillance of the past record of any proposed candidate. Another clause in the by-laws and constitution adopted by the new organization is that no greater discount than 75 and 50 and 50 and 10 per cent. be allowed on any material sold. It is perhaps needless to state that this will meet with unanimous approval. After a protracted session reaching into the small hours, the first meeting closed with the understanding that another be held at the same place the last Saturday in February.

THE PENINSULAR STOVE COMPANY of Detroit, Chicago and Buffalo are distributing a circular illustrating the Peninsular wrought steel ranges for 1895. This is a completely new line which the company have brought out, and the goods are offered in any style, size or combination desired for private houses, restaurants, hotels and public institutions. The ranges are constructed o cold rolled wrought steel, are asbestos lined throughout, and the grate can be withdrawn without removing a single plate or bolt. The circular illustrating the goods is printed in colors, and the illustrations are accompanied by full descriptive particulars.

Trade Notes.

THE CINCINNATI STAMPING COMPANY, Cincinnati, are directing attention by means of an advertisement elsewhere in this issue to the Robinson World's Fair Steam Cooker. They refer to the fact that it can be used on any kind of stove with economy and advantage, and that it cooks an entire meal at one time, using but one fire, and that it is especially adapted for gas or gasoline stoves.

AMONG recently authorized corporations in Illinois are the following: Edgecombe Sash Balance & Lock Company, Chicago; capital stock, $100,000; incorporators, Charles H. Edgecombe, William J. Titley and Ernest Uhlich, Jr. Illinois Stamping Company, Chicago; capital stock, $40,000; incorporators, Charles D. Milne, Carlos A. Miller and Mendeville J. Barker. The Monarch Cycle Mfg. Company, at Chicago; capital stock, $500,000; to manufacture bicycles; incorporators, Chandler Robbins, John W. Kiser and John S. Emmert. Phœnix Telephone & Mfg. Company, at Chicago; capital stock, $100,000; to manufacture electrical apparatus; incorporators, Lee R. Brown, E. E. Yaxler and J. H. Biley.

THE AFFAIRS of the McCullough Iron Company, whose main office is at Philadelphia, have been placed in the hands of receivers, and the Girard Life Insurance, Annuity & Trust Company of Philadelphia and Henry Whiteley have been appointed and duly qualified as such. The company announce in a circular that the assets are far more than sufficient to pay off all liabilities in full in the course of time. Under the orders of the court the receivers will continue to operate the different works of the company for the present. Two days after the McCullough Iron Company passed into the hands of receivers their representatives in Philadelphia, the McDaniel & Harvey Company, made an assignment to the Girard Trust Company and Henry Whiteley. In their circular they state that the interests of the two companies were so intimately interwoven that the assignment was made as a matter of protection and precaution, to protect the interests of stockholders and creditors. The assets of the company, the circular states, are ample and much in excess of all liabilities, and creditors will be paid in full. The McCullough Iron Company are proprietors of the following works: North-East Forges, North East & Shannon Mills, at North East, Md.; Minquas Mill, Wilmington, Del.; West Amwell Mill, Elkton, Md.; Octoraro Mill, Rowlandville, Md., and the Charbon Chemical Works, North-East, Md. They manufacture Galvanized Sheet Iron extensively, also Bar Iron, their specialty being Harvey's patent cleaned Sheet Iron. The officers of the two companies are Henry Whiteley, president; Enoch McCullough, vice-president, and Huxley Harvey, treasurer.

THE ANNUAL MEETING of the stockholders of the Novelty Stamping Company, Bellaire, Ohio, was held recently and the result of the year's business was reported as being very satisfactory, although no dividend was declared. The capacity of this concern for the manufacture of railroad and tubular lanterns, stamped ware and sheet metal specialties has recently been doubled, the firm having added to their equipment a No. 14 Bliss press, at a cost of $5000. At the present time the firm have sufficient orders on hand to guarantee steady operations for the next six months.

A. MUGFORD, Hartford, Conn., has reported plans for the enlargement of his electrotype foundry, which will double his capacity in this branch, besides adding to his facilities for wood engraving, designing and printing. The alterations will be begun at once and completed as soon as possible.

POPE'S ISLAND MFG. CORPORATION, New Bedford, Mass., have just completed a new rolling mill plant for the production of their Howard non-corrosive metal, which is largely used by jewelers, metal spinners and metal workers in general.

It is said that the United Mine Workers have decided to withdraw from the Knights of Labor and reorganize on their own account. Such a movement would seriously cripple the Knights of Labor and might lead to the secession from that body of other important associations.

Out of the 27 strikes that occurred in the State of Pennsylvania last year only three were successful.

There has lately been introduced at Havre, France, a new type of steam vessel for river traffic in which the power for the propeller is obtained from a gas engine. "L'Idee," one of the first of these boats, is of 350 tons, and is driven by a vertical gas engine of 40 horse-power. The smallness of the room taken up by the engine and the ease of manipulation are referred to as the principal recommendations for the use of gas engines on shipboard. A syndicate has been formed in France for building marine gas engines.

The engineering committee of the Ohio and Lake Erie ship canal have appointed Geo. W. Lehman of Philadelphia to direct the preliminary surveys. He will have charge of the three surveying parties.

Western coal was offered in carload lots at $1.10 a ton, on the tracks, at Chicago last week, the lowest price touched since the coal war began.

The National Lead Company have declared their usual quarterly dividend of 1¾ per cent., payable March 15.

The Montreal (Can.) Chamber of Commerce are making an effort to establish a commercial museum in that city.

The J. H. Vogan Car Works of New Castle, Pa., have just completed a handsome street car for the Second avenue, New York, line, and the Conelly Gas Engine Works of New Castle have equipped the car with a gas motor. The agent of the company is now in New Castle to inspect the motor and car, and inside of a week it will be tested on the track of the New Castle Street Railway Company.

TRADE REPORT.

The Iron Market.

In spite of the continued low prices of Iron and Steel products, a more hopeful feeling is spreading among Eastern manufacturers. This is due principally to the fact that costs have been steadily crowded down, until now makers feel that they are partly safe in their own territory. This applies to Pig Iron as well as to Steel. In the latter the basic open hearth furnace has become the salvation of the Eastern maker. Pig Iron for this purpose is being delivered at a low price, while cheap Melting Scrap has been available in quantity in their territory. The result is that with modern improved practice Basic Open Hearth Steel can be produced in the East at a cost very close to the price at which Western and Bessemer can be laid down in Eastern markets. This is a phase of recent development which has inspired so much confidence that considerable improvements in rolling mill and Steel plant are either under way or are in contemplation. The trade will watch these developments with keen interest, and will divest itself of the impression, too widely prevailing, that a decadence is progressing in a section which is in reality securing a new lease of life.

It has transpired that the recent large sales of Southern Foundry Irons in the Chicago district were secured only by receding from the prices which leading Southern makers have clung to for a considerable time. There has been a fair distribution from Cincinnati.

The advance in the prices of Wrought Iron Pipe seems to have had the usual effect of causing buyers to test the sincerity of sellers by keeping out of the market.

In metals an advance in Tin is noted. Copper is weaker, while Lead has declined under the pressure of moderate sales.

Pig Iron.—The volume of business continues light in New York City and its tributary district. Consumers are shopping closely and show no hesitation in backing out of orders when bargains are offered to them by other sellers. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

Philadelphia advices indicate that a fairly good demand for Pig Iron has been met with in that market and at inside prices there is no difficulty in placing liberal amounts of material. Ordinary Irons for pipe founding, &c., are wanted at about $10, some sales having been made at that figure for water delivery, rail deliveries being held at a trifle more money. Good No. 2 Foundry X is taken at $11.25 @ $11.50, although for some brands $11 has been accepted for what is said to be a strictly first-class article. There is nothing in the immediate outlook to indicate any special change in either price or demand. Sales have been in moderate quantities at about the following prices for Philadelphia, and from 20¢ to 30¢ less for water delivery, or at points such as York, Harrisburg, &c.:

Standard No. 1 Foundry X	$12.00 to	$12.50
Standard No. 2 Foundry X	11.00 to	11.50
No. 2 Plain	10.75 to	11.00
No. 1 Soft	11.50 to	11.75
No. 2 Soft	10.75 to	11.00

Local Pig Iron has again taken the lead in sales in the Chicago market. One order was placed for 2000 tons and quite a number of others for smaller quantities. Consumers are pushing for deliveries as much as ever. Sellers of Southern Iron state that the business in sight for them has been cleaned up for the present and inquiries are now being received. The large sales of Southern Coke which were recently made here were closed at cut prices by furnace companies which have hitherto maintained a firm front. Ordinary quantities are held at our quotations. Lake Superior Charcoal has moved in carload lots only. Quotations are as follows for cash:

Lake Superior Charcoal	$13.00 to	$14.00
Local Coke Foundry, No. 1	10.25 to	10.50
Local Coke Foundry, No. 2	9.75 to	10.00
Local Coke Foundry, No. 3	9.50 to	9.75
Local Scotch	10.50 to	11.00
Ohio Strong Softeners, No. 1	12.50 to	13.00
Southern Silvery, No. 1	11.50 to	11.75
Southern Silvery, No. 2	11.25 to	11.50
Southern Coke, No. 2	10.00 to	10.50
Southern Coke, No. 3	9.75 to	10.25
Southern, No. 1, Soft	10.25 to	10.50
Southern, No. 2, Soft	9.75 to	10.25
Alabama Car Wheel	17.50 to	18.00
Jackson County Silvery	15.50 to	16.00
Other Ohio Silvery	14.25 to	14.50

There is considerable difference of opinion just now as to the prices on Iron in the Pittsburgh district for the second quarter of the year. Some in the trade believe that there will be an improvement in the second quarter, while others, equally well informed, hold the opinion that while the present heavy production is maintained there is very little chance of prices showing improvement. Foundry Irons continue in light demand and prices are unchanged. We quote as follows:

No. 1 Foundry	$10.50 to $10.65 Cash.
No. 2 Foundry	9.65 to 9.75 "

The past week in the Cincinnati market has not been marked by any large transaction in Pig Iron, and prices have continued low, but there has been a fair run of small orders ranging all the way from car lots to contracts for 600 tons, and in the aggregate from 12,000 to 15,000 tons have been distributed, and the business is widely scattered. It is certainly evident that there is a revival among manufacturing industries, but the recuperation is so gradual that it is scarcely perceptible from day to day, and it is only when the volume of business for different periods is contrasted that the improvement is realized. On the whole, the outlook is more encouraging, the weather being more favorable and recent developments gratifying. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to	$10.00
Southern Coke, No. 2	9.00 to	9.25
Southern Coke, No. 3	8.50 to	8.75
Ohio Soft Stone Coal, No. 1	14.50 to	15.00
Ohio Soft Stone Coal, No. 2	14.00 to	14.50
Lake Superior Coke, No. 1	11.75 to	12.25
Lake Superior Coke, No. 2	10.75 to	11 50
Hanging Rock Charcoal, No. 1	16.00 to	16 50
Hanging Rock Charcoal, No. 2	15.50 to	16 00
Tennessee Charcoal, No. 1	13.00 to	13 50
Tennessee Charcoal, No. 2	12.00 to	12.50

In the St. Louis market the local consumption is reported as showing a fair increase, and the demand is of a more satisfactory character than it has been for some weeks. Prices, while they do not improve, maintain a fairly steady front and are not being shaded to any extent. No. 2 Foundry is quoted at $6.76, f.o.b. cars Birmingham, and this price is not shaded, with the exception of one furnace, who are cutting the price about 10¢ ℔ ton. The fact that this furnace is in the hands of a receiver explains the price. There is no large business being placed, but the general market is kept active by the number of small sales, which vary from a carload to 400-ton lots. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.00 to	$10.25
Southern Coke, No. 2 Foundry	9.50 to	9.75
Southern Coke, No. 3 Foundry	9.00 to	9.25

Metal Market.

Pig Tin.—The strained conditions under which Straits Tin for spot delivery was made to command an unusual premium over prices at which current month deliveries were sold and freely offered, gave place to a more normal state of affairs early in the week. This resulted partly from more liberal arrivals, giving ample supplies, and relaxation of force by holders of other supply. More recently prices have advanced somewhat owing to livelier buying on speculative account, particularly for March and June delivery, and freer movement of Tin into the channels of consumption since the down turn in spot prices. There is nothing in the general statistical position that would appear favorable to a much higher level of values, since stocks are still large and the movement from the Straits quite liberal. Shipments thence during the first half of February included 350 tons to the United States, 1200 tons to London and 850 tons to the Continent, against a total of 1875 tons in the corresponding period of last year. Straits Pig in small retail parcels is quoted at 15¢ @ 15½¢ ℔ lb, the lower figure being the most common.

Copper.—The weakness of the market noted in our last report has been illustrated this week in a reduction of price by the Calumet & Hecla Company—a reduction, moreover, that was not accompanied by the customary report of more or less heavy business having been consummated. Other evidences of weakness exist in the fact that producers generally have used more effort to secure business, and in some instances shaded the popular quotation to facilitate matters, with results that are easily measured. Evidently home consumers have settled down to buying only as their requirements dictate, and the export outlet is not all that could be desired. Foreign market requirements are, in fact, filled to a considerable extent from stock

consigned by some of the mining companies. Later in the week a somewhat better business was reported in moderate amounts for home consumption. Jobbers' price for small lots of Lake Ingot from stock is about 10¼¢ ℔ lb

Sheet Copper. — Dealers report a better inquiry for Cornice Copper and orders also show a slight increase. As a whole, business compares favorably with that of last year at the same season, and the outlook for a good trade in the spring and early summer is thought to be favorable. Sheet Copper in small lots is quoted by jobbers at 14¢ ℔ lb, net.

Pig Lead.—At the opening of the week the market was extremely quiet and without any change. Spot stock was held at last week's premium, and futures were virtually neglected at old rates. In the middle of the week, however, the scene changed, with considerable offerings at the lowest recent prices. Thia weakened the market, but did not stimulate business to any degree, sales being atill unusually light and inquiry tame. American Pig in small lots from store is unchanged in price, jobbers quoting 3½¢ @ 3¾¢ ℔ lb.

Spelter.—Dealings have been very moderate here, and the demand has not improved in the slightest degree. For a time offerings were more reserved, and sellers' figures placed a fraction higher, but latterly the selling pressure revived and the apparent improvement in values disappeared. Ordinary Western brands in small lots are quoted at 4¢ @ 4¼¢ ℔ lb; the usual premium being asked on fancy brands.

Sheet Zinc.—Little or no business is being done in this material beyond purchases of small jobbing lots for present consumption. Jobbers quote 4½¢ @ 4¾¢ per pound in 600lb casks, and 5¢ @ 5¼¢ for smaller quantities.

Antimony.—No improvement in the demand has taken place and the market is rather weak. Hallett's in small parcels is quoted at 8¢, and Cookson's at 9¼¢ ℔ lb.

Nickel.—Sellers' prices are 35¢ @ 40¢, according to size of order.

Tin Plate.—With the advent of milder weather the demand in this section has developed more life and strength, jobbers reporting a gratifying increase in spot business, which, in the aggregate, compares favorably with the business lately done. Individual orders, however, continue quite moderate in size, and but little is yet being done in future contracts, except in the case of Coke Tins. Canners are reported to have lately placed some substantial orders for deliveries extending into April, but holders of Plates are not anxious to close contracts for far ahead at present low prices, usually demanding a slight advance for deliveries beyond the current month. Production on the other side is likely to be much restricted by the closing down of a large proportion of the Welsh works. On the other hand, the productive capacity of American works is being weekly increased. Prices are weak, and recent arrivals have been free.

The condition of the British Tin Plate market is described in a special London cable dispatch of February 20, to *The Iron Age*, as follows: Tin Plate has been in somewhat better demand and a fair business has taken place. Buyers realizing that prices have reached bottom are more willing to place orders, and offered a slight advance where stock was urgently required. Business has been chiefly in Oil sizes for Russia. Quotations, f.o.b. Wales, are as follows:

Bessemer Cokes, IC 14 x 20	9/	@	9/1½
Siemens Cokes, IC 14 x 20	....	@	9/4½
Ternes, 20 x 28	18/	@	23/
Charcoals, IC 14 x 20	10/6	@	13/

Sheet Iron —The increase in inquiries for both Black and Galvanized Sheets for extended delivery, referred to last week, still continues, and considerable business has been placed. Some manufacturers are not disposed to book orders very far ahead at present prices. Jobbers' quotations for small lots of No. 27 Common Iron from store rule at about 2.65¢. Galvanized Sheets are inclined to weakness in price. Small lots are quoted at the discount of 75 and 5 % @ 75 and 10 % off. The failure of one of the largest producing firms during the current week and the stoppage of their mills will cause for the time being a considerable decrease in the output of Galvanized Sheets, which may tend to stiffen prices in the near future.

Chicago Report.

Scrap.—A large movement has suddenly taken place in Heavy Steel Scrap, caused by buying orders from a leading Pittsburgh Steel company. Other material is quiet. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3 00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	...	2¼¢
Rubber	-	4 ¢

Anthracite.—The demand is excellent and dealers are pleased with the opportunity to work off their stocks instead of carrying them over into another season. Hence prices do not stiffen. Carload lots of 12 net tons or over are quoted as follows, although some concessions are now being made:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$4.75	$5 00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8 10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

CONDITION OF THE

Hardware Trade.

ADVICES from the principal trade centers indicate that on the whole the month of February thus far has not been characterized by an important increase in the volume of business, a fact which is accounted for, to some extent at least, by the exceptionally severe weather which has prevailed, interfering with travel in many sections and in some putting a stop practically to any unnecesaary outdoor activity. In some lines, however, there has been a good movement, and some of our advicea indicate a trade which, under all circumstances, should be reasonably satisfactory. The low prices which prevail are an unpleasant feature of the situation, and in this regard there seems to be as yet little indication of a general improvement, and on several lines there is much irregularity and demoralization. Competition is very active, but many manufacturers recognize the fact that prices have reached a level at which it is the part of wisdom to refrain from making further concessions. Some of the jobbing houses are making earnest efforts to prevent undue cutting of prices by the wholesale trade, but with only a moderate degree of success, and prominent jobbers are offering some lines, which they use as leaders, at very low prices. On many goods, however, they are selling at a very satisfactory margin of profit, as prices to the retail trade have not on the whole kept pace with the decline in the prices at which they purchase the goods. The cutting on the part of the jobbers is, however, having a bad effect on the market as a whole. Quotable changes in prices are, however, few. There is some complaint in regard to collections. The course of the politicians in Congress in regard to financial matters meets with almost universal condemnation from business men and elicits emphatic expressions of disapproval.

Advices from Chicago.—Shelf Hardware has recovered from the shock of the blizzard week. Mails have been coming along satisfactorily and travelers have been able to make their wonted trips with some regularity. The volume of business has consequently regained much of its former proportions, but there is still plenty of room for improvement. Orders for future shipment of seasonable goods are falling off, as prices are steady and no fear exists of either scarcity of goods or higher cost. Steel goods are in smaller demand than in previous years. They will evidently be bought as needed instead of being contracted for in advance. The Bolt market is somewhat disturbed by cut prices which are being quoted for immediate acceptance. Tinware is an exception to the general course of the Hardware trade. It is in very good demand, showing that stocks have not yet been brought up to their normal condition An unpleasant feature of the trade just now is the slowness of collections. Money appears to be getting scarce in agricultural communities. Credits are consequently being scrutinized very carefully, and new customers are obliged to make a very clear showing to get liberal treatment. The volume of business as compared with a year ago is very much better. Manufacturing consumers in country localities are buying more freely, and the outlook continues to improve, but

prices keep very low and margins are discouragingly small.

Notes on Prices.

Wire Nails.—The Wire Nail market continues, as at our last report, in excellent condition, and prices are firmly maintained by the manufacturers. The mills are fully occupied with orders and report an excellent volume of business, including some large purchases by leading houses, the demand, however, being principally for lots of moderate size, the aggregate of which is large. The market in the West is, however, to some extent disturbed by exceptionally low prices which are quoted by two prominent Chicago jobbing houses, not only for shipment from stock but also from factory in carload or less than carload lots. The prices named are lower than the ruling factory prices at the present time, even in the largest lots, and it is maintained by the manufacturers that the Nails are being offered by these houses at lower prices than they purchased the goods. Relating to this matter we have the following communication from a prominent manufacturer of Wire Nails, in which it will be observed that he suggests that the trade purchase promptly Nails which are offered to them at these exceptional figures:

There is a "fight" on in Wire Nails between the jobbers of Chicago, who are offering Nails at a lower price than they can replace them for, and one of the parties is offering to the extent of a single carload only, to one buyer, Nails at a less price than he is paying for them to day. Manufacturers are holding prices firm at 90 cents Pittsburgh and Cleveland, $1 Chicago and $1.05 East St. Louis to largest buyers for immediate shipment. As a manufacturer, I advise purchasers to lay in all these low priced Nails they can get, as I look for a further advance very soon. With 130,000 kegs less capacity a month than there was last spring, why not? The question with the buyer will be, not the price, but "Where can I get Nails?"

Advices from Chicago.—The Wire Nail situation is unchanged, although strong efforts have been made to effect a settlement of the fight between the local jobbers. The manufacturers have plenty of orders and large inquiries are being received, but buyers will not close until they see whether the Chicago price is to be advanced. Meanwhile jobbers quote 95 cents to $1.05, Chicago, for lots of any size up to one carload, the lower price being made by two houses only.

Cut Nails.—The Cut Nail market continues quiet, without change in prices. Small lots from store are held at 90 to 95 cents. With the coming of spring weather manufacturers are anticipating a marked quickening in the demand, and refer to the fact that they will enter upon the season with considerably smaller stocks than usual.

Advices from Chicago.—Only a moderate volume of business is reported by manufacturers. They state that no expansion in their trade is to be expected until the building season opens throughout the Northwest. Jobbers continue to quote small lots from stock at $1.

Barb Wire.—The Barb Wire market is steady, with a good amount of business and many inquiries. Small lots from store in New York are held at $2.15 to $2.20.

Advices from Chicago.—Manufacturers are enjoying an improving trade, with larger shipments and better inquiries. The only thing lacking to make the situation entirely satisfactory is the low price still being quoted by some local jobbers. Prices are unchanged, small lots from stock selling at $1 65 for Painted and $2 for Galvanized.

Postal Scales.—Gilfillan Scale & Hardware Company, Chicago, are putting on the market the National Postal Scale and the United States Postal Scale. The National is sold to the trade at $24 per dozen and the United States at $21 per dozen, 30 days net, 2 per cent. off ten days.

Glass.—Jobbers complain of a lack of business, and there is a slight decrease reported in the number of American Glass factories in operation. The consumptive demand for Glass is limited, and at the present time there appears to be few if any orders of a speculative character being placed. It is understood that another meeting of the Western Window Glass manufacturers will be held to arrange for a further reduction in the production of Glass and to put prices on a better paying basis. Meetings of manufacturers in the past have had this object in view, but thus far they have not been able to come to an amicable agreement. The New York market for Glass in small lots is represented by the following quotations: Single strength, 85 and 10 to 85 and 15 per cent. discount; Double Strength Glass, 85 and 20 per cent. discount. The Plate Glass situation remains unchanged. Orders are for small quantities, so that the larger portion of the Glass made is being put in stock at the factories. It is understood that the new arrangement among Plate Glass manufacturers has not yet gone into effect.

THE SWARTS METAL COMPANY, 120 West Lake street, Chicago, have changed their name to the Swarts Metal Refining Company. The change has been made in consequence of the great demand for refining. This demand has been found to be so large that the company have concluded to do their own refining, and therefore thought the new name more explanatory of their business. The company have just issued a cloth bound catalogue giving a full description of the various kinds of metal which they handle. This comprises Genuine Edison Babbitt, Edison Babbitt, Nickel Babbitt, Engine Babbitt, Nos. 1, 2, 3 and 4 Babbitt; Solder, Stereotype Metal, Spelter, Bar and Pig Tin, Antimony, Pig Lead, Electrotype Metal, &c. These various kinds of metal are described and the compositions of the several alloys are given, with recommendations as to their special use. The company carry all kinds of metals for use of plumbers, tinners, roofers, hardware dealers, electrotypers, &c. They also conduct a separate department for handling scrap metals in lines relating to the alloys and metals previously mentioned.

AT PITTSBURGH last week a rule was granted on George S. Griscom, receiver of the Moorhead-McCleane Company, to show cause why the New York Life Insurance Company should not be allowed to obtain a judgment for $350,000 against the company. On November 6, 1886, Moorhead & Co. placed a mortgage of $350,000 on their property with the New York Life Insurance Company. Later the property was conveyed to the Moorhead-McCleane Company. When the bill in equity asking for the appointment of a receiver was filed, the New York Life Insurance Company were not made a plaintiff. The latter allege that no part of the mortgage has ever been paid, and in addition they have paid $1476.03 as premiums on the fire insurance to protect their interest in the mortgage. They ask to be allowed a judgment against the company for the amount of the mortgage.

CONTENTS.

	PAGE.
Editorials:	
Chimneys	29
The Drift Cityward	29
Heedlessness	29
The Letter Box—	
A Question in Furnace Construction	30
Will It Work?	30
Thawing Frozen Street Pipes	30
An Old Stove	30
Mechanical Telephone	30
Objects to Waste and Cool Water	30
Coloring Brass	31
Wants Hotter Water	31
Is It a Good Investment?	31
Will It Circulate?	31
Gasoline Burner for Cook Stove or Range	31
A Direct Hot Water Connection	31
Plumbing and Gas Fitting—	
Allentown, Pa., Plumbers	32
Rhode Island Master Plumbers	32
New Perfection Irrigating Pump. Ill.	32
A Model Plumbing Establishment	32
Association News	33
Trimo Gas Fitters' Wrench. Illus.	33
Traps and Vents	33
Proper Location for Gas Meters	34
A Woman Plumber	34
Heating and Plumbing—New Work and Contracts	35
Steam and Hot Water—	
Master Steam Fitters	36
The U. S. Boiler. Illustrated	36
Introducing Heating Systems	36
The Eastwood Valve. Illustrated	37
Uniform Contract	37
Heating Notes	38
Roofing and Cornice—	
The Baird Snow Guard. Illustrated	39
Flashings	39
The Tin Shop—	
Pattern for Tee Joint	40
Heating and Ventilating	40
Globe Soldering Furnace. Illustrated	41
The Retail Store—	
Patent Air Blast Oven and Broiler Burner. Illustrated	42
Memoranda	42
Tin Plates—	
Combined Tin Plate Shear and Doubler. Illustrated	43
Required Horse Power for Tin Mills	43
Scrap	43
Stove Trade Notes—	
Cut Prices on Stoves	45
A Rough Winter on Stoves	45
Stove Repairs	45
New Oil Burner	46
Consumption of Gas for Heating	46
Gas for Cooking	46
Odd Plates	46
Trade Notes	47
Trade Report—	
The Iron Market	48
Metal Market	48
Chicago Report	49
Condition of the Hardware Trade	49
Notes on Prices	50
Metal and Miscellaneous Prices	51
Labor Exchange—	
Help Wanted	53
Situations Wanted	53

Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 21, 1895

Tin—
Straits pigs .....16½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX, 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 25.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade.	IC, 10 x 14	@ 5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX, 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX, 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC. 10x14.14x20	@ $4.75
IC, 14x20.90 ℔	@ 4.25
IC, 14x20. 100 ℔	4.50
10 x 20	7.00
20 x 28	9.50
IX, 10x14, 14 x 20	@ 6.00
N.Y. Grade. IC, 10x14, 14x20	@ ....

Charcoal Plates.—Terne

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $4.75
20 x 28	@ 9.50
IX. 20 x 28	@ 12.00
Worcester Brand and equal.—	
IC. 14 x 20	@ 5.25
IC, 20 x 28	10.00 @ 10.50
IX, 14 x 20	6.25 @ 6.50
20 x 28	12.50 @ 13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56	....	$12.50
XX, 14 x 56	25.50	14.00
X, 14 x 60	....	13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva
IC, 10 x 14, 12 x 12, 14 x 20 $5.37½
IX, 10 x 14, 12 x 12, 14 x 20. 6.62½

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20. $5.62½
IX, 10 x 14, 12 x 12, 14 x 20. 7.12½

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20.. 6.12½
IX, 10 x 14, 12 x 12, 14 x 20.. 7.62½
Usual extraf or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:
IC, full weight, 14 x 20 .....$5.75
IX, full weight, 14 x 20 ..... 7.50

Irondale A A:
IC, full weight, 14 x 20..... 5.25
IX, full weight, 14 x 20..... 6.75

Irondale A:
IC, full weight, 14 x 20..... 5.00

Irondale B:
IC, 100 lbs., 14 x 20 ..... 4.75
IC, full weight, 14 x 20..... 4.85

Irondale C, IC, 14 x 20, 100 lbs..... 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates.—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $5.00
Old Hundred, IC, 14 x 20, 100 lbs.... 4.75
R. W. & B., IC, 20 x 28, 216 lbs 10 00
Old Hundred, IC, 20 x 28, 200 lbs.... 9.50

Roofing Plates.

Palm, IC, 20 x 28	@ $10.00
Palm, IX, 20 x 28	@ 12.00
Empire, IC, 20 x 28	@ 10.75
Empire, IX, 20 x 28	@ ....
Hickory, IC, 20 x 28	@ 11.50
" IX, 20 x 28	@ 14.00
Alaska (heavily coated), IC, 20x28	@ 13.50
Alaska IX, 20 x 28	@ 10.50
Special, IC, 20 x 28	@ 13.50
" IX, 20 x 28	@ 16.50
Niagara, IC, 20 x 28	9.50
Iroquois, IC, 20 x 28	9.00
Westmoreland:	
IC, 14 x 20	5.25
IC, 20 x 28	10.50
Kenwood:	
IC, 20 x 28	10.00
Furmston:	
IC, 14 x 20	4.75
IC, 20 x 28	9.50
Irondale AA, IC, 14 x 20	....
Irondale A, IC, 20 x 28	10.50
Irondale B, IC, 20 x 28	10.10
Each extra cross $1.50.	
Challenge, IC, 20 x 28	10.50
Juno:	
IC, 14 x 20	....
IC, 20 x 28	....
Illinois, Old Method:	
IC, 20 x 28	13.50
IX, 20 x 28	16.50
E. L.:	
IC, 20 x 28	10.75
IX, 20 x 28	13.25
Jessie:	
IC, 20 x 28	10.25
Old Process:	
IC, 14 x 20	8.00
IX, 14 x 20	9.50
IC, 20 x 28	16.00
IX, 20 x 28	19.00
H. B. L., Old Style:	
IC, 14 x 20	7.00
IX, 14 x 20	8.25
IC, 20 x 28	14.00
IX, 20 x 28	16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.65

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 1-10¢	2 8-10¢
17 to 20	℔ 2 2-10¢	2 9-10¢
21 to 24	℔ 2 3-10¢	3 ¢
25 and 26	℔ 2 4-10¢	3 1-10¢
27	℔ 2 5-10¢	3 2-10¢

Russia, Planished, &c.

	100 lbs.
Patent Planished, ℔ ℔, A	$10.20 } 10%
Patent Planished, ℔ ℔, B	9.20 } dis
Craig's Polished Sheet Steel	8¼¢

Galvanized.

Juniata, or first quality.....dis.75&10%

Copper—

Ingot.

Lake.....11 ¢ @ 11½¢
Casting Brands..... 10 ¢ @ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Disconnt on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.
Copper, Bronze and Gilding Tube, 8¢ ℔ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)
Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 ℔ casks.....$4.75
300 ℔ casks,.....4.95
Loose sheets.....5.05

Solder—

½&½.....9¼@10¢
Extra Wiping.....8½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9½¢

Lead—

Soft Pig Lead.....3½¢
Bar.....4¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe—

1¼ and under, Plain.....70%
1¼ and under, Galv.....64%
1¼ and over, Plain.....77%
1¼ and over, Galv.....57½%
Boiler Tubes, list Oct. 24, 1892.....68%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10
Other sizes.....dis 60

Leader Pipes—

Abendroth's Galv. Spiral Riveted.. 60%
Austin's Corrugated..... 65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd..... 65%
Ritchie's Spiral Lock Seam, Galv'd... 60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated..... 65%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Disconnt from Excelsior Steel Furnace Co.'s list..... 50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	8 @ 10
Iron Paint, Bright Red	℔ D, 2
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	60¢
Linseed Oil, Raw, in bbls	58¢
Mineral Paints	2@4¢
Orange Mineral	8¢
Pure White Lead in Oil	5½@5¾¢
Dry White Lead in hhls	4¾@5½¢
Red Lead, American	5½@5¾¢
Red Venetian, English, dry	1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs	7½¢
Sipe's Japan Oil, in bbls. ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal.	35¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.40
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.00
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.25
Roofing Pitch, ℔ bbl. of 300 ℔	$2.8

NEW YORK, FEBRUARY 22, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots.....℔ D, 63¢
100-℔ lots.....℔ D, 60¢
Ton lots.....℔ D, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....℔ D, 60¢
100-℔ lots.....℔ D, 55¢
Ton lots.....℔ D, 53¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....℔ D, 55¢
100-℔ lots.....℔ D, 53¢
Ton lots.....℔ D, 50¢

Antimony—

Cookson.....℔ D, 9¼@9½¢
Hallett's.....℔ D, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.	
⅛-in. up to 2-in	$0.35	25 @ 30%
⅝-in. up to ¾-in	.36	
½-in. up to ⅝-in	.38	
⅜-in. up to ½-in	.41	
5-16-in. up to ⅜ in	.48	
¼-in. up to 5-16-in	.65	
5-16-in. up to ¼-in	1.00	
⅛-in. up to 3-16-in	1.50	
Smaller than ⅛-in.	Special	
2 in. and larger	Special	
2 in. to 8 in., no No. 19, inclusive	.38	

Copper and Bronze Tubing—
24 ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60&10%
Galvanized, Locked Joints.....60&10%
Tin.....60&10%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..18¢ ℔ ℔, net
Ingot.
Lake.....10½¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....9¾¢
Planished.....net
Sheet and Bolt.....14¢ ℔ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:
Lap or Slip Joint, Galvanized.....70&5%
Lap or Slip Joint, Terne.....60&5%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....85%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1	$0.70	.77	.82	.87	1.05 per doz.
No. 2	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.
Tin.....85%
Galvanized.....85%

Corrugated.

Flat Crimp.
Galvanized.....60%

Round or Square.
Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D 2.25	2.60¢
Nos. 17 to 21	℔ D. 2.35	2.70¢
Nos. 22 to 24	℔ D. 2.45	2.80¢
Nos. 25 and 26	℔ D. 2.55	2.90¢
No. 27	℔ D. 2.65	3.00¢
No. 28	℔ D. 2.75	3.10¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment	℔ D, 11@11½¢
Patent Planished	℔ D, A, 10¢; B, 9¢. 5%
Craig Polished Sheet Steel	℔ D 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		75&5@75& 10% off.
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig.....3½@3¾¢
Bar.....4@4½¢
Pipe.....5½¢ 20%
Tin Lined Pipe.....12½¢ 20%
Block Tin Pipe.....30¢ 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2½¢ ℔ D.

Metal, Expanded—
Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....30%
Netting, Painted Sheets.....30%
Door Mats, Galvanized.....35%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100 @ 500 ℔	5¾
Lead, Amn. White, in oil	@ 5¾
Lead, Red, hhls. and ½ bbls	@ 5¾
Lead, Red, kegs	@ 5¾
Ocher, American	@ 1½
Red Venetian, American	@ 1¾
Linseed Oil:	
Raw, ℔ gal	@ .56
Boiled	@ .59
Spirits Turpentine:	
In hhls	@ .30
Putty:	
in barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼
Roofing Material, &c.:	
Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔ ℔	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch ℔ bbl	$2.25

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 0 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe," " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2½	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained

Rosin, C. & D.....₩ bbl. $1.44@$1.45
Rosin, E. & F.....₩ bbl. $1.50@$1.60
Rosin, G. & H.....₩ bbl. $1.70@$2.05
Rosin, I. & K.....₩ bbl $2.40@$2.60
Rosin, M. & N.....₩ bbl $2.85@$3.00

Seamless Brass Tubes..net

List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr..... 3.70@ 4.00
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr..... 3.90@ 4.25
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.50@ 2.75
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½&½, guaranteed .....11¢
No. 1 .....9½@10¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢
} 5% slip.

Yager's Soldering Salts.
¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¢@4¼¢
Bertha (pure).....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers. Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....15@15½¢
Straits, pigs, ₩ ℔.....14½@15¢
Straits in bars, ₩ ℔.....15½@16¢

Tin Plates—

American Terne Plates—

N. B.—The following Terne Plate quotations are for 20 x 28, unless otherwise specified; 14 x 20 Plates are half the prices given below.

Alaska (re-squared) IC.....$13.00
Alderly, extra quality, IC.....10.75
Allegheny, IC.....9.00
" IX.....11.50
Anchor, IC.....8.25
Apollo Roofing, IC.....11.00
" " IX.....13.00
Black Diamond (Extra Coated), IC.....15.00
Bonus (Extra Coated), IC.....11.50
" " " IX.....14.50
Boston, IC.....12.50
Brooklyn, IC.....9.00
Capitol, IC.....8.50
Central, IC.....9.50
Climax, IC.....8.75
Columbia, IC.....12.50
" IX.....15 50
Columbus, IC.....9.50
Dunlap's Double Dipped, IC.....15.00
" " " IX.....17.00
" Domestic, IC.....10.00
Empire, IC.....10.25
Eureka, IC.....9.50
" IX.....12.00
Eureka, 200 lbs., IC.....9.25
Excelsior, IC.....9.50
Filbert, IC.....14.50
Flag, IC.....8.00
Florida, IC.....9.50
Flushing, IC.....12.50
Freeport (Hand dipped and Resquared), IC.....13.00
IX.....15.50
F. R. P., Extra, IC.....15.00
Globe, IC.....8.50
" IX.....11,00
Golden Star Old Style, IC.....15.00
" " " IX.....18.00
Grace, IC.....8.50
Hamilton's Best Redipped, IC.....15.50
" " " IX.....18.50
Hickory (Resquared), IC.....11 00
J. L. O., IC.....9.25
Juniati, IC.....11.50
Juno, IC.....11.00
Kensington, IC.....13.50
" IX.....16.00
Knoxall, IC.....9.00
" IX.....12.00
Laufman's Apollo (Resquared), IC.13.00
Laufman's Apollo (Resquared), IX.15.50
Leominster, Extra Coated, IC.....11.50
Lion (Stamped), IC.....11.50
Lulu, IC.....10.50
" IX.....13.50
Maple, IC.....11 00
" IX.....14.00
Merchant's Roofing Resquared), IC.15.00
Meurer's Old Method, IC.....15.00
Meurer Roofing, IC.....14.00
National, IC.....11.00
Nava, IC.....10.00
" IX.....12.50
New Castle Old Method, IC.....18.00
New Castle Palm, IC.....14.50
Old Colony, IC.....15 00
Old Method, IC.....13.00
" IX.....16.00
Osborn's Old Process, IC.....14.00
" " IX.....17.00
Osceola, Old Style, IC.....14.50
" " IX.....17.50
Pennsyl Old Method (Treble Coated), IC.....14 00
Phillips' Roofing, IC.....14.00
Phœnix, IC.....9.25
Pullman, IC.....11.50
Republic, IC.....9.50
Scott's Extra Coated (Resquared), IC.....16.00
Scott's Extra Coated (Resquared), IX.....19.00
Standard, IC.....8.50
Star IC.....10.50
" IX.....13.00
Superior, IC.....9.00
Taylor Old Style (Resquared), IC.....15.00
" " " IX.....18.00
The Taylor Roofing, IC.....13.50
" " IX.....16.50
The Osborn Roofing, IC.....11.50
" " IX.....14.00
Thomson's Puritan, IC.....11.00
Tip Top, IC (Resquared).....9.75
" IX " 12.25
Triumph, Old Style, IC.....15.00
" " IX.....18.00
U. S. Monongahela, IC.....12.20
U. S. Redipped, IC.....16.50
Venus, IC.....8 25
Waldo, IC.....11.50
Westmoreland, IC.....12.50
Willow, IC.....10.00
" IX.....13.00
Zero, IC.....9.00

American Bright Plates—

Almond, IC, 20 x 28.....$9.00
" IX, 20 x 28.....11.50
Brilliant (Tissue Packed), IC. 20x28 16.50
" " IX, 20x28.20.00
Brooklyn, IC, 14 x 20.....5.50
Century, IC, 14 x 20.....5.00
Climax, IC, 14 x 20.....4.75
Excelsior, IC, 14 x 20.....6.50
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....5.50
Florida, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Gladys IC, 14 x 20.....4.50
Hazel, IC, 14x20.....5.50
Ivy, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Linden IC, 20 x 28.....10.00
" IX, 20 x 28.....12.50
Mars, IC, 14x 20.....4.50
" IX, 14 x 20.....5.50
Merchant's Dipped, IC, 14x20.....10.00
Merlon, IC, 20 x 28.....11.00
" IX, 20 x 28.....14.00
Mint, IC, 20x28.....8.50
" IX, 20x28.....11.00
New Castle Best Palm Charcoal, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
New Castle Palm Charcoal, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.00
New Castle, Charcoal, IC, 14 x 20...6 25
" " IX, 14 x 20...7.50
New Castle, S. Charcoal, IC, 14 x 20. 6.00
" " IX, 14 x 20. 7.25
New Castle Palm Coke, IC, 14 x 20..5.75
" " IX, 14 x 20..6.85
New Castle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Oak, IC, 14 x 20.....4.75
Palma, IC, 14x20.....6.00
Pansy, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.00
Phœnix, IC, 14x20.....5.25
" IX, 14x20.....6.50
Royal, IC, 20x28.....12.00
" IX, 20x28.....15.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Walnut, IC, 14 x 20.....4.65
Youghlogheny, IC, 14 x 20.....6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$6 2
20 x 28.....12.5

Pontymister Old Style Grade, IC, 14 x 20.....6.50
20 x 28.....11.00
IX, 14 x 20.....6.50
20 x 28.....18.00
Worcester Grade, IC, 14 x 20.....4.50
20 x 28.....9.00
IX, 14 x 20.....5 75
20 x 28.....11.50
Dean Grade.—IC, 14 x 20.....4.25
20 x 28.....8.50
IX, 14 x 20.....5.50
20 x 28.....11.00
Abercarne Grade.—IC, 14 x 20.....4.00
20 x 28.....8.00
IX, 14 x 20.....5.50
20 x 28.....11.00
Mansel Grade, IC, 20 x 28.....8.00

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Caland Grade. IC, 10 x 14.....$5.25
" " IC, 12 x 12.....5.50
" " IC, 14 x 20.....5.25
" " IC, 20 x 28.....10.50
" " IX, 10 x 14.....6.50
" " IX, 12 x 12.....7.00
" " IX, 14 x 20.....6.50
" " IX, 20 x 28.....13.00
" " DC, 12½ x 17.....5.00
" " DX, 12½ x 17.....6.50
Allaway Grade. IC, 10 x 14.....4.75
" " IC, 12 x 12.....5.00
" " IC, 14 x 20.....4 75
" " IC, 20 x 28.....9.50
" " IX, 10 x 14.....5.50
" " IX, 12 x 12.....5.75
" " IX, 14 x 20.....5.50
" " IX, 20 x 28.....1.00
" DC, 12½ x 17.....4.25
" " DX, 12½ x 17.....5.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....4.25
10x20.....6.50
20x28.....8.50
IX, 10x14, 14x20.....5.25
B. V. Grade.—IC, 10x14, 14x20.....4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$11.50
IXX, 14x28..(112 sheets).....11.90
IXX, 14x31..(112 sheets).....13.25

Tinning—Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....35@30%

Troughs, Eave—See *Eave Troughs*

Trucks, Stove—

Improved Lock Frame, per doz.....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and under, Plain.....70%
1¼ and under, Galv.....64%
1½ and over, Plain.....77%
1½ and over, Galv.....68%
Boiler Tubes.....75@77½%
Screw and Socket Joint Casing.....65%
Inserted Joints Casing.....60%

Zinc—

600 ℔ casks.....₩ ℔ 4½¢
Per ℔.....5½¢

MANUFACTURING.

Iron and Steel.

The arguments in the case of the Oliver & Roberts Wire Company of Pittsburgh against the Pittsburgh Wire Company were completed in the United States Circuit Court, at Pittsburgh, last week, but no decision has as yet been rendered. The case involves an alleged infringement on a patent rod mill.

At the Arethusa Iron Works of Geo. W. Johnson, New Castle, Pa., two sets of cold rolls and two hot mills are being added and new foundations are being put under the main building.

Furnace No. 2 of the Dunbar Furnace Company, which was blown in January, 1894, after being banked nearly two years, was blown out Saturday, the 9th inst., after the most successful run in the history of this furnace. Furnace No. 1 will be blown in at an early date.

The Illinois Steel Company and the tonnage men in the billet and converter department of their Joliet Steel Works have come to an agreement, and the mills will start up about March 1. These departments of the mills have been closed since January 1, on which date the old scale of wages expired and the company proposed a new scale with a lowering of the minimum to conform to the heavy fall in prices since January 1, 1894. This the tonnage men refused to sign, and the mill was closed. The settlement now made is on the company's terms, with the exception of a special price on certain work.

It is understood that the Shenango Valley Steel Mill, at New Castle, Pa., will soon be considerably enlarged. Its entire output is steel billets, of which it is now turning out about 700 tons per day.

At a meeting of the receivers and the creditors and stockholders of the Troy Steel & Iron Company it was agreed to the appointment of a committee by the chairman to ascertain and report upon some course by which the company can be released from their present difficulties.

The plant of the Western Iron & Steel Company, at Lake View, Wash., is ready for operation. This will be the second rolling mill on the coast.

The stockholders of the Maryland Steel Company held their annual meeting at Sparrow's Point, Md., on the 13th inst. The old board of directors was re-elected, as follows: L. S. Bent, W. C. Felton, Fred'k W. Wood, W. S. Franklin and R. K. Wood. At a subsequent meeting of the directors F. W. Wood was re elected president and Edw. M. Smith secretary and treasurer.

The new wire mill of the Carpenter Steel Company, at Reading, Pa., is rapidly nearing completion. Its dimensions are 45 x 80 feet.

It is said that the Missouri Furnace Company of St. Louis, Mo., are making extensive repairs and improvements to their plant, and expect to be ready to resume operations in 60 days. The furnaces have been idle since June, 1893.

Valentine Furnace at Bellefonte, Pa., has blown out. A scarcity of ore, caused by the bad weather and drifts, and the necessity of making a few repairs about the plant, were the reasons for the stop.

Carolina furnace, at Greensboro, N. C., built in 1892, has just blown in for the first time.

The strike at the Tudor Iron Works, East St. Louis, Ill., is still on.

The old Cambridge, Mass., rolling mill and foundry have been purchased by the Chelmsford Iron Foundry Company of Chelmsford, Mass., who will utilize the plant for the manufacture of structural iron.

The Blair Iron & Coke Company of Hollidaysburg, Pa., have passed out of existence, having been merged into the Cambria Iron Company of Johnstown, Pa. The concern formerly operated No. 1 furnace at Gaysport, Pa.

As already noted, the Elliott-Washington Steel Company, New Castle, Pa., are making some extensive improvements to their plant. A building 100 x 60 feet is being added, and in which will be located the annealing and cold rolling departments. In the cold rolling department four sets of cold rolls, 12 inches in diameter and 14 inches long, one set of trimming shears and one gang slitter are being added. In the annealing department a 5-ton annealing furnace and a 175 horse-power engine, furnished by the Buckeye Engine Company, Salem, Ohio, are being put in. It is also contemplated to add a Berryman feed water heater and pump. When all improvements now under way have been completed, this concern will have a capacity for turning out 24 tons of cold roll steel per week.

As announced in these columns some time since, the Sterling Steel Company, Pttsburgh, with works at Demmler, Pa., have commenced the erection of a rolling mill. It will be 60 x 112 feet in size, constructed of iron and steel, and the contract for its erection has been let to the Shiffler Bridge Company of Pittsburgh. The Frank-Kneeland Machine Company of the same city will furnish an 8 and 12 inch mill, and Westinghouse Machine Company of Pittsburgh a 200 horse-power engine, and Fischer Foundry & Machine Company, also of Pittsburgh, a 200 horse-power engine, and R. Munroe & Son of the same city a steam boiler plant of 500 horse-power capacity.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

First-class PLUMBER with a liceuse, to take charge of plumbing business in New York City. This is a grand opportunity to the right man. "B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 23

A first-class PLUMBER, HOT WATER and STEAM FITTER; work will be more planning and iron piping; must have good refcrences, be temperate, and from New England; state age, married or single, and wages wanted. Wm. Nourse & Son, Newport, N. H. Feb. 23

At once, a first-class TINSMITH who can do a good job at plumbing, and give estimates on work; must be sober: tbe right man can secure steady work; state wages. The Clark & Jacobs Hardware Company, Danielsonville, Conn. Feb. 23

An A1 SALESMAN for bot air furnaces for Boston and suburbs; one wbo is acquainted with arcbitects and builders. "A. & B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 23

SALESMAN to sell tin and terne plates as side line in West and Northwestern States; give experience. Box 79, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill Feb. 23

SALESMAN to sell as a side line, on commission, heater pipe, elbows, stove pipe and elbows, skylights, cornices, &c., galvanized leader, eave trough. Paterson Heater Pipe Company, 238 Straight street, Paterson, N. J. Feb. 23

A first-class JAPANNER to take charge of tbe tinware japanning department in a large factory; in reply please state age, experience, salary expected, &c. "Japanner," office of *The Metal Worker*, 59 Dearborn street, Cbicago, Ill. Feb. 23

One or two good SNAP MOLDERS to work on stove plate work. Obio Stove Company, Portsmouth, Obio. Feb. 16

COMMISSION SALESMEN wanted on side line; goods sell from small samples and illustrated catalogue, mainly to hardware, house furnisbing, crockery, dry goods and bazar trades; state territory. "Staple Goods," office of *The Metal Worker*, 96-102 Reade street. New York City. Feb. 16

SUPERINTENDENT.—A gasoline and gas stove factory desires to engage a first-class man to take cbarge of its works; must have held a similar position with a leading house, be able to make calculations of cost and be fully posted on everything in the gasoline and gas stove line; none but first-class men need apply; this is a good opening for the right man. Address, with full particulars as to experience, references and salary wanted, "Executive Ability," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 16

JAPANNER—FOREMAN for japan shop in large Western city; must be thoroughly conversant with modern methods of japanning tinware, and be a good manager. Address, giving references, and stating salary wanted, "Japan," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

At once, a good sober man who can prove himself a first-class TINNER by bis work and is able to do a good job on iron pipe work; the right man can secure steady work. J. S. Barton, Abingdon, Ill. Feb. 16

A first-class JAPANNER on carriage lamps; a good position is open to a man who knows his business. M. T. Gleeson Mfg. Company, Columbus, Ohio. Feb. 16

SITUATIONS WANTED.

By practical TIN and SHEET METAL WORKER; also practical hot air furnace setter; can furnish tools and machines. John Gerkin, 1728 Graceland avenue, Indianapolis, Ind. Feb. 23

By a first-class PLUMBER and PIPE FITTER; strictly sober and steady, with years of experience; having been in business, can do estimating; would prefer work in New York or New England States. "Plumber," Box 603, Great Barrington, Mass Feb. 23

Twelve years' experience in the heating, plumbing and general hardware business; competent to estimate from plans; able to superintend steam, hot water or furnace work; I wish to secure a position in some growing town or city where ability will count; can give first-class references; have been with one concern 12 years. "Work," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 23

As TINNER, HELPER or GENERAL MAN in a hardware, stove, tin store or shop; four years' experience; best of references; sober, reliable and steady. "Jack the Tinner," 319 Main street, Keokuk, Iowa. Feb. 23

By a young man, 29 years old, married and strictly sober, with some good house in the plumbing, steam heating jobbing business as SALESMAN, either traveling or inside; for the past 14 years connected with that business, and for the past five years connected with the wholesale trade; am practical—can take a set of plans and specifications and figure from them; should like to correspond with any good house looking for such a man. W. K. Morrison, 1129 East Washington street, Syracuse, N. Y. Feb. 23.

By a CORNICE MAKER and TINNER, who also understands plow pipe work; capable of cutting patterns, working from plans and details and erecting C. W. Bentley, 924 South Division street, Grand Rapids, Mich. Feb. 23

A competent HOT WATER, STEAM, and HOT AIR ENGINEER would like position with retail house in city to take charge of selling, erecting and generally superintending work. "E. No. 223," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 23

By TINSMITH and FURNACE WORKER; young mechanic 24 years of age, accustomed to general work. "Mechanic," care Bedford Heating Company, 2 McDonough street, Brooklyn, N. Y. Feb. 22

By a TINSMITH and GENERAL WORKER, at inside and outside work. Joseph Gleacher, 3150 Third avenue, New York City. Feb. 23

By the year, by single man who has had six years' experience as TINNER; good at roofing guttering, furnace and job work and clerking; can speak German, Englisb and French; furnish the best of reference. Lock Box 1338, Barraboo, Wis. Feb. 23

By a young man 29 years of age, at PLUMBING, TINNING and IRON PIPE JOBBING; good habits. "Plumber," 160, Walnut street, Bloomfield, N. J. Feb. 23

By a TINSMITH and ROOFER; can also work on bar fixtures; ten years' experience; city or country. Sam. Kessler, 177 Norfolk street, New York City. Feb. 23

By a TINSMITH who understands all branches of the trade; also gas fitting and pump work; willing to work in the shop or out, and clerk in store when needed. Chas B Garrison, Bridgeton, N. J. Feb. 23

By young man; 14 years in the hardware trade; a willing worker and good salesman; Al references. "McL. F.," Morgan and Summitt streets, Alliance, Ohio. Feb. 23

By a young married man, wbo has bad five years' experience at the tin business, botb in city and country; strictly temperate; good references; some knowledge of plumbing and gas fitting. Fred. Dutcher, Forestville, N. Y. Feb. 23

"Hustling Yankee" can furnish the highest references; has had ten years' experience as bead salesman in a jobbing and retail bardware, stove and tinware house; wants position with a reliable house in one of the above lines as TRAVELING SALESMAN. "Hustling Yankee," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 23

As FOREMAN in cornice shop; can estimate from plans; also a first-class CUTTER and DRAFTSMAN. Box 702, Hastings, Neb. Feb. 23

By a first-class TIN and SHEET IRON WORKER; 20 years' experience; specialty, hot air and hot blast heating and ventilating work for the last ten years; at present time foreman for a large firm in Milwaukee. Wm. Schmidt, 697 Twelfth street, Milwaukee, Wis. Feb. 16

By a young man, 22 years of age, as SHIPPING or ENTRY CLERK; city or country; accurate, honest, temperate, rapid penman; knowledge of plumbing and hardware; can give bond. A. E. MacLean, Tremont, New York City. Feb. 16

A RETINNER of wide experience and well posted in all lines, and of progressive ideas and up to the times, desires a situation where energy and ability can be appreciated; first-class references. "Progress," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 16

In a foundry, by a STOVE PATTERN MAKER and CARVER, with 20 years' experience; competent to make the patterns, including the carving, with mechanical and ornamental designs; fair wages. A. Genius, 426 John street, Lansingburg, N. Y. Feb. 16

Steady position wanted by a first-class LEAD BURNER and TINSMITH. "R. L.," 229 Tenth avenue, New York City. Feb. 16

By a young man 22 years of age, as TIN ROOFER, CORNICE and SKYLIGHT MAKER; moderate salary; New York City preferred. T. Kesler, 88 Willett street, cigar store, New York City. Feb. 16

Manufacturers of OIL and GASOLINE STOVES, after March 1 I will be at liberty to push the sale of any line of gasoline stoves in any territory; my record and ability for your inspection. Abe Lincoln, Jr., South Bend, Ind. Feb. 16

FOUNDRY FOREMAN open for an engagement in New York or vicinity; 15 years' practical experience as foreman on stove plate, bench and jobbing work; best of references. "C. W. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

By a good TINSMITH at outside work; can speak English and German; wages moderate; city or country. H. Marcuse, 175 Harrison avenue, Brooklyn, N. Y. Feb. 16

By a PLUMBER, STEAM and HOT WATER FITTER, wbo can do tin and galvanized iron, furnace and pump work; estimate on work from plans or can make plans for any of the above work; first-class workman; reference. W. H. La Fleur, 312 Horsman street, Rockford, Ill. Feb. 16

MECHANICAL SALESMAN open for engagement in New York and vicinity for furnace, range and stove line, &c. "Salesman," 827 Harrison street, Newark, N. J. Feb. 16

By a PLUMBER, STEAM, GAS and HOT WATER FITTER, with knowledge of other work, a steady job; a good mechanic in every particular. Frank Slingland, West Haven, Conn. Feb. 16

By a first-class PLUMBER, ten years' practical experience, steady position wanted in any part of the United States; can furnish Al reference. Jas. P. Godsill, 1073 Third avenue, New York City. Feb. 16

By a boy, 19 years of age, wbo has bad four years' experience in a tin shop; would prefer a place where he can learn the plumbing trade; excellent references; willing to work for reasonable wages. Wm. Wittenberg, Tell City, Ind. Feb. 16

By an experienced man who understands galvanizing and retinning all kinds of stamped and hollow ware and milk can trimmings; 20 years' experience; best of references from the East or Chicago; can take charge of a plant of any size. Jno. J. Duffy, 1189 Congress street, Chicago, Ill. Feb. 16

By a good GENERAL JOBBER at tinning, plumbing ane heating; eight years' experience; 24 years of age; references; position desired by April 1. H. Ridge, Katonah, N. Y. Feb. 16

As ASSISTANT FOREMAN in a first-class cornice shop; thoroughly competent; expert on brakes, good on raised work, first-class on skylights; wages moderate; steady position at inside work wanted. Thos. J. McNamara, 256 Ewen street, Brooklyn, N. Y. Feb. 16

By a TINSMITH HELPER; two years' experience; would like to finish trade; wages moderate. J. Ratigan, 1040 Atlantic avenue, Brooklyn, N. Y. Feb. 16

As SALESMAN, or to take charge of a heating department in steam, water, combination or warm air; would take the management of a plumbing and heating business. "Experience," No. 216, office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

By a young man 23 years of age, who bas had five years' experience at tin and sheet iron work, stove repairing and the house furnishing goods business; fair knowledge of plumbing; steady position wanted with responsible parties; best of references. F. W. Thomas, 436 East Jefferson street, Williamsport, Pa. Feb. 16

On or before April 1, by a steady, strictly temperate and reliable TINNER, with five years' experience on roofing, spouting, pumps, farm implements and general work; furnace work a specialty; good references; Illinois, Indiana or Kentucky preferred. W. A. Salter, Nora Springs, Iowa. Feb. 16

By a TINNER; 18 years' experience at all branches of tin and furnace work; sober and steady. James Porter, 164 Ft. Wayne avenue, Indianapolis, Ind. Feb. 16

By a good METAL WORKER who understands the gas fixture business; 25 years' experience; best of references. "G. D." office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

MECHANICAL ENGINEER, well up in machinery, steam engineering, foundry work, &c., would like to take charge of mechanical department of trade paper—answering inquiries, working up general matters of interest to mechanics, engineers, &c; journals needing such assistance address "Engineer," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 16

Special Notices.

FOR SALE.

A full set of iron patterns, all fitted, for manufacturing Numbers 14, 16, 18, 20, 24 Round Oak Stoves, latest improved designs. Also three sizes Cannon Stoves, all fallow boarded. Address

MARSHALL FURNACE CO.,
Marshall, Mich.

FOR SALE.

First-class set of Tinners' Tools. Price, $225 cash. Inquire of

JOSEPH F. HAINES,
Rogers City, Mich.

WANTED.

To open correspondence with parties in Chicago or West who can handle Hot Air Furnaces and Hot Water Heaters in carload lots. Goods of Eastern manufacturer and well known. Address

"HOT AIR,"

office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

Patent Steel Roofing, with the necessary tools for applying electros for advertising, &c. Trade established. Good opportunity now open. Reasons can be given on application. Address

"COLUMBIA,"

office of *The Metal Worker*, 96 102 Reade Street, New York.

FOR SALE.

The leading stove store in a growing manufacturing city of 20,000, near New York. This is an old, and the best business stand in the city. Large store and moderate rent We do Steam and Hot Water and Hot Air Heating, Plumbing and Tinning. This is a good investment, but present owner has too much other business to see to. Can inventory down to $3000. Address "A. A.," No. 119 office of *The Metal Worker*, 96-102 Reade St., N. Y.

$2000

will buy a full stock of Stoves and House Furnishing Goods with complete sets of Plumbers' and Tinners' Tools, also good stock of Iron Pipe, Fittings, &c. Location the best. Town good. Stock can be reduced some if desired. Purchaser has control of entire Plumbing trade. Best reasons for selling. Business was established in 1865. Address "RETIRED," office of *The Metal Worker*, 96-102 Reade St., N. Y.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

A paying Hardware, Stove and Tinware business finely located in New England. Stock comprises a full line of Hardware, Paints, Oils, Tinware and Woodenware Have good trade in Steam Fitting, Plumbing, Tin and Sheet Iron work. Exceptional inducements will be offered to right man. Address

"EXCEPTIONAL"

office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

Special Notices.

FOR SALE.

No. 7 Sturtevant Blower, only short time in use. Address

EUGENE MUNSELL & CO.,
218 Water St., New York.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.

PATENT PRACTICE EXCLUSIVELY.

References Furnished on Application.

E. B. STOCKING, Attorney at Law
611 F ST., N. W., WASHINGTON, D. C.

ESTABLISHED 1853.

HOWSON & HOWSON

Counsellors at Law,
Solicitors of Patents

OFFICES:

PHILADELPHIA,
Forrest Building, 119 S. 4th St
NEW YORK,
Potter Building, 38 Park Row
WASHINGTON,
Atlantic Building, 928 F. St.

Special Notices.

BARGAIN.

On account of death, a set of Peck & Stow Tin and Roofing Tools for sale at a big bargain for cash, to settle the estate Write at once to ED. BLIZZARD, Wauseon, Ohio.

FOR SALE.

Cast Iron Patterns of Furnaces, Ranges and Fire Place Heaters as follows: 11 sizes Furnaces, 4 sizes Ranges, 1 size Fire Place Heater. Address

ALVA HUBBARD & CO.,
Baltimore, Md.

Helper Fire Pot

FOR PLUMBERS' AND TINNERS' USE.

A Combination of Fire Pot and Torch.

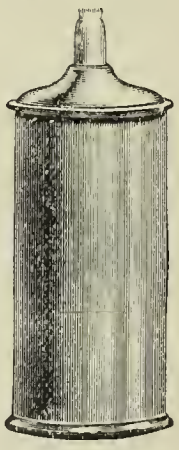


The only pot where the burner is on a swivel and patented.

The only fire pot with 16 gauge brass tank. All our goods guaranteed.

SEND FOR CATALOGUE.

UNION HEATER SUPPLY CO,
88 Congress St, East, Detroit, Mich



This little Torch is 4 in. high and 1¼ in diam and is designed to do away with the greasy candle. Will burn gasoline or kerosene oil.

Sold by All Jobbers.

Kendrick Valve & Washer Co.,
SYRACUSE, N.Y.

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address

"STOVE FOUNDRY,"

Office of *The Metal Worker*, 96-102 Reade Street, New York.

Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

HOW TO KEEP A STORE.

By S. H. TERRY.

406 PAGES, 5x7½ INCHES.

This book should be in the hands of every one interested in the selling of goods at retail. Among the subjects discussed are: The selection of a business; choice of a locality; buying a stock of goods; examining, marking and arranging goods; how to advertise; employment of clerks; selling for cash and credit; keeping accounts; expenses; copartnerships; losses by fire, theft, &c.; influences of social life on business; buying at auction; investment of profits; insolvency; business qualifications. Every branch of the retail trade is treated upon in a direct, business-like manner. It is a thoroughly practical book for merchants and clerks. **Price, $1.50.**

Sent, postpaid, on receipt of Price, by

DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, N. Y.

The Packard Enameling Co.,



400 NORTH AVE.,
Warren, O.
——MANUFACTURERS OF——



Plain, Stained and Enameled Handles, Knobs and Pail Woods.

WRITE US FOR CATALOGUE AND PRICES. OUR WORK EXCELS.



The largest and best assorted stock in America. All requisites for the draughting room. We have made a study of this line and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable.

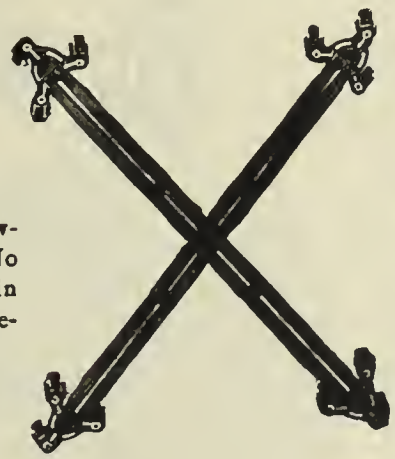
CATALOGUE ON APPLICATION.



THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.





SOMETHING NEW.

The Little Giant
Steel Truck.
Strong,
Light.

ENTIRELY OF

METAL AND AT A VERY
LOW PRICE.

Write for Circulars and Prices to the Manufacturers,

THE G. L. VAN NAMEE MFG. CO.,

Gouverneur, N. Y., U. S. A.

MICA

NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

NEW HAMPSHIRE
MICA
IS THE BEST.

The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.

MICA

MICA OF ALL GRADES
——FOR——
STOVES and Mechanical Purposes.
PALERMO MICA CO.,
Miners and Importers and Wholesale Dealers,
S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Prop.,
88 Fulton St., N. Y.

CLAD'S

Iron Enameled Ice Cream Cans.



Do not buy Cans until you get our prices. We are Headquarters.

CLAD'S

Ice Cream Dishers and Measures.



Millions in use. Seamless cups, will not rust, German Silver knives; and not tin knives. Cream will not stick to sides. Sizes standard.



WRITE FOR PRICES.

V. CLAD & SONS,

MANUFACTURERS,

117-119 So. Eleventh St., Philadelphia.

ROYAL

WASH BOILER HANDLE.



PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,

116 N. 2d St., PHILADELPHIA, PA.

The Crystal Valve Oil Can.

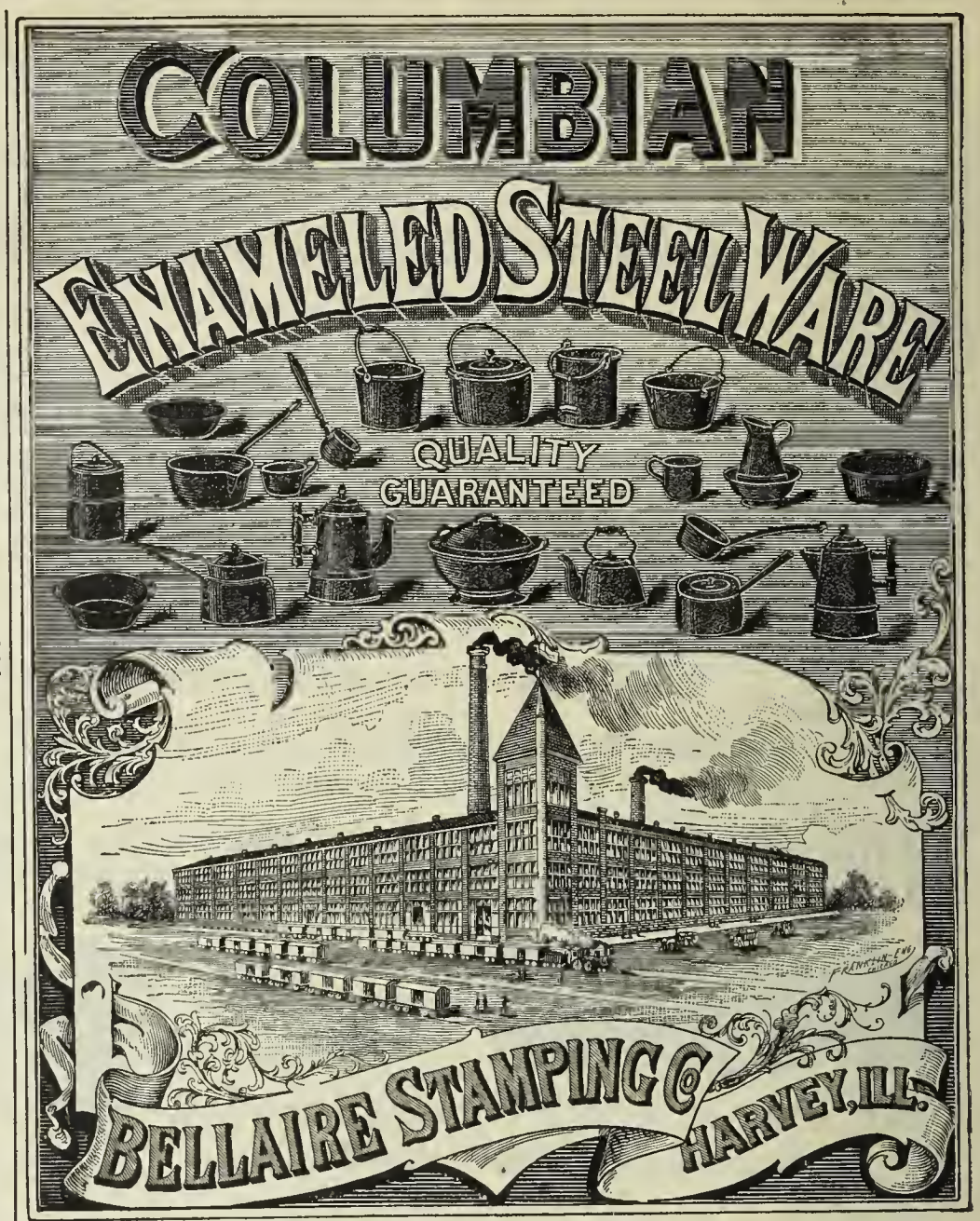


The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O,



DRAWN STEEL SINKS

Anchor and Diamond

Brand

—MANUFACTURED BY—

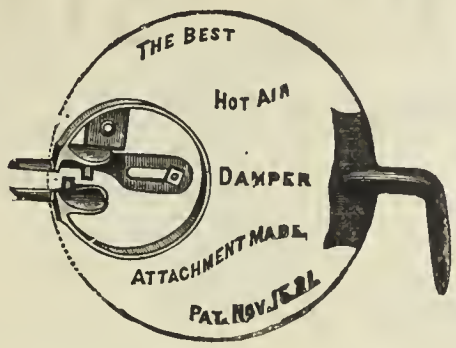
L. Wolff Manufacturing Company,

GENERAL OFFICES, 93 W. Lake Street, Chicago.

Write for Illustrated Price-List Just Published.

Crown Damper and Crown Damper Attachment.





NICKEL PLATED HANDLE. PUT UP 1 DOZ. IN A BOX.

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

AMERICAN Dampers and Clips.

WAFFLE IRONS.

THE BEST

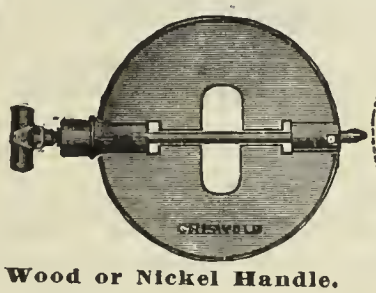


For Gas or Gasoline Stoves.

Easy to Clean, Long Wood Handles.

BUY *NO OTHER.*





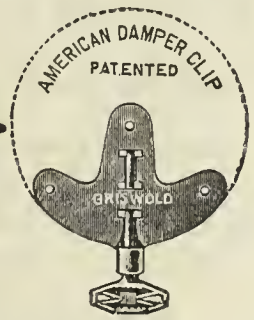
Wood or Nickel Handle.

BEST SELLER.

ASK FOR THE

AMERICAN.

Buy no Other.



JUST OUT.

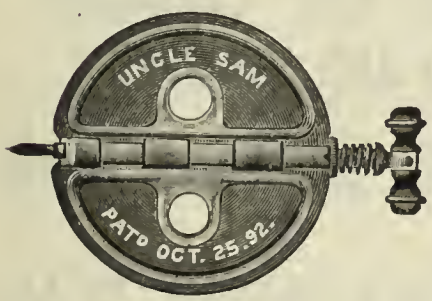
BEST CLIP MADE.

Send for Samples.

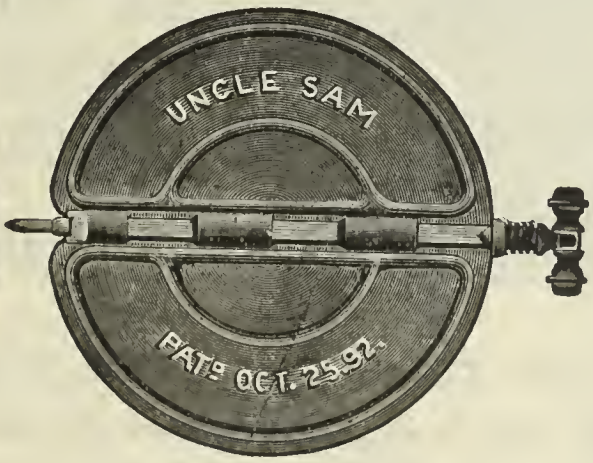
GRISWOLD MFG. CO.,

ERIE, PA.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers



W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.

Manufacturers of

Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.



SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

43 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

DAVID WILLIAMS,

PUBLISHER,

96-102 Reade St., New York.

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,

Planished, Britannia, Galvanized and Japanned

Sheet Iron Ware,

Stove Boards, Elbows, Etc.

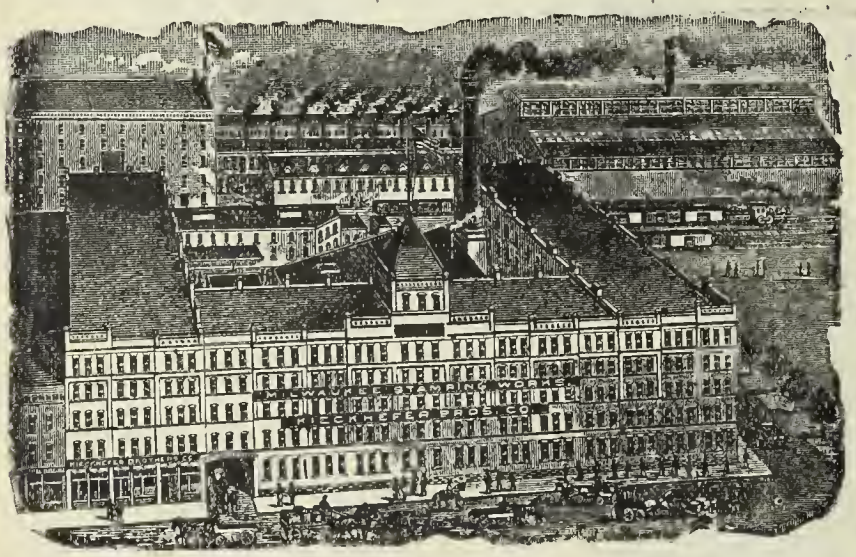


Agents for SPLENDID OIL COOKING STOVES and MAJESTIC OIL HEATING STOVES.

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED, JAPANNED AND ENAMELED PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., **MILWAUKEE, WIS.**

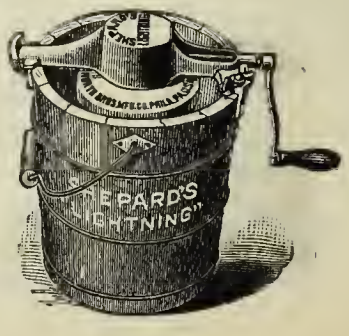
SEND FOR CATALOGUE AND PRICES.

WE CHALLENGE THE CLAIM



THAT ICE CREAM CAN BE FROZEN
ANY MORE QUICKLY
IN ANY FREEZER MADE
THAN IN OUR

"LIGHTNING" or "GEM."



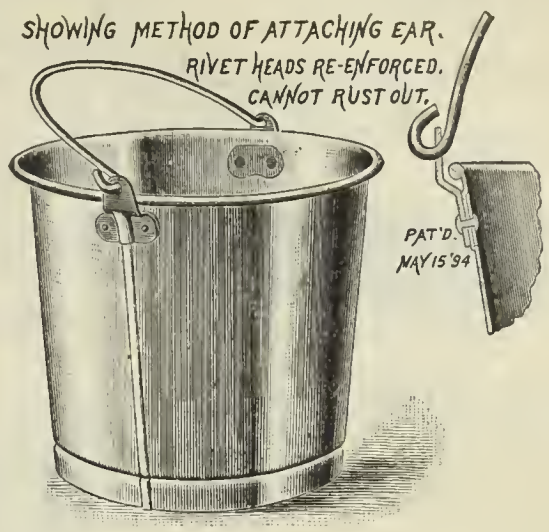
NORTH BROS. MFG. CO., Philadelphia, Pa.



LATEST "ROCHESTER."
Patent pending.



"ROCHESTER."
Patented.



WRITE FOR OUR

It is full of Good Things!

1895

CATALOGUE.

One of these will last a lifetime!

WILL BE A GOOD YEAR IF YOU HANDLE "ROCHESTER" GOODS.

LARGEST LINE. LATEST PATTERNS.

NOTE.—It has always been our aim to furnish the **best goods** at prices which are as low as is consistent with first-class workmanship.

Have you seen our new line of "**extra heavy**" nickel plated copper tea kettles? They will help hold your trade. **White satin finish inside.**

ROCHESTER STAMPING WORKS, - - ROCHESTER, N. Y.

"PRINCESS" CHILD'S TRAYS.

PATENTED.



Fitting closely around body of child, and with high protection in front, it gives perfect protection to the child, and prevents soiling of table-cloth and carpet.

MANUFACTURERS FULL LINE

STAMPED, JAPANNED AND PLAIN TIN WARE.

KEEN & HAGERTY, SOLE MANUFACTURERS, BALTIMORE.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

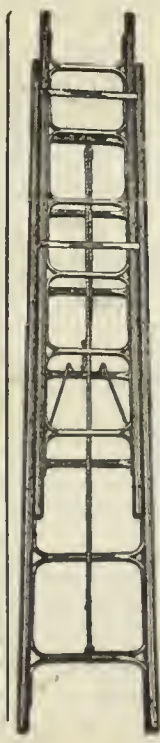
Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

SLATE

FOR **ROOFING** AND BLACKBOARDS.
SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS.
AULD & CONGER,
100 EUCLID AVE., CLEVELAND, OHIO.



Look at this Ladder.

THE PATENT BENT RUNG LADDER.

The Strongest, Lightest and Best Ladder Made.

A sixteen-foot ladder only weighs 21 pounds. Extension ladders of this kind are easily put up and taken down by a boy. Our double and single step ladders have no equal. A six-foot step ladder will carry 1000 pounds, and will last three times as long as the old style step ladder.

Write for catalogue and price-list.

Indiana Ladder Co.,

INDIANA, PENNSYLVANIA.

"We are Advertised by our Loving Friends."



Pat. Jan. 19th, 1895.

Look Here,

Hardware and Housefurnishing Dealers. An article you **must** keep is the wonderfully popular

Crusty Bread Pan.

The most perfect bread baker ever made. Every lady trying it acknowledges that. **Tests make customers** for this pan, and **that is a fact.** The Clark-Sawyer Co., a big Department Store of Worcester, Mass., say: "They are a good thing, and will make their own way, if people can be made to give them a trial." Your jobber must be in the list below. Write them for prices. They all carry this popular pan in stock.

MADE ONLY BY

The Niles Mfg. Co.,

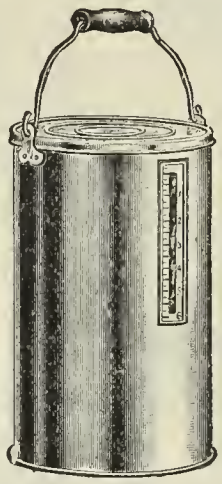
NILES, OHIO.

HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ill.
HORTON, GILMORE, McWILLIAMS & CO., Milwaukee, Wis.
WM. FRANKFURTH HARDWARE CO., St. Paul, Minn.
JOHN PRITZLAFF HARDWARE CO., Winona, Minn.
FARWELL, OZMUN, KIRK & CO., St. Louis, Mo.
R. D. CONE CO., Kansas City, Mo.
A. F. SHAPLEIGH HARDWARE CO., St. Joseph, Mo.
RICHARDS & CONOVER HARDWARE CO., Denver, Colo.
WYETH HARDWARE & MANUFACTURING CO., Council Bluffs, Iowa.
THE GEORGE TRITCH HARDWARE CO., Davenport, Iowa.
EMPKIE-SHUGART CO., New Orleans, La.
SICKELS, PRESTON & NUTTING CO., Atlanta, Ga.
A. BALDWIN & CO., Limited, Nashville, Tenn.
PHILLIPS & BUTTORFF MANUFACTURING CO., Louisville, Ky.
STRATTON & TERSTEGGE, Cincinnati, Ohio.
THE F. H. LAWSON CO., Indianapolis, Ind.
VAN CAMP HARDWARE & IRON CO., Detroit, Mich.
STANDART BROTHERS, Cleveland, Ohio.
THE GEO. WORTHINGTON CO., Pittsburgh, Pa.
THE McINTOSH-HUNTINGTON CO., Buffalo, N. Y.
L. H. SMITH WOODEN WARE CO., Limited, Utica, N. Y.
WALBRIDGE & CO., Elmira, N. Y.
CHARLES MILLAR & SON, Philadelphia, Pa.
BARKER, ROSE & GRAY, New Haven, Conn.
SHIELDS & BROTHER,
C. S. MERSICK & C

CREAM CANS

. . . AND . . .

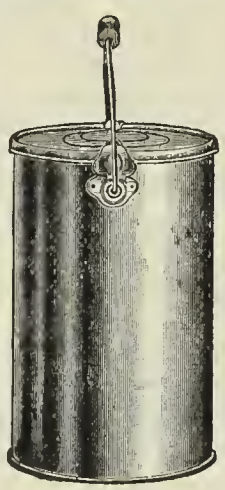
Cream Can Trimmings.



Cream Cans

With Plain Covers.
With Deep Covers.
With Extra Deep Covers.
Self Locking.

Fairmont Cream Can Gages.



Cream Can Trimmings.

Cream Can Bottoms—IX, IXX, IXXX.

Cream Can Covers—Plain, Deep, Extra Deep.

Self Locking Trimmings—Ears and Lugs; Ears, Lugs and Bails.

The Geuder & Paeschke Mfg. Co.

Manufacturers,

MILWAUKEE, WISCONSIN.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

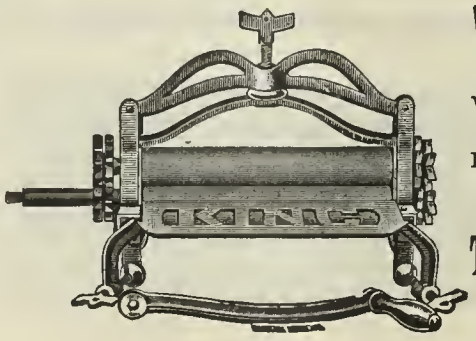
Weight, 16 ounces.
Length, 10 inches.

Can be sold in all seasons.

Write to Manufacturers for Prices.



WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.
Boston Office, H. F. Livermore & Co., 34 Oliver St.

"NEVER-BREAK" STEEL HOLLOW WARE



WON'T WARP.



WON'T WARP.

STEEL SPIDERS, GRIDDLES, KETTLES, MASLINS, ETC.

Send for Catalogues of all our lines and Discounts.

THE STANDARD FOR WEIGHT, FINISH AND PRICE.

IMMEDIATE SHIPMENTS GUARANTEED.

The Bronson Supply Co., New York and Cleveland.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

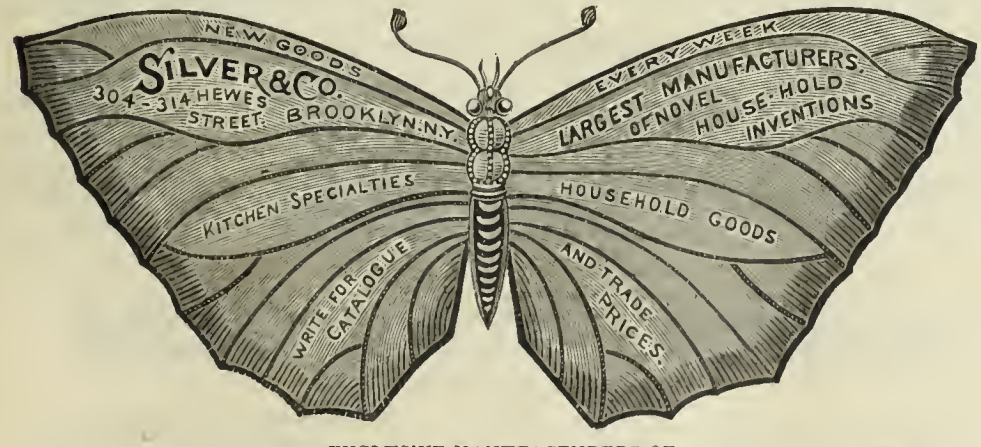
Write us for Catalogue and Prices.



ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.



EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES,

"MARION HARLAND" Tea and Coffee Pots and Urns.

Royal and Crown Roasters and Bakers.

Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses,

Steam Cookers, Milk Sterilizers, Bread and Cake Pans,

Display Stands and Household Novelties.



When In Need of

FINE STOVE PLATE FACINGS,

Write to the **originators** and **headquarters** for prices and trial samples.

THE S. OBERMAYER CO., - - - - Cincinnati, O., and Chicago, Ill.

MANUFACTURERS OF

Foundry Facings, Supplies and Equipments. Importers and Refiners all grades Plumbago.

Catalogue and special circulars sent on application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

It Beats



anything you ever saw as an Egg Beater, does it thoroughly in one minute. Beats, strains, measures and a host of other things it does. The best seller ever introduced. Is clean and very cheap.

Write for Prices in Lots.

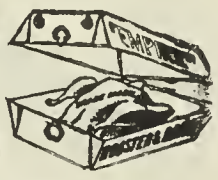
Lightning Dasher Egg Beater Co.,
Toledo, Ohio.

NEW YORK ELBOW CO.,

18 Cliff St., N. Y. City.



Makers of
Elbows
AND
Roasters.



THE TRIUMPH COOKER,
WITH LOCK COVER.
STEAMLESS, ODORLESS AND NON BOIL-OVER.
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.
A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.
THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN.



MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE CONNECTICUT PLATING CO.,

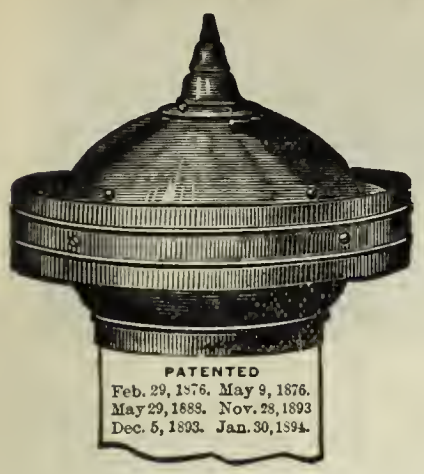
No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work.
Estimates cheerfully submitted.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers original patterns

MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH

WHEN HE SAYS THAT THE

RUTLAND LINING

FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE. N. J.

"FIRESTONE"

Has proved I self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

SELF LUBRICATING



Rotary Screw Ventilators

WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

46 Cortlandt St., New York

☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

315 North 2d St., - - - Philadelphia.

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works.

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.

Established 1866.

EDWARD L. CALELY,

STOVE PATTERNS

TO ORDER.

945 Ridge Ave., PHILADELPHIA, PA.

CENTRAL PATTERN WORKS,

Stove and Furnace Patterns a specialty. Work first-class under a full guarantee.

E. C. HALTEMAN, Proprietor, Dayton, O

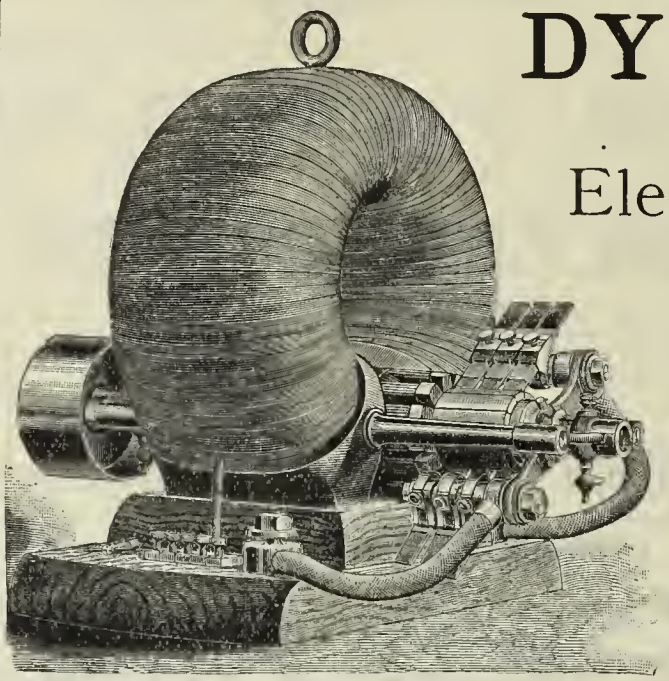
NICKEL PLATING OUTFITS.

ZUCKER & LEVETT & LOEB CO.
8 TO 14 GRAND STREET,
NEW YORK, U. S. A

SEND FOR CATALOGUE OF
NICKEL & ELECTRO-PLATING SUPPLIES & POLISHING MATERIALS.



AGENTS LADIES OR GENTS **$75 A WEEK,** At home, using or selling **Gray Platers,** or collecting goods for us to plate. We do all kinds of plating at our works, manufacture the materials and outfits, and **teach the art.** We sell the only complete outfit, including lathe, wheels, tools and materials for polishing, preparing, plating and finishing everything. Circulars and prices free. **Gray & Co., Plating Works, Dep't 4, Columbus, Ohio.**



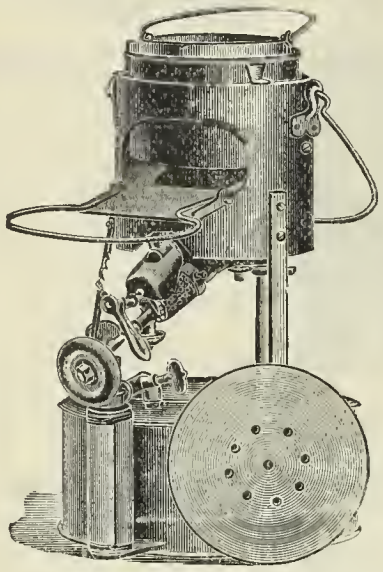
DYNAMOS
—FOR—
Electro-Plating,

NET PRICES:

No. 0,	200	Gallons, Nickel,	$100
No. 1,	600	" "	200
No. 2,	2000	" "	400

—THE—
Eddy Electric Mfg. Co.,
Windsor, Conn.

No. 2 BONANZA Combination Furnace.



For Plumbers and Tinners.

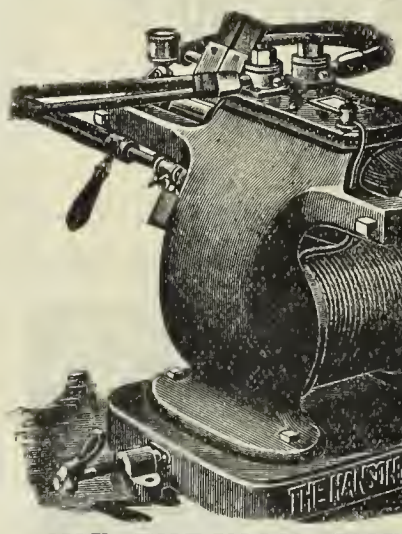
Price $6.50 combination, including Lead Pot and casing. Price $6.00 for Plumbers alone. Galvanized iron tank with brass top; my patented rubbe rpump handle; a double burner, burns inward from both sides; hottest fire ever produced from gasoline; melts 10 pounds of lead in five minutes; heats 5-pound coppers in three minutes; cannot blow out. One dollar off cash with the order. Look out for "ad." of Bonanza No. 1 and No. 3. Write for catalogue.

M. L. HULL, Cleveland, O.

ESTABLISHED 1820. INCORPORATED 1891.

The Hanson & Van Winkle Co.,

MANUFACTURERS OF



NICKEL AND ELECTRO PLATERS' MATERIAL.

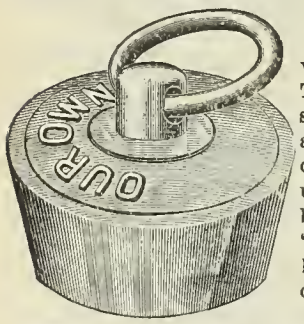
Nickel-Plating Outfits
From $20 upward.
DYNAMO-ELECTRO MACHINES
For all purposes.
The New H. & V. W. Dynamo Machine.
In sizes from No. 1 to No. 5.
FROM $100 TO $800.

These machines will be placed on 30 days' trial with responsible parties, and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.

219-221 Market St., Newark, N. J.
81 Liberty St., New York.
35-37 South Canal St., Chicago, Ill.

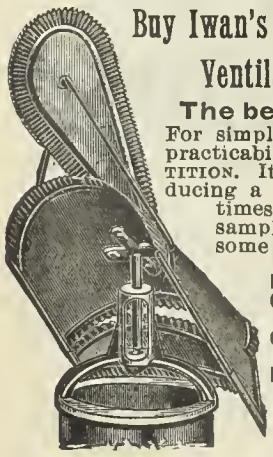
WE FURNISH EVERYTHING.

BASIN AND BATH TUB PLUG.



White Rubber with Heavy Nickel Trimmings. Absolutely the neatest and strongest plug on the market. Put up one dozen in a box, and labeled "OUR OWN" BASIN PLUG only.

H. O. CANFIELD,
—MANUFACTURER OF—
MOULDED RUBBER GOODS,
BRIDGEPORT, CONN.



Buy Iwan's Volcano Revolving Ventilating Chimney Top

The best in the World

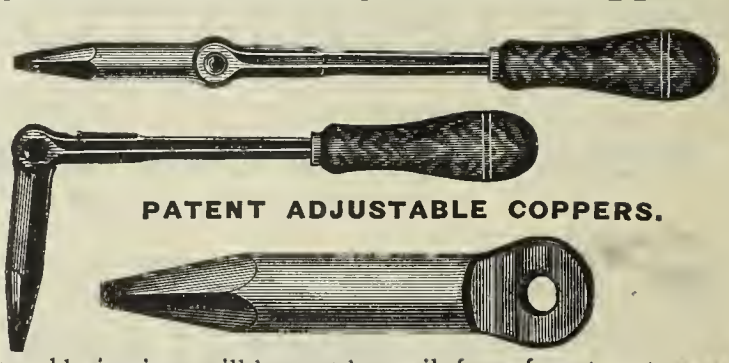
For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.

FOR SALE BY
Berger Bros., Phila., Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Cincinnati Stamping Co., Cincinnati, O.
Illinois Roofing & Supply Co., Chicago, Ills.

IWAN BROS.
Sole Mfrs., Streator, Ills.

Covert Pat. Adjustable Soldering Irons and Coppers

It is a complete tool in every respect, and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.



PATENT ADJUSTABLE COPPERS.

☞A sample of ⅞ in. soldering iron will be sent by mail, free of postage to any address, on receipt of sixty cents (60c.).

FOR SALE BY ALL GENERAL HARDWARE AND PLUMBERS' SUPPLY HOUSES.

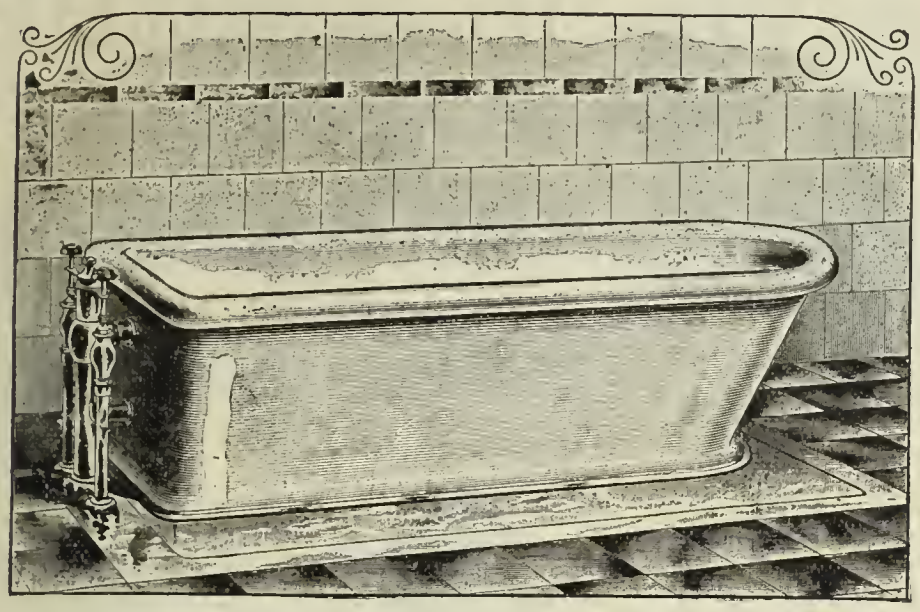
COVERT MFG. CO., - West Troy N. Y.

DO YOU WANT A PERFECT BATH TUB?

THEN USE

"THE PURITAN ROLLED RIM."

PATENTED.



Since the introduction of Iron Bath Tubs there have been objections made to their height, they being very inconvenient to get in or out of; also, difficult to clean beneath them. We have overcome both these objections in the "Puritan" Bath.

In the first place, while retaining the full size inside, it is 8½ inches less in height from the floor to the top of the rim, thus making it very much easier of access.

In the second place, by using the floor flange we dispense with the objectionable feet and floor space underneath, and also give the bath a better means of support than can be obtained by feet, and presenting as it does a plain, smooth surface both inside and out, it can easily be kept clean, and when in position it has a neater and more substantial appearance than a bath on feet.

☛ THE BATH SETS INTO THE FLOOR ABOUT 2½ INCHES. We have these Baths fitted with a variety of Fixtures. Send for circulars.

DALTON-INGERSOLL COMPANY,

169 to 175 High Street (Fort Hill Square), Boston, Mass.

CHICAGO BRANCH: 65 Washington St., Institute of Building Arts.

NEW YORK AGENCY: C. Hoffman, Jr., 277 Pearl St.

THE KELLY

Self-Acting Frost-Proof, After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

—SEND FOR CATALOGUE.—

Thomas Kelly & Bro.,

124 Franklin St., Chicago,

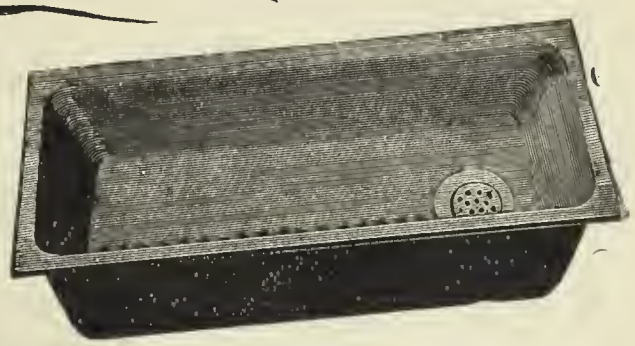
Manufacturers of Permanent Plumbing Goods.

Columbus

WROUGHT STEEL SINKS

ARE DRAWN FROM A SINGLE SHEET OF STEEL, AND ARE SUPERIOR TO CAST IRON SINKS IN EVERY PARTICULAR; BEING LIGHTER, STRONGER AND MORE DURABLE. WILL NOT BREAK FROM HEAT, COLD OR ANY CAUSE WHATEVER. BEING LESS POROUS THAN CAST SINKS, ARE COMPARATIVELY ODORLESS, AND THEIR GREAT ELASTICITY AVOIDS THE BREAKAGE OF DISHES.

THE BOTTOM IS FORMED TAPERING TO THE CENTER AND THE OUTLET, SO THAT THE DRAINAGE IS PERFECT, AND ENABLING THE ATTACHMENT OF STRAINER AND PIPE MORE SATISFACTORILY THAN IS POSSIBLE WITH ANY OTHER MAKES.



We Are The Originators

Of the Wrought Steel Sink, and are in position to supply them in any style finish desired, and in many different shapes, at prices that will be named.

THE

Kilbourne & Jacobs Man'fg Co.,

Columbus, Ohio, U. S. A.

Look Here, Tinners, Roofers & Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

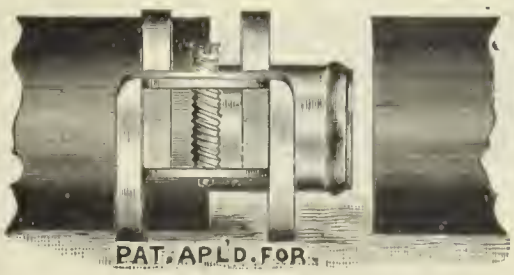
They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.

Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screwdriver being all the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust. Sold by Jobbers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.



BROUGHTON'S

PATENT

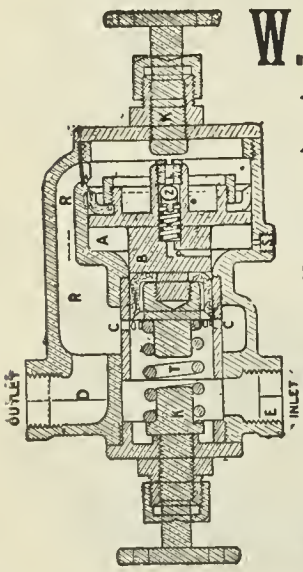
SELF CLOSING

BASIN COCK

EVERY ONE WARRANTED

Send for Circulars.

Stebbins Manufacturing Co., Brightwood, Mass.
SOLE MANUFACTURERS.



W. G. Taafel's Pressure Regulator.

Send for Price-List

NEWARK REGULATOR COMPANY

Newark, Ohio.

DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.



The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discounts

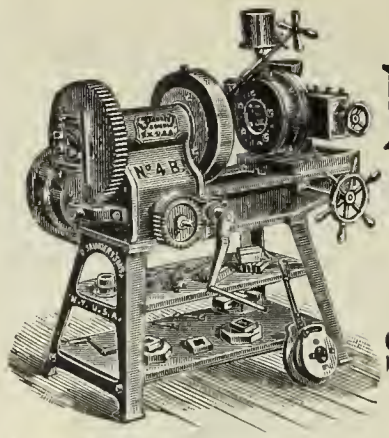
MADE BY

THE DAY MFG. CO.

Detroit, Mich., U. S. A.

This pig went to market,
This one refused to roam;
But the one that takes two seats in a car
We wish would stay at home.
—*Chicago Inter Ocean.*

D. SAUNDERS' SONS,



MANUFACTURERS OF

PIPE Cutting AND Threading MACHINES

All sizes ¼ inch to 16 inch for Pipe Mill, Gas and Steam Fitters' use. Tapping Machines for steam-fittings, also

STEAM and GAS FITTERS' HAND TOOLS.

SEND FOR CATALOGUE.

No. 4 B Machine, ⅛ to 4 inch. Hand or Power.

No. 25 Atherton St., Yonkers, N. Y.

ZERO VALVE CO.,

212 Seneca St.,
Buffalo, N. Y.

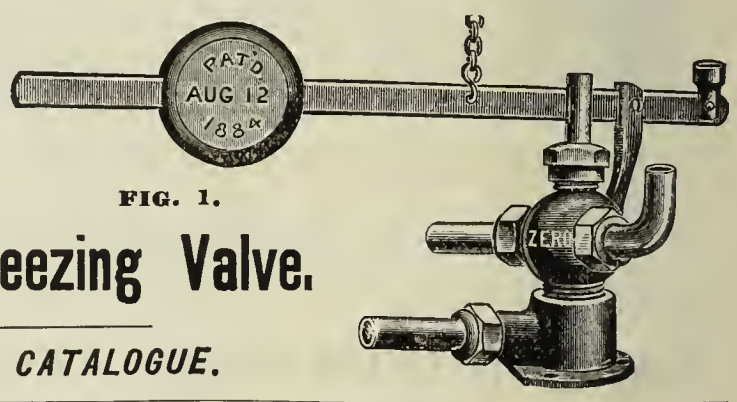


FIG. 1.

Zero Anti-Freezing Valve.

SEND FOR CATALOGUE.

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

INEXPENSIVE.

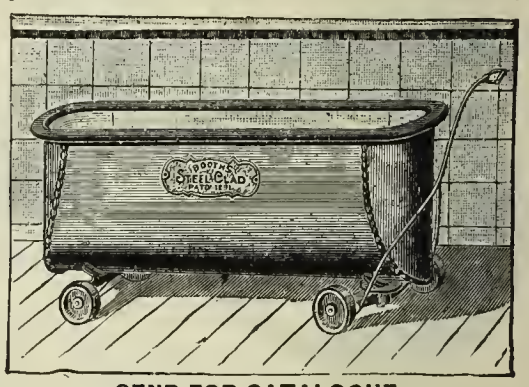
It is light, durable, cleanly, low in price, never rusts out, cannot break. Can be decorated to suit individual taste. A boon to country householders, who by its use can enjoy a comfortable bath without expensive piping or the labor of carrying water.

There are many styles and sizes of the **Steel Clad Bath,** but only one quality. Don't buy an imitation. Get the **Steel Clad.** All plumbers and jobbers have it, or the

STEEL CLAD BATH CO. OF NEW YORK,
447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

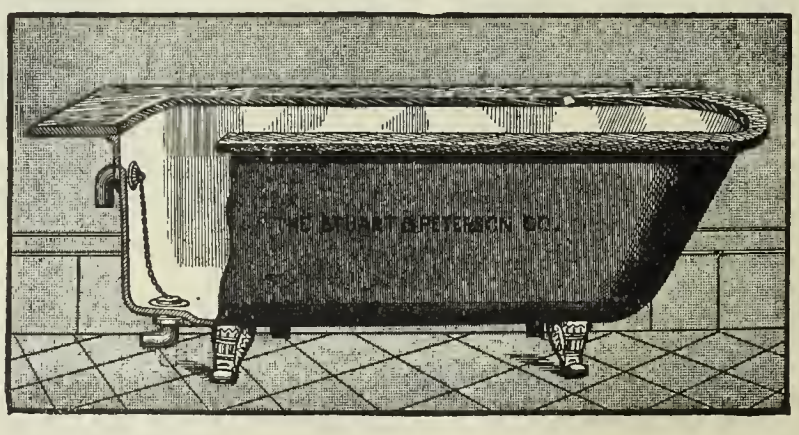
STEEL BATH MFG. CO.,
Detroit, Mich.
GEORGE BOOTH, President.

FOR HOSPITALS AND THE SICK ROOM.



SEND FOR CATALOGUE.

WELL!! WELL!! WELL!!



PORCELAIN LINED BATHTUBS,

WITH Overflow Strainers and Plugs Complete

$28.00

WRITE US.

The Stuart & Peterson Co.,
Burlington, N. J., U. S. A.

Porcelain Lining to order.
Special Goods to Order

Gray Iron Castings,

Cheap Heating Stoves,
Diamond Thimbles.

S. CHENEY & SON,

MANLIUS, N. Y.

Leather and Rubber WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

COLWELL LEAD COMPANY,

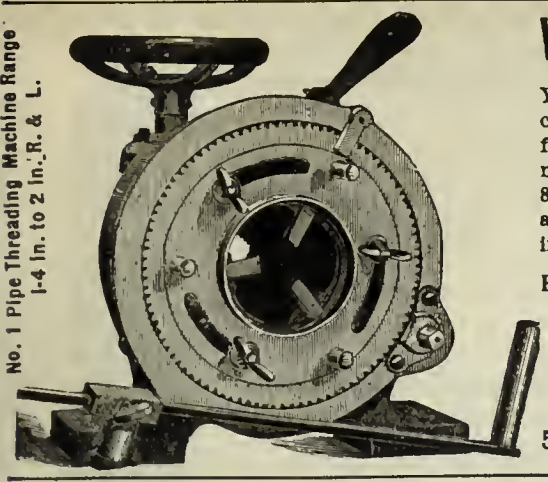
Centre Street, and 681 Sixth Avenue, Cor. 39th Street, NEW YORK.

LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order.



When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for **cutting and threading pipe.** Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.

W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON,

156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.



This Cut is 2-3 the Size of Faucet.

CLARK'S NEW FAUCET

—FOR—

MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.

MYERS'

REVERSIBLE STEEL AND WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS



Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE,** will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.

GREATEST IMPROVEMENT OF THE AGE.



GUM A RUBBER,

Or

RUBBER GUM,

Or

Elastic Cement.

No matter what you call it,

IT'S A DANDY.

Just what you want to make a pipe joint tight. It discounts

WAX, RED LEAD, BLACK LEAD.

Holds the mercury sky high on a test job.

BAILEY-FARRELL MFG. CO.,

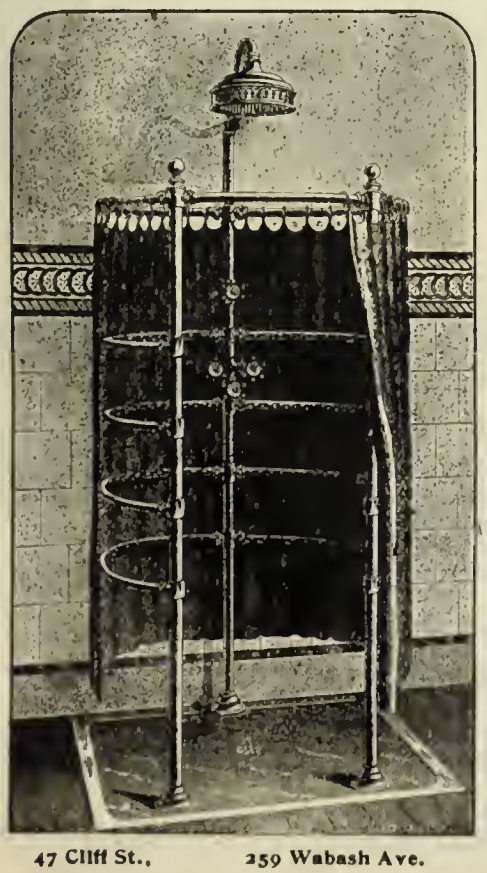
PITTSBURGH.



The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating burners.** It is a modern, perfected apparatus warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adjustable burners. Send for catalogue.

C. M. KEMP MFG., CO.,

BALTIMORE.



47 Cliff St., NEW YORK. 259 Wabash Ave. CHICAGO.

Peck Bros. & Co.,

MAKERS OF

Fine Sanitary Brass Work and Sanitary Fixtures of only Highest Grade.

HAVE YOU OUR CATALOGUE.

This reduced cut, Fig. 218, is only one of hundreds of others

127 Chestnut St., NEW HAVEN, CT. 65 Oliver St., BOSTON.



OUR ADJUSTABLE STOCKS and DIES are universally acknowledged to be the **BEST!** We also make all our Tools on the same principle, of the **Best Material** and **Workmanship,** and always with a view of *time and labor saving in their use.*



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

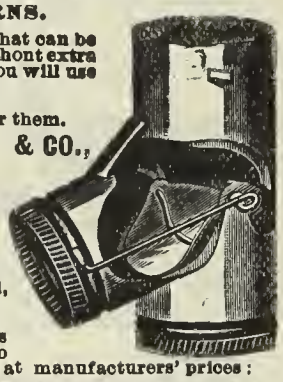
CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.





THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

3-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.

EAVES TROUGH HANGERS.

PROUDMAN BROS.,

MERIDEN, CONN.



TINNERS, ATTENTION! GREAT REDUCTION IN PRICE.

Best Eave Trough Fastener in the World.

Yapp Patent Champion Fastener

MANUFACTURED BY

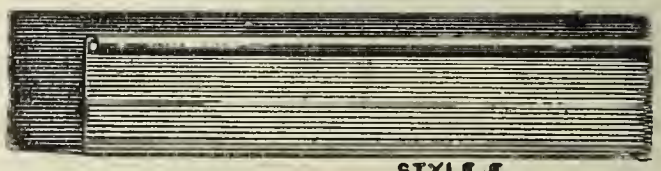
WALTHER & CHRISTMAN,

Successors to CHAS. BODY,

269 to 275 Central Ave., Cleveland, Ohio

Send for sample and price-list





STYLE F.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

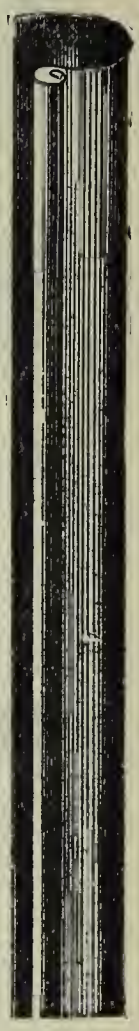
PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

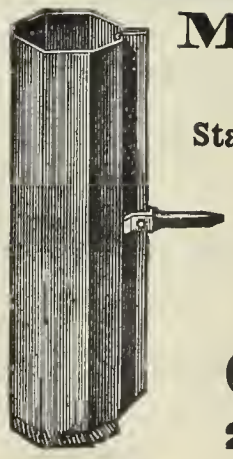
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,



(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

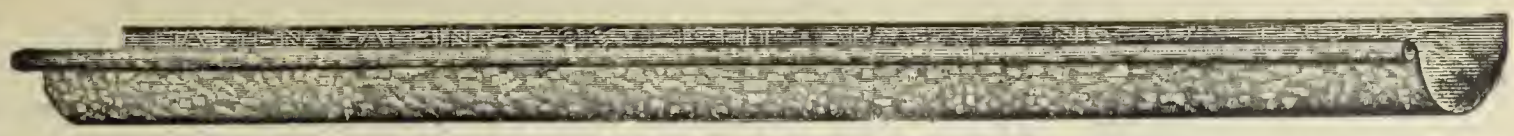
With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

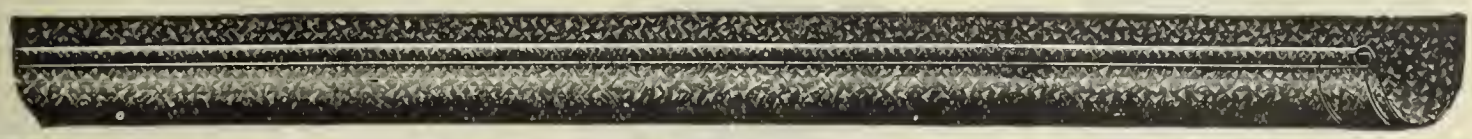
GALVANIZED IRON CORNICES.

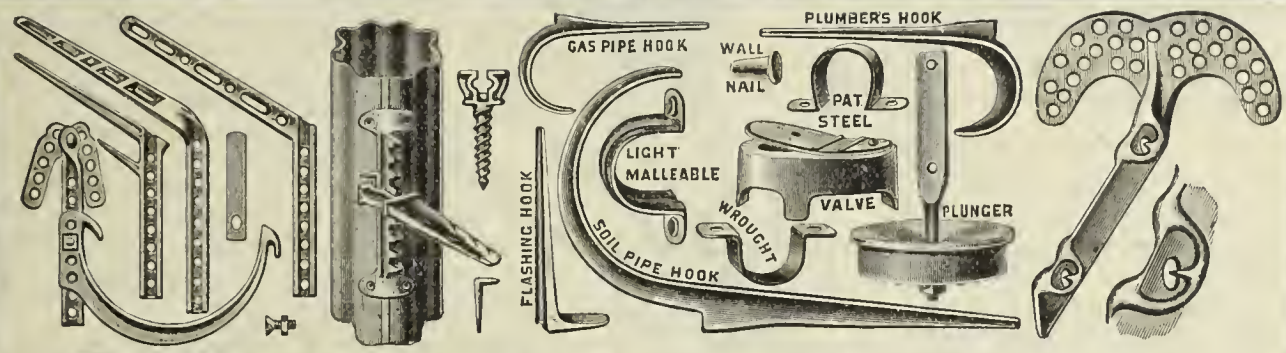
206 Robinson St., ALLEGHENY, PA.



BOWERS ROOFING AND METAL WORKS.

Eaves-Troughs, Gutters, Miters, Trough-Ends, Conductors, Ridging. **BINGHAMTON, N. Y.**





Berger Bros.,

TINNERS' HARDWARE, ROOFERS' SUPPLIES.

231 and 237 Arch St., Philadelphia.

GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,

. . . . Largest Stock, Greatest Variety, Prompt Shipments.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Hods, Elbows, Ears, Handles, Valves and Plungers, Etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.

Eave Trough.



Conductor Pipe.



EAVE TROUGH, CONDUCTOR PIPE, &c.

DO YOU WANT the very best? If so address the manufacturers and receive their prices. They can save you money, as well as furnish you with superior goods, made on greatly improved machinery.

THE KANNEBERG ROOFING CO.,

CANTON, OHIO.

MAPLE SYRUP CAN and SAP BUCKET STOCK.

We are now prepared to quote and ship promptly. Get our prices before buying.

J. M. & L. A. OSBORN, - - - CLEVELAND, O.

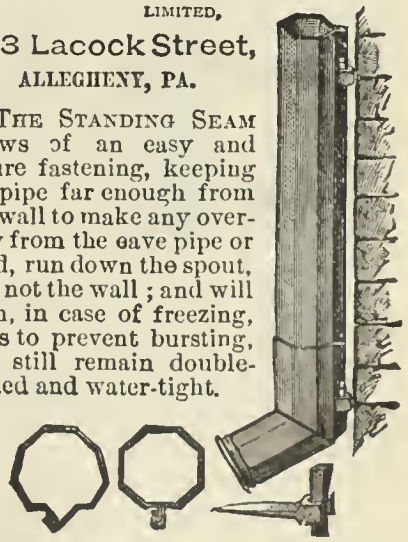
THE IRWIN & REBER PATENT

EXPANDING WATER CONDUCTOR.

MANUFACTURED BY THE

S. S. S. Conductor Co. LIMITED,

163 Lacock Street, ALLEGHENY, PA.

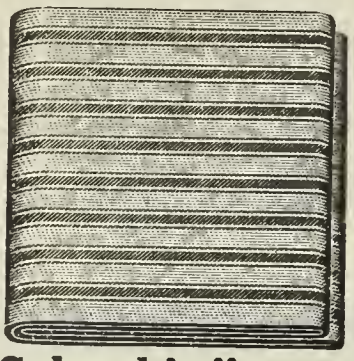


THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.



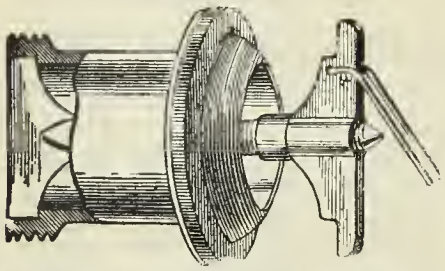
"Columbia" Wiping Cloths FREE!

Not free exactly from a financial standpoint (altho' very near it), but free from all defects due to **a Poor Quality of Ticking, Carelessness in Making and a Bungling Manner of Fastening the Ends.** A cloth free from the above defects is well worth the price we ask, 12 cents each, or six for 70 cents. Remember we make any kind—send us the size you want, giving the wiping edge first.

THE J. W. CHAMBERLAIN CO.,
Plumbing & Steam Fitting Specialties,
BANGOR, MAINE.

CLOSET REPAIR COUPLING.

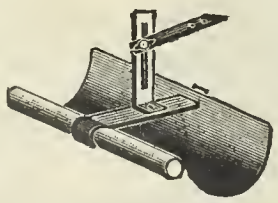
(Patent applied for.)



MADE in two styles, to suit iron and lead pipe.
TAKES the place of the old spud and necessitates no change in fixtures.

MANUFACTURED ONLY BY
SAVILL, WALLS & CO.,
Mfrs. of Plumbers' Supplies,
229 Budden Street - - - PHILADELPHIA.

RICHMOND — E. T. HANGER. PATENTED.



TINNER, ATTENTION!

The cross-bar is hooked firmly to both sides of the trough. The slotted upright, with thumb-screw, permits instant adjustment to the requisite fall. It is never necessary to bend the suspending rod to suit pitch of roof. No obstructions to catch leaves and dirt, as in other adjustable hangers. **Save Time and Money.** Sample order freight allowed. For sale by first-class Jobbers. Manufactured by

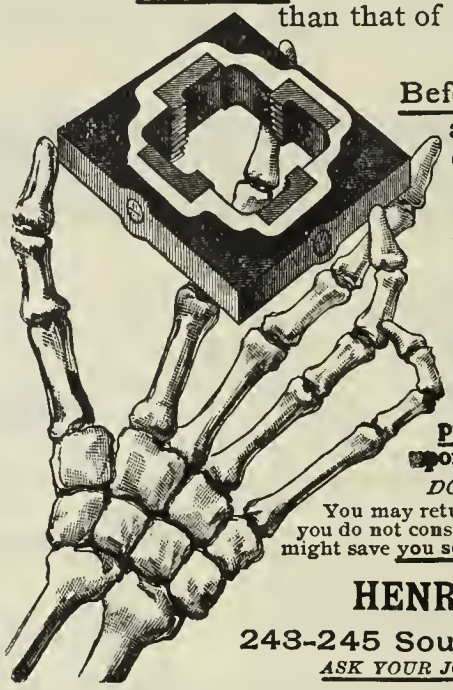
JOHN SEVERDING, - - Richmond, Ind.

Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

1

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

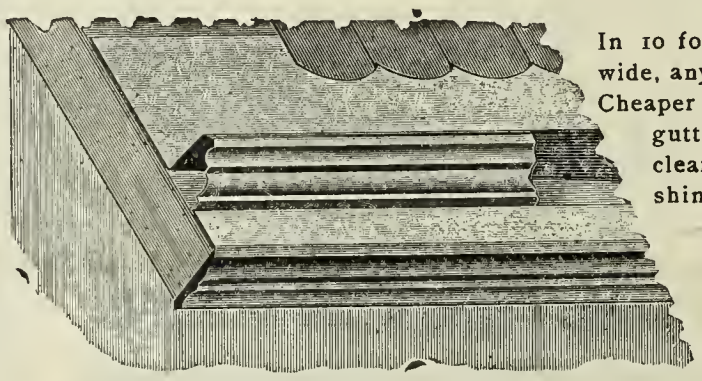
A sample One-inch "Skeleton" Pipe Die, either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you 62 cents, and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

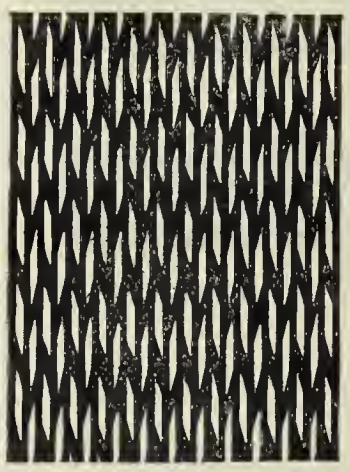
HENRY B. PANCOAST & CO.,
243-245 South 3d Street, Philadelphia, U, S. A.
ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.

Sims' Ornamental Roof Gutter.



In 10 foot lengths, 12 in. to 30 in. wide, any fall desired, will not leak. Cheaper than wood or any other gutter. One continuous piece, clear up under slate or tin or shingle. Write for prices.

The
Sims Mfg. Co.,
Newark, O.



SHEET METAL LATH.

Improved METALLIC LATHING is now being used in construction of all modern buildings, being FIRE-PROOF, RIGID, with ample keying qualities, and is easily applied, and embraces a material saving in plaster if necessary.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted and Corrugated Leader, cheapest and best in the market. Sheet iron piping, Stove Pipe and Fittings of every description.

General Galvanizing to Order.

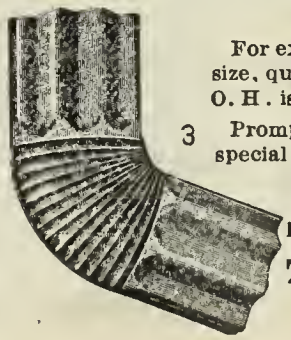
The Jersey City Galvanizing Co., Manufacturers and Jobbers in *Galvanized Material of Every Description.*

Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE OF OUR SPECIALTIES.

The "O.H." One Piece PLAIN ROUND and CORRUGATED CONDUCTOR AND STOVE PIPE ELBOWS.

(PATENTED OCT. 25, 1892.)



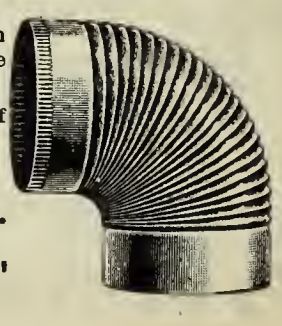
For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.

For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,
WAVERLY, N. Y.



Gummey's Anti Pin Hole Bright Tin Plate.

By permission of Messrs. Fieber & Holmes, Brookville, Indiana, we insert the following testimonial:

BROOKVILLE, IND., FEB. 1, 1895.

Messrs. GUMMEY, SPERING & Co.,
Philadelphia.

GENTLEMEN:

We have some Coffee Pots and Boilers made from your Anti Pin Hole Tin which have been in use over a year and only one of them ever came back for repairs. In this one case it had a flat copper bottom, and the *bottom* was worn out. We carefully examined the tin on the inside and could not see that it was eaten a particle This Boiler was a very large one for the County Poor Asylum.

Yours truly,

(Signed) FIEBER & HOLMES.

ÆTNA-STANDARD IRON & STEEL CO.

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. **BRIDGEPORT, OHIO.**

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD

Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,
535 to 547 West 15th Street, New York.

NEW CASTLE

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

New Castle Steel and Tin Plate Co., New Castle, Pa.

THE PHILLIPS TIN PLATE CO., Philadelphia, Pa.

"F. R. P. EXTRA." Treble coated. Oil Finish. Guaranteed to carry 45 lb. coating.
"PHILLIPS ROOFING." Extra heavy. Bright finish. " " 35 lb. "
"BOSTON." Heavy Spangled Terne. Guaranteed to carry 20 lb. coating.
"NATIONAL." (Worcester grade.) " " 10 lb. "

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

FOLLANSBEE BROTHERS COMPANY,

Successors to

James B. Scott & Co,

Manufacturers of the well and favorably known "**Scott's Extra Coated**" guaranteed Roofing Tin. **Trade-Mark Registered.**

The officers of this Company are the surviving members of the old firm, and the management, manufacture and inspection of each plate are in charge of the same individuals as heretofore.

Also sole factors

Blairsville Rolling Mill and Tin Plate Co.,

Manufacturers

Black Plate, Tin Plate, Terne Plate

Offices and Warehouses, 122 and 124 Second Ave.,

PITTSBURGH, PA.

BEWARE OF IMITATIONS.

"BREVITY" MAY BE "THE SOUL OF WIT"—

But short pieces of tin do not make "TANDEM" CONTINUOUS ROOFING....

CUSTOMERS are told what to expect—and get it. In "TANDEM" they get a roll of good, prime tin, made of sheets 96 in. long, furnished either 14 in., 20 in. or 28 in. wide; and, if desired, THOROUGHLY WELL PAINTED.....

"TANDEM" is put on the market under no false pretenses. It is not a light weight tin; it is not made from 14 x 20 in. or 20 x 28 in. sheets—and IS NOT SOLDERED BY HAND.....

"TANDEM" Continuous Roofing Tin is made in IC and IX thicknesses. Primes and Wasters are sold separately. Before buying continuous roofing tin, be sure of what is being offered you in competition with "TANDEM".....

MERCHANT & CO., Inc.,

PHILADELPHIA, NEW YORK, CHICAGO, BROOKLYN, LONDON.

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

TRADE-MARK AMERICAN RGV CLEANED.

THE CAMBRIDGE IRON & STEEL CO.

MANUFACTURERS OF

GALVANIZED CAMBRIDGE C I&S CO BEST TRADE MARK SHEET IRON

BLACK SHEETS FOR ROOFING & CORRUGATING

PICKLED & COLD ROLLED FOR STAMPING

CAPACITY RANGES FROM No 30 26 INCHES WIDE TO 1·4×40·120

CORRESPONDENCE SOLICITED

OFFICE & WORKS CAMBRIDGE, OHIO.

ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS.** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

Standard Books
—ON—
FOUNDRY PRACTICE

The Encyclopedia of Founding and Dictionary of Foundry Terms,

used in the practice of molding. Together with a description of the tools, mechanical appliances, materials, and methods employed to produce castings in all the useful metals and their alloys, including brass, bronze, steel, bell, iron and type founding, with many original mixtures of recognized value in the mechanic arts. Also aluminum, plating, gilding, silvering, dipping, lacquering, staining, bronzing, tinning, galvanizing, britannia-ware, German silver, nickel, soldering, brazing, ores, smelting, refining, assaying, etc. By SIMPSON BOLLAND, Author of "The Iron Founder," "The Iron Founder" Supplement. 12mo.: cloth.....$3.00

The Pattern Maker's Assistant

Embracing lathe work, branch work, core work, sweep work and practical gear constructions, the preparation and use of tools, together with a large collection of useful and valuable tables. Sixth edition. By JOSHUA ROSE, M. E.; illustrated with 250 engravings; 324 pages: cloth.....$2.50

Modern Molding and Pattern Making.

A practical treatise upon pattern shop and foundry work. By JOSEPH P. MULLIN, M.E.: 257 pages; cloth; illustrated. $2.50

Iron and Steel Founding.

Illustrated with 39 diagrams. By C. WYLIE. Second edition, revised and enlarged; 324 pages; 8vo; cloth... .....$2

The Practical Brass and Iron Founder's Guide.

A treatise on brass founding, molding, the metals and their alloys, etc. By JAMES LARKIN, late conductor of the brass foundry department in the Penn Works, Philadelphia. A new revised and greatly enlarged edition. Contents: Among the most important and entirely new sections of this edition of this valuable and popular book are the following: Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to Other Metals; Casting Iron and Other Metals Upon Lace, Embroideries, Fern Leaves and Other Combustible Materials; Some Modern Bronzes. In one volume; 12mo; 400 pages.....$2.50

American Foundry Practice.

Treating of loam, dry sand and green sand molding, and containing a practical treatise upon the management of cupolas and the melting of iron. By THOMAS D. WEST, practical iron molder and foundry foreman. Fully illustrated. Eighth edition, revised. 408 pages; cloth.....$2 50

The Iron Founder.

A comprehensive treatise on the art of molding, including chapters on core-making, loam, dry sand and green sand molding, also crystallization, shrinkage and contraction of cast iron and a full explanation of the science of pressures in molds, added to which are formulas for mixtures of iron, tables, rules and miscellaneous information. By SIMPSON BOLLAND. Illustrated with over 300 engravings. 12mo, cloth....$2.50

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings, wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. Illustrated with over 200 engravings; 400 pages; 12mo: cloth..... ...$2.50

Sent, Postpaid, on receipt of price, by

DAVID WILLIAMS,

Bookseller and Publisher,

96-102 Reade St., New York.

Bright Charcoal Tin Plates.
Coke Tin Plates.
A Full Assortment of Sizes.

ALSO

20 x 28 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.	
IC	CLYRO—Old Way, Stamped and Squared.	
IC	M F Stamped and Squared.	
IC	PONTYMISTER—Old Style, Stamped and Squared.	
IC	KILLEY—Extra Coated, Stamped and Squared.	
IC	L P L—Extra Coated, Stamped and Squared.	
IC	LILY—Stamped and Squared.	
IC	DYFFRYN,	200 lbs. PETREL.
IC	WORCESTER.	IC ALYN.
200 lbs.	WORCESTER.	IC BAAN.
IC	W T R—Stamped.	IC MANSEL.
200 lbs.	W T R.	IC ALBAN.
IC	P T L.	200 lbs. ALBAN.
IC	DEAN	190 lbs. ALBAN.
200 lbs.	DEAN.	200 lbs. CAWDOR.
IC	PETREL.	190 lbs. CAWDOR.

14 x 20 ROOFING.

IC	TREGONING—Old Process, Treble Coated, Stamped and Squared.
IC	CLYRO—Old Way, Stamped and Squared.
IC	M F—Stamped and Squared.
IC	PONTYMISTER—Old Style, Stamped and Squared.
IC	KILLEY—Extra Coated, Stamped and Squared.
IC	L P L—Extra Coated, Stamped and Squared.
IC	W T R—Stamped.
100 lbs.	W T R.
IC	P T L.
IC	DEAN.
100 lbs.	DEAN.
IC	PETREL.
100 lbs.	PETREL.
100 lbs.	CAWDOR.
IC	BAAN.

WASTER ROOFING.

ICW	20x28	GWERNEN.
ICW	"	W T R.
200 lbs. W	"	ALBAN.
190 lbs. W	"	ALBAN.
180 lbs. W	"	DYFFRYN.

SOLDER—The reduction in Pig Tin has made prices much lower.
RUSSIA SHEET IRON (Genuine)—The duty has been reduced, and prices are lower than last year. No. 8 to No. 16 inclusive, sheets 28x56 inches.

BRUCE & COOK,
190 Water St., New York.

McDaniel & Harvey Co.,
SHEET IRON MANUFACTURERS,
SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ILLINOIS ZINC COMPANY.
MANUFACTURERS OF
SPELTER AND SHEET ZINC
PERU, ILLINOIS.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. Brooklyn, N. Y.

BLACK DIAMOND

EXTRA TRADE MARK COATED

ROOFING PLATES

are thoroughly AMERICAN

in every respect. One trial will convince you of their superiority over anything you have ever used. Send for sample and thoroughly test it. Manufactured by HENRY W. SCATTERGOOD.

Black Diamond Tin Plate Works, 51 & 53 Laurel St., Phila.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty*

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

Buy Plain and Corrugated Conductors and Single and Double Beaded Eave Troughs, all in 10 ft. lengths; also Brick Siding, Corrugated Roofing, Cornices, &c., of

ALLEN'S CORRUGATING WORKS,

422 and 424 W. Randolph St., CHICAGO, ILL.

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96 102 Reade St., New York.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.

AMERICAN ROOFING CO.,

ST. LOUIS and CINCINNATI.

Mention this paper.





— "I was on a train, and near me sat an elderly woman, evidently from the remoter section of the country, with whom I got into conversation. She was ignorant, but of considerable native ability, and decidedly sharp of speech. She felt a strong aversion to politics and politicians, and was so vigorous in her attacks that I was forced to come to the rescue.

"'My dear madam,' I said in protest, 'I'm a politician.'

"'No, you don't say!' she exclaimed, looking at me with curiosity.

"'Yes, I do say it, and, what is more, I am a Member of Congress.'

"She actually threw up her hands in astonishment at this statement.

"'Well,' she said, 'I never would have thought it. And do you get paid for doing it?'

"'I certainly do. The salary is $5000 a year.'

"'Do tell," she exclaimed, 'Well, some men will do anything for money.'"—*Detroit Free Press*

— NOT BOSTONIAN.—Mrs. Parvenoo: "What are you going to leave us for, Priscilla? Aren't you satisfied with your job?"

Priscilla (the domestic from Boston): "It is not of my duties I complain, for they are not onerous. But your language is so full of solecisms and barbarisms that my nerves are completely unstrung."—*Philadelphia Record.*

For

SHEET METAL SKYLIGHTS,

Get prices from

James A. Miller & Bro.,

129 and 131 South Clinton St., Chicago.

They think that for a good skylight they can make a little lower price than can any of their competitors.

Catalogues and prices on application.



No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size. CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices.

LITTLEFORD BROS., SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



HARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

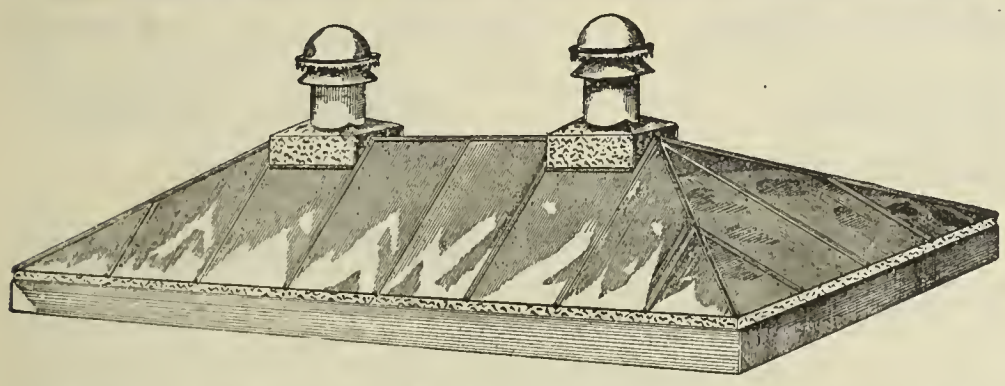
Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.





Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

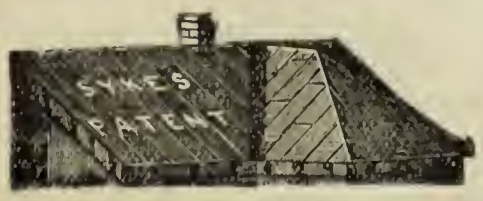
Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.



WORLD'S FAIR AWARD

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

MANUFACTURERS

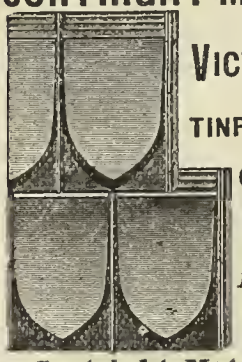


FOR

ROOFING AND SIDING.

Send for Circular and Prices.

CORTRIGHT METAL SLATES



and

VICTORIA SHINGLES

Made of

TINPLATE, (Full Weight Only)

Galvanized Steel

and

COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office. 134 Van Buren Street, Chicago.

Defy Fire and Time

WITH OUR

Steel Roofing,
Steel Ceilings, (Patented)
Corrugated Iron, Conductor Pipes,
Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,

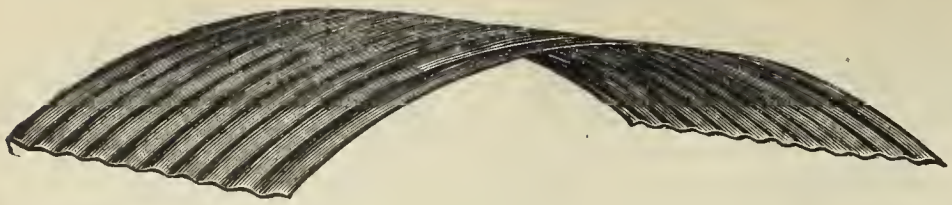
Office and Works, Wheeling, W. Va.
Office and Warehouse, 474 Laflin St., Chicago.
Office and Warehouse, 81 Fulton St., New York.



IRON ROOF CRESTING.

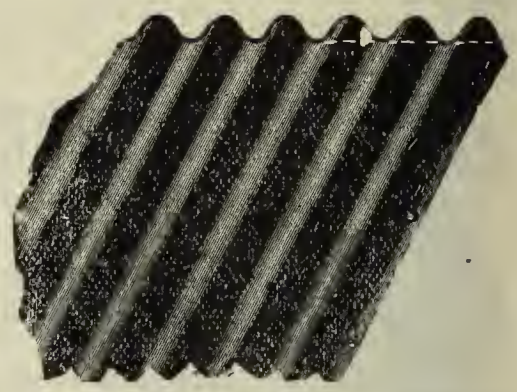
Full line of new and desirable designs.

S. GREEN & SONS, Des Moines, Ia.



Curved and Corrugated

Sheets for Structural Purposes



Any size and dimension, ready for placing in position without trimming. Lightness, strength and durability insured at a minimum cost.

Such as
Houses,
Barns,
Factories,
Warehouses,
Granaries,
Sheds, Etc.

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.

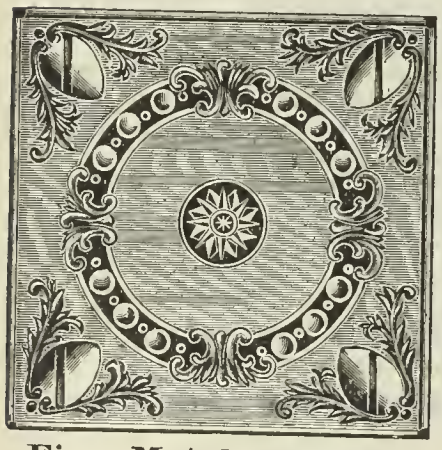
The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S.

FIRST & WASHINGTON STS. JERSEY CITY, N.J.

J. H. ELLER & CO.,

MANUFACTURERS OF



Fine Metal Ceilings.

Steel Roofing, Corrugated Iron Roofing and Siding,

Pressed Steel Brick and Rock Face Siding.

GALVANIZED CORNICE,
WINDOW CAPS,
CRESTINGS, FINIALS, ETC.

GALVANIZED STEEL EAVE TROUGH,
CORRUGATED EXPANDING CONDUCTOR,
STEEL EAVE TROUGH HANGERS, ETC.

Estimates Furnished for Special Designs on Short Notice.

WRITE FOR CATALOGUE AND PRICES.

Office 194 E. Fifth Street, - - - - - - - CANTON, OHIO.

— A WITTY PRIEST.—Father Healy, the celebrated parish priest of Killiney, was a true wit. Mr. Balfour, while he was Chief Secretary for Ireland, once asked Father Healy if the Irish hated him as heartily as the newspapers declared they did.

"If they only hated the devil half as much as they hate you," said the honest father, "there would be no work left for us to do!"

Once he sent a sort of Mr. Malaprop to England to buy a horse for him.

"I did not buy him," said the man, on his return, "because he had a touch of the vernacular."

"Then you should have bought him," said Father Healy, "for he must have been a lineal descendant of Balaam's ass!" *Youth's Companion.*

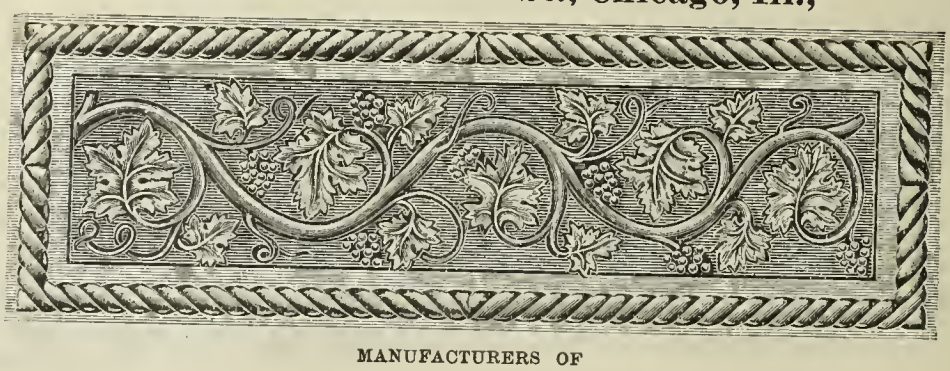
— A DOG OF THE FOUR HUNDRED.—"Did you see the blind German and the dude dog?"

"Yes; but why do you call him a dude dog?"

"'Cause he leads the German. See?"

Friedley & Voshardt,

194 and 196 Mather St., Chicago, Ill.,



MANUFACTURERS OF

Sheet Metal, Zinc and Copper Ornaments

For Interior and Exterior Work, Steel Ceilings, Statuary, &c.

Send for Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.

Architectural
Sheet Metal
Work.

Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

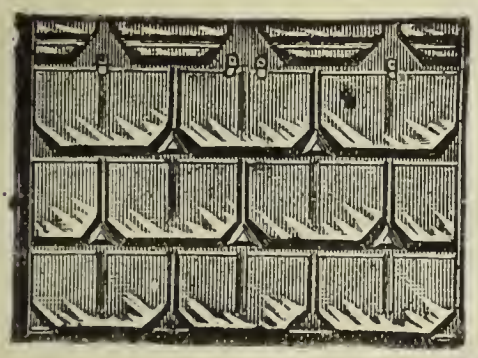
Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.

THE FAVORITE METAL SHINGLE

EASTLAKE



MONTROSS PATENT.

Gothic and Diamond Tile.

Unequaled for beauty and excellence.

SEND FOR CIRCULAR.

W. J. Burton & Co., - - - - Detroit, Mich.
Montross Metal Shingle Co., - - Camden, N. J.
E. Van Noorden & Co., - - - Boston, Mass.

BEWARE! OF INFRINGMENTS.

CLUSTER STEEL SHINGLES. ROLL STEEL ROOFING.

..Purchase only the..

Genuine Pressed Steel Brick



PATENTED APRIL 5th 1887

Corrugated Steel CEILINGS

THE PENN IRON ROOFING AND CORRUGATING Co LIMITED

For Catalogue, Samples and Prices. 23rd & HAMILTON Sts PHIL'A. PA. U.S.A

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

—MANUFACTURERS OF—

SHEET METAL ROOFING, SIDING AND CEILING

—OF ALL DESCRIPTIONS FROM—

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.

Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.
Factory 113 to 133 Soulard Street, ST. LOUIS, MO.

When Painting Roofs,
When Painting Stacks or Boiler Fronts,

use Dixon's Silica-Graphite Paint and you will never regret it. Roofs well painted have not required repainting in 10 to 15 years. Graphite paint is equally useful for wood or metal. Send for circulars.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

THE ROOT & BARRON

ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer,
PALMYRA, NEW YORK.

SALEM NAIL CO.

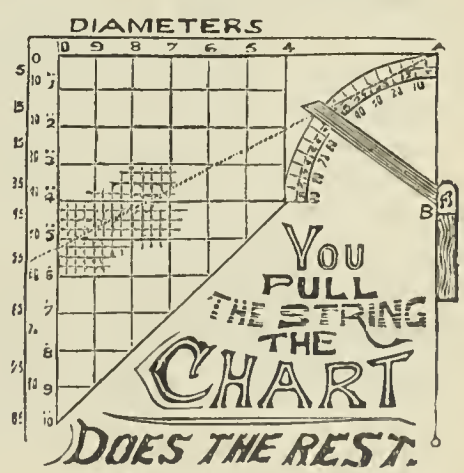
O. Nelson, 292 Pearl St., New York

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds.



ELBOW PATTERN CHARTS.

Quick method. Easy to learn. Good to have. Over 1000 sold. 50c. by mail.

A. L. BURTIS, Lockport, N. Y.

JOHN SANBORN,
Dealer in Metals,
and manufacturer of Refined Metal Solder, Wire Solder, Plano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 WATER STREET,
Near Beekman Street, NEW YORK.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade.
TIN AND IRON SHOW CARDS.
110 John St., - New York.

Show Windows Abroad.

"Europeans don't go in for newspaper advertising to anything like the extent that we do here," said an American recently returned from abroad to a New York *Sun* reporter, "but they take the shine right off Americans for original schemes to attract attention to their shop windows. In London, Paris and the larger cities of Belgium the shopkeepers are continually devising catchy advertisements. Shoe dealers, hatters, safemakers and men in the various mercantile lines do the business up best, but the confectioners, pastry men and other small merchants are not a long way behind them. A shoe dealer in Brussels, who makes a specialty of a waterproof shoe, keeps a pair of shoes standing in a pan of water in his window all day long. The water comes just up to the tops of the soles, and the public are respectfully invited at all times to step up and feel the inside of the shoes and see that they are perfectly dry. Another shoe dealer in London made a specialty of shoes for 'bus drivers, and his greatest claim for them was that they were unusually warm. He kept a pair of shoes imbedded in a cake of ice in his shop window, and any one could walk in and feel the inside of them and see that they were warm. A hatter in Antwerp who manufactures a waterproof silk hat keeps one of them in his shop window suspended over a pan, with a stream of water running over it. I never passed this store once without seeing a crowd of people standing in front of it, and I don't doubt that this scheme brought him many a customer he would not have otherwise had.

"In Paris a firm of safemakers employed two men to stand in the window of their place all day and hammer on the lock of one of their safes with huge sledge hammers. The novel designs that confectioners and pastry cooks get up and put in their windows attract the attention and admiration of all foreigners. Every confectioner in Paris who goes in for window advertising at all has a big Eiffel Tower of candy in his window; but, fine as the Parisian displays are, they are not nearly so handsome as those in Brussels. The amount of cake and candy which is wasted in window decoration in the big Belgian cities is amazing. I can't see what use the sweets can be after the things are pulled apart, and certainly no one can have any use for a huge castle or figure made out of cake and candy, unless it is used as a centerpiece on a banquet table."

— THE WOMAN OF THE WORLD.—She entered the hardware store with the air of one who confers a favor on the earth by continuing to exist upon it. She was as portly as middle age and high living could make her and as slender as a tailor-made gown could force her to be. She looked through the clerk with her lorgnette and then said:

"Have you alabaster plates and cooking utensils?"

"Alabaster?" faltered the clerk. "I don't think we have, madame."

"Surely you have," she retorted wearily, as one who is very tired of having to teach people what they ought to know themselves. "All stores must keep them. They are quite common."

"We do not," replied the clerk deferentially, "or at least we do not call them by that name."

"Probably not," said madame contemptuously. "Then see if you recognize them under the name of fire proof."

"Oh!" cried the clerk, a great light breaking in upon his brain. "You meant asbestos, not alabaster."

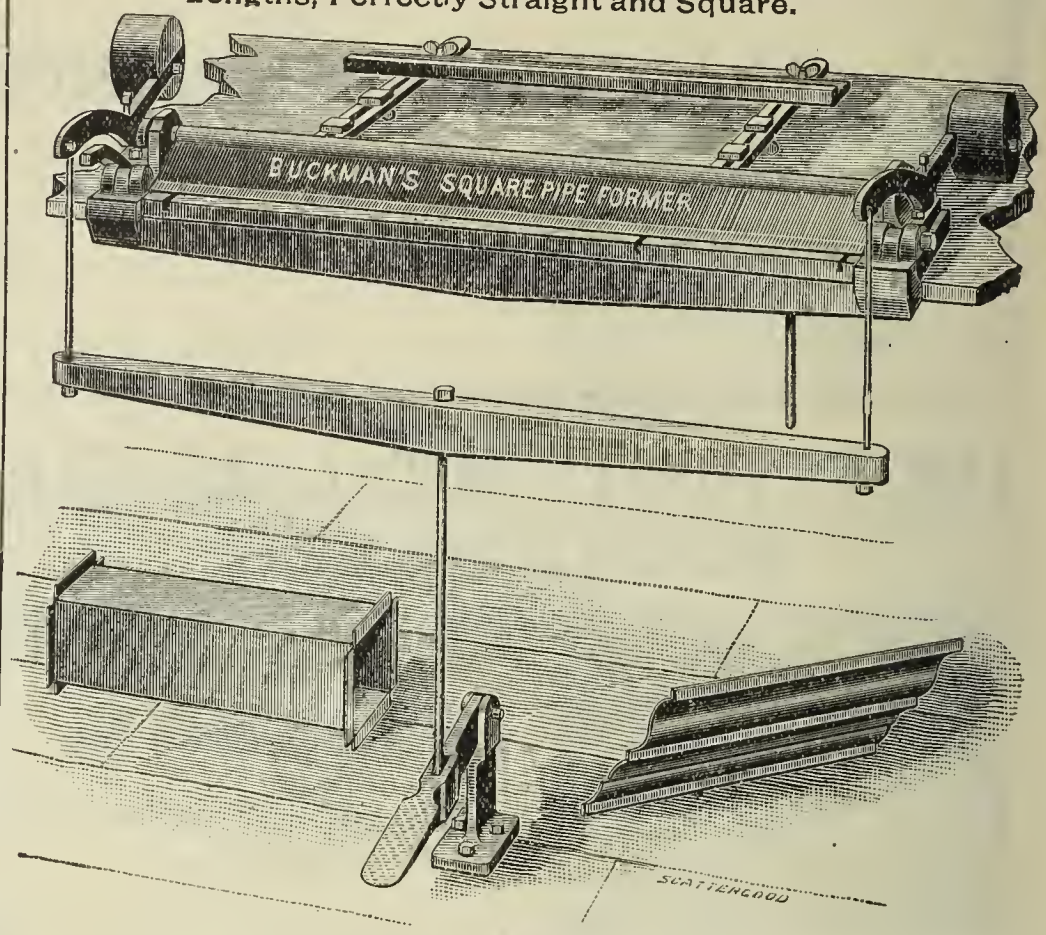
And for the next 15 minutes the stout, imposing lady had a little less the air of conferring a favor upon the community by living.—*Exchange.*

BUCKMAN'S

—IMPROVED—

SQUARE PIPE FORMER AND CORNICE BRAKE

Will form Square Pipe, Two Inches and Larger, in Thirty Inch Lengths, Perfectly Straight and Square.



Pat'd 5-28-89.

WRITE FOR PRICES.

P. B. CALVERT & CO., PHILADELPHIA.

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, MANLS, TOOLS, FELT, CEMENT, ETC.

QUARRIES, BANGOR, PA.

NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE

Kitchen Sinks,
Laundry Tubs,
Washstand Tops,
Marbleized Shelves,
Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also Mantels.

FAIRHAVEN, VERMONT.

SEND FOR CATALOGUE.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, . . EASTON, PA.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96–102 Reade Street, New York.



NIAGARA SNIPS.

NIAGARA

Tools and Machines for Sheet Metal Workers.

TINSMITHS' TOOLS,

A FULL LINE.

The Best and Most Improved

ROOFERS' TOOLS.

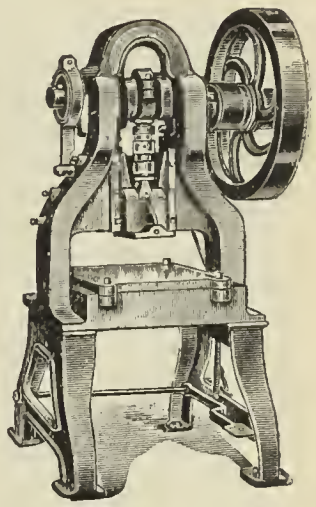
CAN MAKERS' TOOLS.

CORNICE MAKERS' TOOLS.

PRESSES AND DIES.

SQUARING, SLITTING AND CIRCLE SHEARS.

Complete Outfits for making Tinware, Cans and other Sheet Metal Goods.



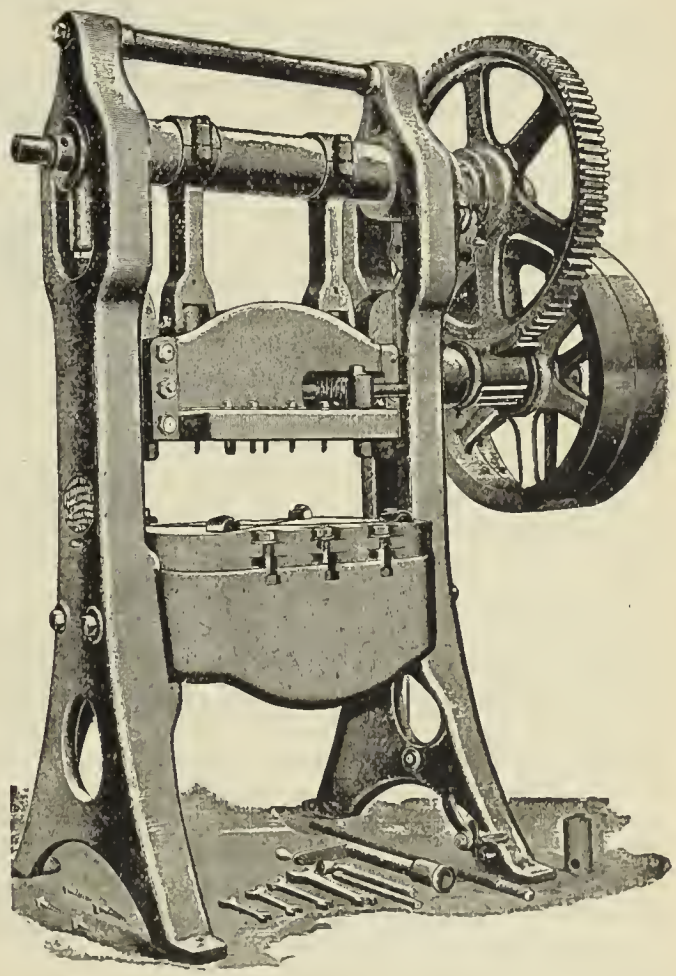
POWER ARCH PRESS.

—MANUFACTURED BY—

The Niagara Stamping & Tool Co.,

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**

Ferracute Machine Co.,



BRIDGETON, N. J., U. S. A.,

MANUFACTURERS OF

FOOT AND POWER

PRESSES, DIES

And other SHEET METAL TOOLS

OF ALL KINDS.

Please send for Illustrated Price-Lists describing 300 kinds Presses, every kind of Dies, Tinners Tools, Solder Apparatus, &c., for the manufacture of Cans, Tinware, Sheet Iron Goods, Lamps, Gas Fixtures and other Brass Goods, Silverware, Hardware and other Iron Goods of every kind.

Six sizes of New "Style C" Inclinable Presses, Heavy, Handsome, Durable and Very Popular.

TINNERS' MACHINERY AND SUPPLY CO.,

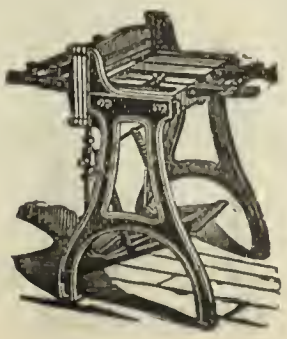
SUCCESSORS TO

HIBBERD & SPINNER,

9 CLIFF STREET, - NEW YORK CITY.

Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery. Presses, Dies and Can Makers' Tools.

FULL LINE OF SUPPLIES.



— "ARE you interested in golf, Mrs. Jennings?" asked young Simpkins, after racking his brains for some time for something to say.

"I'm not familiar with his works at all," replied the old lady. "What has he written?"—*Exchange.*

— BERTIE: "I wish your slippers had asbestos soles, mamma."

Mamma: "On account of the warmth?"

Bertie: "No, but because then they couldn't burn."—*Exchange.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

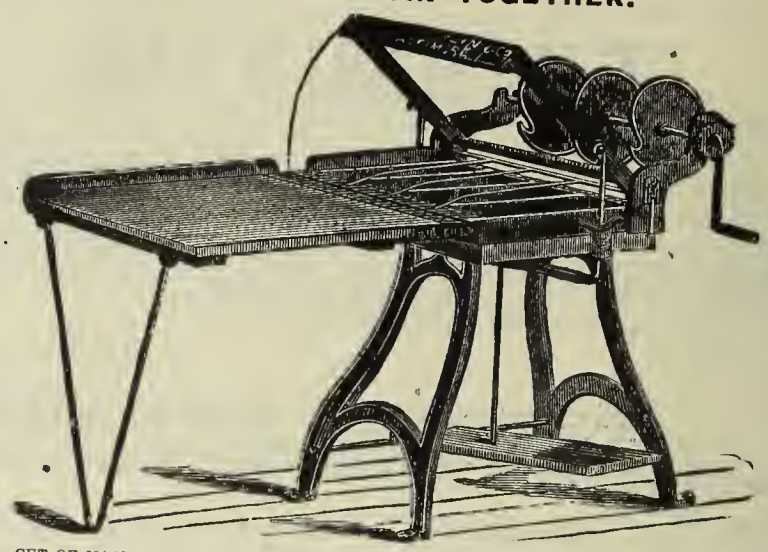
Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

First, for Rapidity of Work.

Second, for Quality of Work.

Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

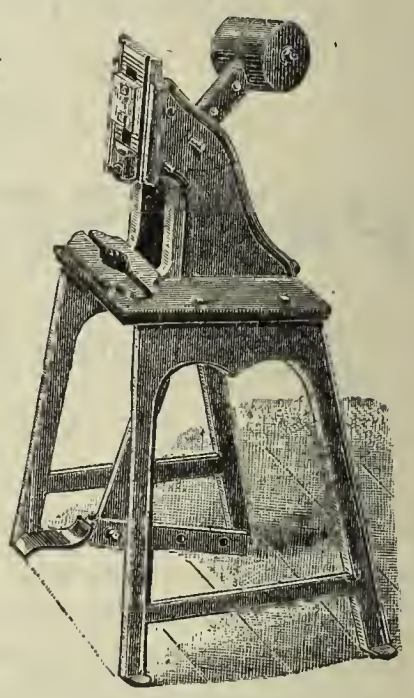
LYON, CONKLIN & CO.,

Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.

—OUR—

PENDULUM PRESSES



are suitable for a wide range of work. Grooved beds with sliding bolts for holding all sizes of dies. Perfectly fitted balanced, and adjustable to light and heavy blows. A first-class machine in every respect.

MANUFACTURED BY

G. A. Crosby & Co.,

176 & 178 So. Clinton St., CHICAGO, ILL., U. S. A.,

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap Makers', and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Brass Goods and all Hardware Novelties.**

Special Attention to Dies of every Description.

WORK GUARANTEED THE BEST.

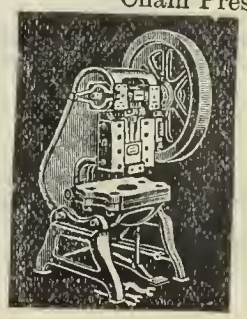
Write for Prices and New Catalogue containing full line of Tinners' Tools.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.

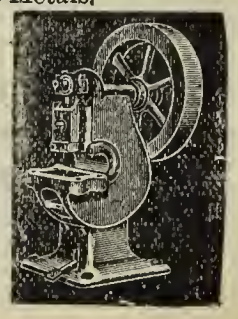
THE TOLEDO MACHINE & TOOL CO.,

MANUFACTURERS OF

Power Punching Presses, Drop Presses, Trimming Presses, Stamping Presses Riveting Presses, Embossing Presses, Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.



Send for Catalogue now being printed.



The Toledo Mach. and Tool Co.

Superior and Oak Sts., Toledo, O.

ALPHABETICAL LIST OF ADVERTISERS.

Acme Roofing & Supply Co.. 76
Ætna Standard Iron & Steel Co..... 71
Allen's Corrugating Wks... 75
American Boiler Co..... 22
American Radiator Co..... 1
American Roofing Co..... 76
American Sheet Iron Co..... 73
Apollo Iron & Steel Co 1
Armstrong Mfg. Co..... 67
Auld & Conger..... 59
Aurora Vapor Stove Co..... 9
Bailey-Farrell Mfg. Co..... 67
Bangor Excelsior Slate Co.. 80
Barstow Stove Co..... 88
Bascom, H. Clay.. 63
Belden, F. E. Mica Mining Co..... 55
Belding Mfg. Co.....20&21
Bellaire Stamping Co..... 56
Berger Bros..... 69
Berger, L. D..... 73
Bibb, B C. Stove Co..... 18
Black Diamond Tin Plate Works..... 71
Bliss, E. W. Co..... 86
Blodgett, G. S. Co..... 26
Bowen Mfg. Co..... 22
Bowers Roofing & Metal Wks 60
Brauer, A. G..... 63
Bridgeport Crucible Co..... 62
Brombacher's Sons, Jacob .. 87
Bronson Supply Co..... 61
Bruce & Cook.....74&88
Buffalo Register Works..... 26
Burtis, A. L..... 79
Burton, W. J. & Co..... 79
Calely, Ed. L..... 63
Calvert, P. B. & Co..... 80
Cambridge Iron & Steel Co.. 73
Canfield, H. O..... 64
Canton Steel Roofing Co..... 79
Carton Furnace Co..... 3
Central Oilgas Stove Co..... 7
Central Pattern Works..... 63
Central Stamping Co..... 58
Chamberlain, J. W. Co..... 70
Cheney, S. & Son..... 66
Chicago & Erie Stove Co..15&16
Cincinnati Corrugating Co.. 78
Cincinnati Stamping Co..... 27
Clad, V. & Sons..... 56
Clark, G. M. & Co..... 11
Clark Novelty Co..... 57
Clark, Quien & Morse .. 68
Clayton & Lambert Mfg. Co. 65
Clough, R. M 83
Colwell Lead Co..... 66
Connecticut Plating Co..... 52
Cooney, Selner & Co..... 68
Cope, Geo. W..... 63
Corning Mfg. Co. 18
Correspondence School of Mechanics..... 54
Cortright Metal Roofing Co. 77
Covert Mfg. Co..... 64
Craig-Reynolds Fdy. Co..... 16
Crosby, G. A. & Co..... 82
Curtis & Curtis..... 67
Dalton-Ingersoll Co..... 65
Day Mfg. Co..... 66
Dayton Mfg. Co..... 23
De Haven & Co..... 23
Dixon, Jos., Crucible Co..... 79
Douglas, W. & B..... 67
Dover Machine Works..... 83
Eddy Electric Mfg. Co..... 64
Electric Boiler Co..... 18
Eller, J. H. & Co..... 78
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 80
Ferracute Machine Co..... 81
Ferrosteel Co..... 14
Follansbee Bros. Co..... 72
Fostoria Steel Roofing Co... 77
Frink, I. P..... 88
Friedley & Voshardt..... 78
Froelich, A., Estate of..... 62
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 80
Garry Iron & Steel Roofing Co 77
Geuder & Paeschke Mfg. Co. 60
Giblin & Co..... 17
Glenmore Foundry & Machine Co..... 19
Globe Iron Roofing & Corrugating Co..... 77
Globe Ventilator Co..... 63
Gobeille Pattern Co..... 63
Gordon, W. J..... 86
Gorton & Lidgerwood Co..... 1
Graff & Co..... 16
Greene, W. F 57
Green, S. & Sons..... 77
Griswold Mfg. Co..... 57
Gummey, Spering & Co..... 71
Gurney Heater Mfg. Co..... 17
Gurney Refrigerator Co..... 22
Halliday, M 77
Hamilton, John..... 88
Hanson & Van Winkle Co... 64
Harrison, W. P. & Co... 64
Hart & Crouse 19
Hartford Hollow Ware Co.. 62
Haslet, Flanagen & Co..... 56
Hess, Snyder & Co..... 22
Highland Foundry Co..... 1
Highton, Wm. & Sons..... 26
Holton Iron Roofing Co..... 76
Howard Furnace Co..... 28
Howard Thermostat Co..... 22
Howson & Howson..... 54
Hull, M. L..... 64
Illinois Zinc Co..... 74
Indiana Ladder Co..... 59
Iwan Bros..... 64
Jackson's Sons, W..... 22
Jenkins Bros..... 1
Jersey City Galvanizing Co. 70
Johnson, E. J. & Co 80
Kanneberg Roofing Co..... 69
Kansas City Metal Roofing & Corrugating Co..... 73
Keen & Hagerty..... 59
Keene, Geo. C. & Co..... 83
Kelly, Thos. & Bro..... 65
Kemp, C. M Mfg. Co.... 67
Kendrick Valve & Washer Co..... 54
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 55
Kewanee Boiler Co..... 24
Kieckhefer Bros. & Co..... 58
Kieley, T..... 1
Kilbourne & Jacobs Mfg. Co. 65
Lawrence-Letts Elbow Co... 70
Lightning Dasher Egg Beater Co..... 62
Lindemann, A. J. & Hoverson Co..... 8
Littleford Bros..... 76
Lufkin Rule Co..... 86
Lyon, Conklin & Co... 82
McClure & Co..... 88
McDaniel & Harvey Co..... 74
McLain, J. H. Co..... 17
McLaughlin, J. K..... 63
Mahony, M..... 24
Marcy Stove Repair Co..... 62
Marlin & Co..... 68
Marston, I. G. & Co..... 66
Mason Regulator Co..... 1
Merchant & Co., Inc..... 73
Merry, Geo. E..... 71
Meurer Bros. Co..... 75
Mica Mfg. Co..... 55
Michigan Stove Co..... 10
Michigan Vapor Stove Co... 9
Millar, Chas. & Son..... 88
Miller, Jas. A. & Bro.....76&77
Miner & Peck Mfg. Co..... 86
Montross Metal Shingle Co.. 79
Mowry, W. C..... 26
Mullins, W. H..... 77
Munsell, E. & Co..... 55
Myers, F. E. & Bro..... 67
National Wringer Co..... 60
Newark Regulator Co..... 66
New Castle Steel & Tin Plate Co..... 71
New York Central Iron Wks. 18
New York Elbow Co..... 62
New York Iron Roofing & Corrugating Co..... 78
New York Nickel Plating & Mfg. Co..... 59
Niagara Stamping & Tool Co. 81
Niles Mfg. Co..... 60
North Bros. Mfg. Co..... 58
Obdyke, W. A. & Co..... 68
Obermayer, S. Co..... 62
Ohl, Geo. A. & Co..... 86
Osborn, J. M. & L. A..... 69
Ostrander, W. R. & Co..... 57
Packard Enameling Co..... 55
Page Boiler Co., Wm. H..... 26
Palermo Mica Co..... 55
Pancoast, Henry B. & Co.... 70
Paxson, J. W. & Co..... 62
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co... 67
Peck-Williamson Heating & Ventilating Co..... 4
Penn Iron Roofing & Corrugating Co..... 79
Perry Stove Co..... 13
Phelps, Dodge & Co 72
Phillips Tin Plate Works.... 71
Pontyminster Old Style Ternes..... 73
Poorman Mfg. Co..... 87
Portsmouth Stove & Range Co..... 15
Presbrey Stove Lining Co... 63
Putnam Foundry & Machine Co..... 19
Rathbone, Sard & Co..... 12
Republic Iron Works, ... 75
Ringen Stove Co..... 2
Robinson, J. M. & Co..... 87
Rochester Stamping Wks.... 59
Rome Mfg. Co..... 61
Root, A. L..... 79
Rutland Fire Clay Co.... 63
St. Louis Corrugating Co.... 79
St. Louis Stamping Co.. 61
S S. S. Conductor Co..... 69
Salem Nail Co..... 79
Sanborn, John..... 79
Saunders' D. Sons..... 66
Savill, Walls & Co..... 70
Sayre Stamping Co..... 57
Schaffer, J. P..... 24
Schneider & Trenkamp Co.. 25
Severding, John..... 66
Sheppard, Isaac A. & Co..... 1
Silver & Co 61
Sims Mfg. Co. 70
Smith & Winchester Co..... 19
Smith Co., H. B..... 24
Smith, J. D. Foundry Supply Co..... 63
Souther, E. E. Iron Co..... 73
Special Notices..... 54
Sperry, D. R. & Co..... 61
Standard Lighting Co..... 6
Star Mfg. Co..... 56
Stebbins, E. Mfg. Co..... 66
Steel Clad Bath Co..... 66
Stellwagen & Kynoch..... 55
Stiles & Parker Press Co.. 86
Stocking, E. B 54
Stuart & Peterson Co..... 66
Sykes Iron & Steel Roofing Co 77
Taplin, Rice & Co..... 15
Tarbox Mfg. Co..... 62
Taylor Co., N. & G..... 88
Tinners' Machinery & Supply Co..... 81
Tinplate Decorating Co..... 79
Toledo Machine & Tool Co.. 82
Troy Nickel Works..... 27
Tuttle & Bailey Mfg. Co. 26
Union Heater & Supply Co.. 54
United States Heater Co.... 24
Valentine, M. D. & Bro. Co... 63
Van Namee, G. L. Mfg. Co.... 55
Van Noorden, E. & Co. 79
Vedder Pattern Works..... 63
Vogel, William & Bros..... 60
Walther & Christman..... 68
Warren Hardware Co..... 14
Washburne, E. G. & Co..... 63
Wayne, Jos. W..... 22
Weathered's, Thos. W. Sons 23
Western Stove & Mfg. Co.. 8
Wheeling Corrugating Co... 77
Wister, L. & R. & Co..... 88
Wolff, L. Mfg. Co..... 56
Wood, Alan Co..... 75
Wood Co., W. Dewees. 88
Yates & Co..... 54
Zero Valve Co..... 66
Zucker, Levett & Loeb Co... 64

COMBINED

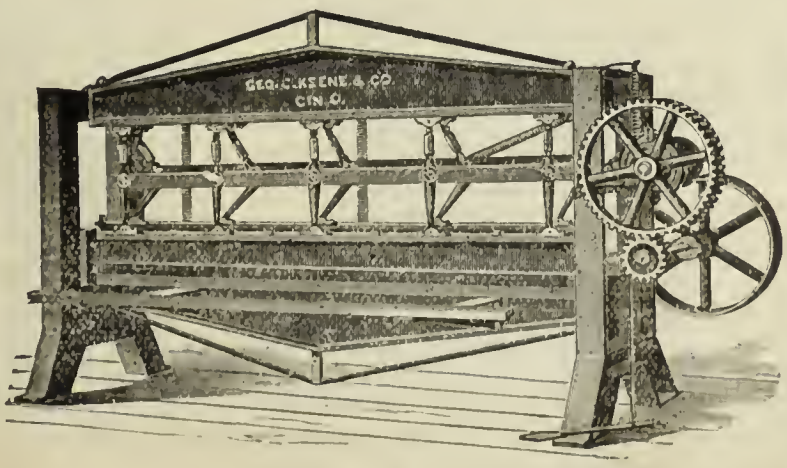
Crimper and Corrugator.

Outfits for Iron Roofing Establishments a Specialty.

GEO. C. KEENE & CO.,

Cincinnati, Ohio,

Makers of the KEENE CORNICE BRAKE.



PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

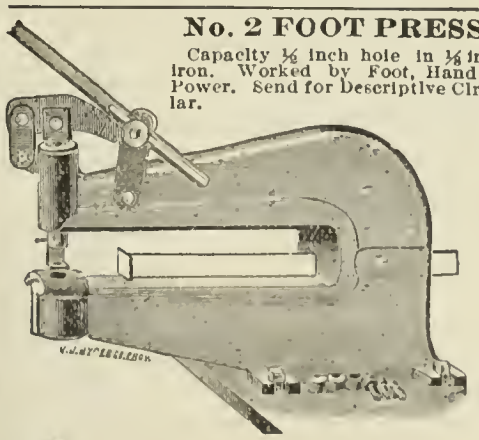
Estimates given at sight of samples of drawing or work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS, Dover, Del.

No. 2 FOOT PRESS.

Capacity ½ inch hole in ⅛ inch iron. Worked by Foot, Hand or Power. Send for descriptive Circular.



R. M. CLOUGH, - Tolland, Conn.

CLASSIFIED LIST OF ADVERTISERS.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield, H. O., Bridgeport, Conn.

Bathtubs.
Dalton-Ingersoll Co., Boston, Mass.
Day Mfg. Co., Detroit, Mich.
Peck Bros. & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.
Stuart & Peterson Co., Phila., Pa.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N.J.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Chency, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
Eller, J. H. & Co., Canton, O.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Cement.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing & Supply Co., Canton, O.
Allen's Corrugating Works, Chicago, Ill.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A. & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford, Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Ferracute Machine Co., Bridgeton, N.J.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Corrugating Works, Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.

Cream Can Fittings.
Geuder & Paeschke Mfg. Co. Milwaukee, Wis.

Cresting.
Green, S. & Son, Des Moines, Iowa.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Selner & Co., Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Clark, Quien & Morse, Peoria, Ill.
Proudman Bros., Meriden, Conn.
Severding, Jno., Richmond, Ind.
Walther & Christman, Cleveland, O.

Egg Beaters.
Lightning Dasher Egg Beater Co., Toledo, Ohio.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N Y.

Electric Dynamo Mchines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winckle Co., Newark, N.J
Zucker, Levett & Loeb Co., 8-14 Grand St., New York.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Foundry Facings Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Craig-Reynolds Foundry Co., Dayton Ohio.
Frout Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Peck, Williamson Heating and Ventilating Co., Cincinnati, O.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.

Furnaces, Plumbers' and Tinners'.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Hull, M. L., Cleveland, O.
Union Heater Supply Co., Detroit, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.
Packard Enameling Co., Warren, O.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y.
Poorman Mfg. Co., Canton, Ohio.

Heaters, Steam and Hot Water.
American Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Fuller & Warren Co., Troy, N. Y.
Glenmore Foundry & Mch. Co., Phila., Pa.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
McLain, J. H. Co., Canton, Ohio.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Smith Co., H. B., 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass.
United States Heater Co., Detroit, Mich.
Weathered's, Thos. W. Sons, 139-143 Centre Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Stuart & Petersou Co., Philadelphia, Pa.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Eric, Pa.
Silver & Co., Brooklyn, N. Y.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti. Mich.

Ice Cream Freezers.
North Bros. Mfg. Co., Phila., Pa.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalamcined.
Republic Iron Works, Pittsburgb, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Piqua, Ohio.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Lacquers and Japans.
Hanson & Van Winkle Co., Newark, N. J.

Ladders.
Indiana Ladder Co., Indiana, Pa.

Lamp Stoves and Heaters.
Ceutral Oilgas Stove Co., Boston, Mass.
Perry Stove Co., Albany, N. Y.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
Penn Iron Roofing & Corrugating Co., Ltd., Philadelphia, Pa.

Metallic Lathing.
Jersey City Galvanizing Co., 112 John St., N. Y.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Obermayer, S. & Co., Cincinnati, Ohio.
Smith, J. D. Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand Street, New York.

Oil Cans.
Central Oilgas Stove Co., Boston, Mass.
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges, Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Pattern Charts.
Burtis, A. L., Lockport, N. Y.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L. Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, John K., Phila., Pa.
Vedder Pattern Works., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Plating Co., Phila., Pa.

Plating Machines.
Glay & Co., Columbus, O.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers' Slate.
Fairbaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgb, Pa.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Hull, M. L., Cleveland, O.
Kelly, Thos. & Bros., Chicago, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Union Heater Supply Co., Detroit, Mich.
Wolff, L. Mfg. Co., Chicago, Ill.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Cbicago, Ill.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water.
American Radiator Co., Chicago, Ill.
Exeter Machine Works, Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., N. Y.

Refrigerators.
Belding Mfg. Co., Belding, Mich.
Bower Mfg. Co., Fond du Lac, Wis.
Gurney Refrigerator Co., Foud du Lac, Wis.
Wayne, Jas. W., Cincinnati, Ohio.

Registers.
Buffalo Register Works, Buffalo, N. Y.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman Street, New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N.Y.
Silver & Co., Brooklyn, N. Y.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel, Corrugated and Plain.
Acme Roofing & Supply Co., Canton O.
American Roofing Co., Cincinnati, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, O.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing & Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Penn Iron Roofing & Corrugating Co., Ltd., Philadelphia, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
Souther E. E. Iron Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGE 83.

Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Lyon, Conklin & Co., Baltimore, Md.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

Sap Spouts.
Miliar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co., Toledo, O.

Shingles and Tiles, Metallic.
Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing & Corrugating Co., Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Wolff, L. Mfg. Co., Chicago, Ill.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.

Slaters' Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, Y. Y.
Salem Nail Co., 292 Pearl St., N. N.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Steam Cookers.
Cincinnati Stamping Co., Cincinnati, O.

Steam & Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Pattern.
Bascom, H. Clay, Troy, N. Y.
Caiely, Edw. L., Philadelphia, Pa.
Central Pattern Works, Dayton, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Stellwagen & Kynoch, St. Ignace, Mich.
Van Namee, G. L. Mfg. Co., Gouverneur, N. Y.

Stoves and Ranges.
Bibb, B. C. Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
Clad V. & Sons, Philadelphia, Pa.
DeHaven & Co., Pittsburgh, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co., Boston, Mass.
Michigan Stove Co., Chicago, Ill.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Rathbone, Sard & Co., Albany, N. Y.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Taplin, Rice & Co., Akron, O.
Warren Hdw. Co., Warren, Ohio.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Perry Stove Co., Albany, N. Y.

Stoves and Ranges, Oil, Vapor and Gasoline.
Aurora Vapor Stove Co., Cleveland, O.
Barstow Stove Co., Providence, R. I.
Central Oilgas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill.
Dayton Mfg. Co., Dayton, O.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Michigan Vapor Stove Co., Grand Rapids, Mich.
Perry Stove Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Western Stove & Mfg. Co., Milwaukee, Wis.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Pattern Rules.
Lufkin Rule Co., Saginaw, Mich.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Black Diamond Tin Plate Wks., Phila., Pa.
Bruce & Cook, 186 to 190 Water St, N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila. Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Keen & Hagerty, Baltimore, Md.
Kleckhefer Bros. & Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Acme Roofing & Supply Co., Canton, O.
Berger, L. D., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N.Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, Geo. A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.

Torches, Plumbers' and Tinners.'
Kendrick Valve & Washer Co, Syracuse, N. Y.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 83.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA, AND MEXICO. - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - - -	$1.00	SIX MONTHS, - - - - - - -	$22.10
ONE MONTH (5 Times), - - - - -	5.00	ONE YEAR, - - - - - - - -	40.30
THREE MONTHS, - - - - - -	12.35		

Rates for larger spaces quoted on application.

DAVID WILLIAMS, Publisher.

96, 98, 100 and 102 Reade Street, NEW YORK. — **59 Dearborn Street, CHICAGO.**

New York (Main Office), - -	96-102 Reade Street, - - - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509 Hamilton Building, - - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - - - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - - -	HENRY SMITH, Manager.
St. Louis, - - - - - -	Bank of Commerce Building, - - - - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.
AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

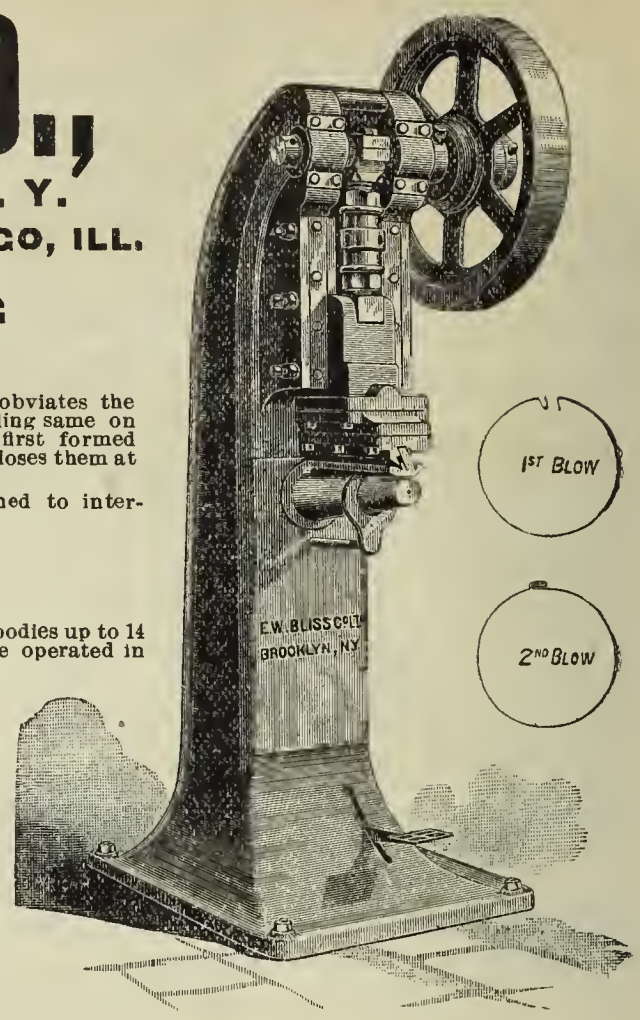
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.

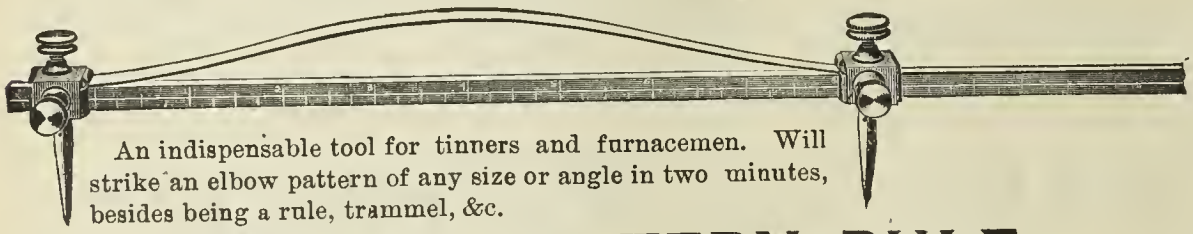


PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

DIES, SPECIAL MACHINERY &c.

THE STILES & PARKER PRESS CO.



An indispensable tool for tinners and furnacemen. Will strike an elbow pattern of any size or angle in two minutes, besides being a rule, trammel, &c.

"MAGIC" PATTERN RULE.

Price Reduced to $3.50 Net Cash.

Complete with Chart. Will pay for itself in a short time.

Send for Descriptive Circular.

LUFKIN RULE CO.,

SAGINAW, MICH.



— "I'M saving up to buy you a Christmas present, grandpa," said Willie.

"That's very nice of you, my boy," said the old gentleman. "How much have you got?"

"Well," Willie replied, "if you'll give me ten cents, I'll have eleven altogether."—*Harper's Young People.*

— TRUE ENOUGH.—The Lady: "I should think a healthy looking man like you would be ashamed to beg."

The Tramp: "It's becoz I'm healthy that I hav ter beg, mum. If I had the dispepsey, for instance, I wouldn't trouble myself so much about vittles."—*The Press.*

— DIFFERENT —Hicks: "I'd be ashamed to raise such a row about having my face washed."

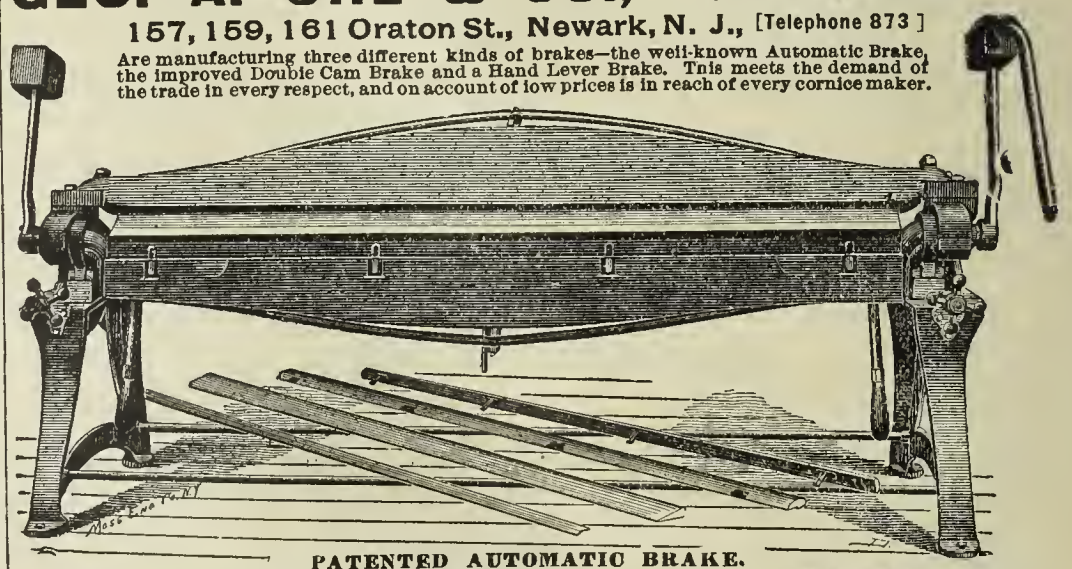
Dick Hicks: "That's all very well to talk for a man; when your face gets dirty you can go and get shaved."—*The World.*

GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co.,

157, 159, 161 Oraton St., Newark, N. J., [Telephone 873]

Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892. Send for our illustrated catalogue.

PATENT AUTOMATIC CAN BODY

SEAMERS.

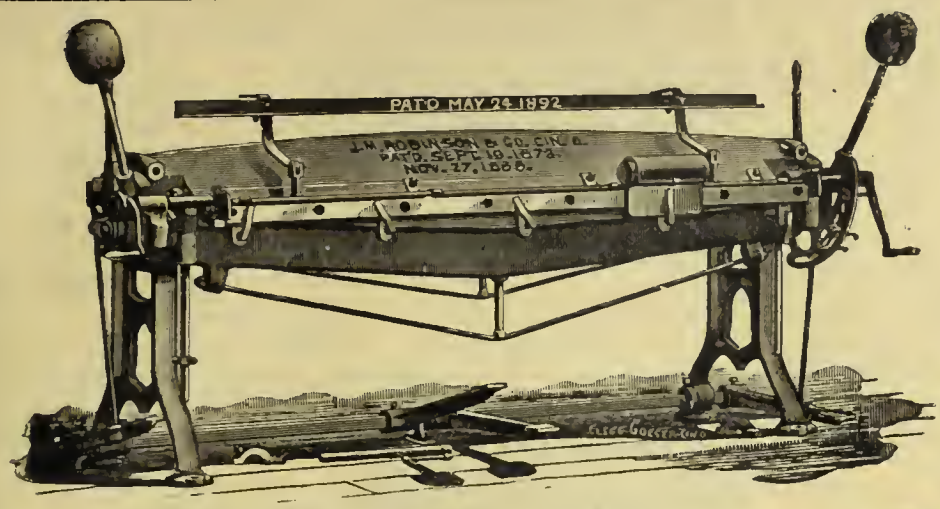
COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.

218 New St.,

W. J. GORDON, PHILADELPHIA, PA.

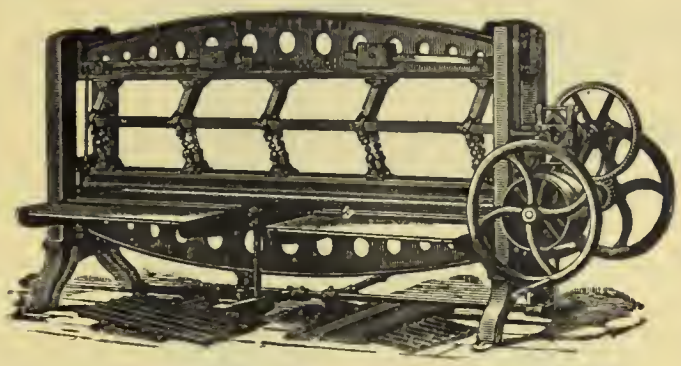


ROOFING MACHINE.

With Dies suitable, will form Sheet Metal Roofing, Siding, Ceiling, Weather-Boarding, Skylight Bars, Metal Lathing, Gutters, Ridge Caps, Escalloped Steel Sheets and Cattle Troughs,

THE "GLOBE" CORNICE BRAKE.

With which to form Sheet Metal into Cornice Mouldings, Ridge Caps, Skylight Bars; and with Beader and Gutter Former attached to Brake (price of which is extra), Bead and Form Gutters. Cornice manufacturers' Steel Straight Edges, 30 inch to 10 foot lengths.



J. M. Robinson & Co., Mfrs.,

225-229 W. Second St., Cincinnati, Ohio, U. S. A.



All set up ready to use. Price, $30.00. Freight allowed to points as far West as Missouri River, and as far South as Galveston, Tex.

FOR SALE BY

Hall & Carpenter, Philadelphia, Pa.
Austin & Dolen, Boston, Mass.,
Hackett Hdw. Co, St. Paul, Minn.
and jobbers generally.

If your jobber can't supply you, order direct of the manufacturers.

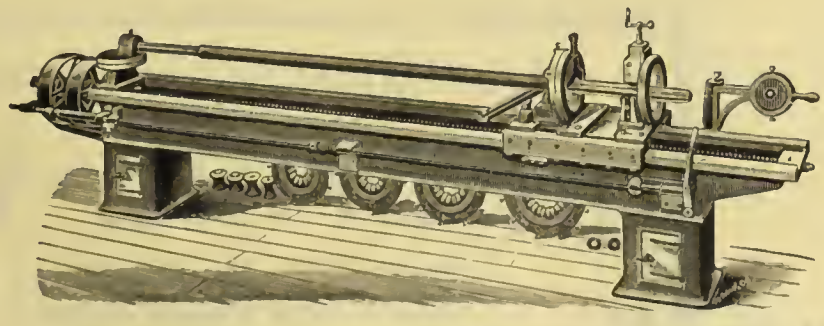
SEND FOR CATALOGUE.

Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

JACOB BROMBACHER'S SONS, - **No. 30 Cliff St., N. Y City.**

Established 1833. Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens. chattel mortgages, and nearly 300 approved forms which have been tested in courts.

Sent, post-paid, on receipt of price, by

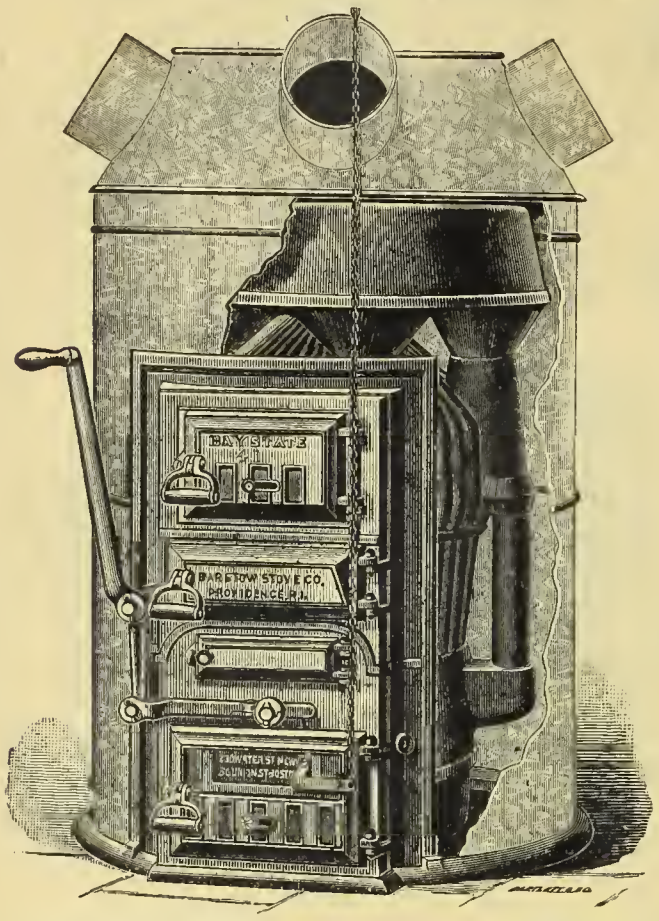
DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade Street, New York.

THE CELEBRATED

"Bay State" Furnace.

All Cast Iron, with Self-Cleaning Flues.
Adapted for Hard or Soft Coal.



Why not get our prices and send for descriptive circular?

BARSTOW STOVE COMPANY,

INCORPORATED,

BOSTON. PROVIDENCE, R. I. **NEW YORK.**

Tin for Door Linings.

12 X 24		14 X 22
13 X 26	Primes and	11 X 22
13½ X 19½	Wasters.	15 X 21
14 X 18¾	Light Weight	16 X 20
14 X 19¼	and	16 X 22
14 X 20	Full Weight.	20 X 20
14 X 21		20 X 28

Furnace Pipe Tin, IC and IX.

20 X 23	for 7	inch	pipe.
20 X 26	" 8	"	"
20 X 28	" 8	"	"
20 X 29½	" 9	"	"
20 X 32½	" 10	"	"
20 X 38½	" 12	"	"

ORDERS FILLED PROMPTLY.

N. & G. TAYLOR CO.,

Manufacturers of Tinplate,

PHILADELPHIA.

THE GREAT CHURCH LIGHT REFLECTORS FOR OIL, GAS OR ELECTRIC LIGHT
I. P. FRINK.
551 PEARL. ST. N.Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK,

TINNERS' TOOLS and MACHINES,

TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOOK.

By far the best Spout made. Greatly improved this season. More used every year than all others combined. Sold by leading jobbers everywhere, and to them by

CHARLES MILLAR & SON, Utica, N. Y.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY.

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON.

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
Jannary 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. **Also** WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh. Pa.

HAMILTON'S
BEST REDIPPED AMERICAN ROOFING TIN

is DIPPED AND REDIPPED by HAND, and is NOT coated by machines through ROLLS like some plates that are lauded so highly by the makers, and the coating on Hamilton's Best Redipped is as heavy on the TOP half of the sheet as it is on the BOTTOM half. You have scales, test it. We can furnish machine coated plates with 20 lbs. of coating to the box of I. C. 20 x 28 at $11.50 per box, fully equal to any of the so-called extra coated plates.

JOHN HAMILTON,

PITTSBURGH, PA.

Our Guaranteed Brands

—OF—

ROOFING TIN

McClure's Re-Dipped,
McClure's Hand Coated,
O. B. T. Extra Coated.

McCLURE & CO.,

TIN PLATE AND METALS,

62 Second Avenue, PITTSBURGH, PA.

Index to Reading Matter, Page 55

Index to Advertisements, Pages 91-93.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

..XLIII. MBER 9. | NEW YORK AND CHICAGO, MARCH 2, 1895. | ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.



NATIONAL.

AMERICAN RADIATORS (TRADE-MARK.) BEST ON EARTH.

HANDSOME DESIGNS,
PERFECT CONSTRUCTION,
LARGEST ASSORTMENT.

AMERICAN RADIATOR COMPANY

111 and 113 Lake Street, CHICAGO, ILL.

New York. 45 Centre St. | Boston. 44 Oliver St. | Minneapolis. 330 First St., North. | Denver. 1810 Blake St.

Factories: DETROIT AND BUFFALO.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F&W Co.

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.

FULLER & WARREN CO. TROY N.Y.

HOT AIR PARAGON FURNACES

ISAAC A. SHEPPARD & CO.
MANUFACTURERS
PHILADELPHIA, PA.
AND
BALTIMORE, MD.

SIX POINTS

1. FEWEST JOINTS. 2. EQUALIZED DRAFT
3. LARGEST RADIATING SURFACE
4. ABSOLUTELY SELF CLEANING
5. BALL BEARING GRATE
6. PERFECT ADAPTABILITY TO ANY KIND OF FUEL.

OUR FURNACE BOOK "HINTS ABOUT HEATING" MAILED FREE
IT WILL INTEREST YOU.
IT MAY
HELP YOU

APOLLO BEST BLOOM

is the brand of galvanized iron that is true to gauge, flat (does not buckle), and is uniformly workable bends without weakening).

GALVANIZED IRON

A first-class worker in galvanized iron knows, to his cost, the difficulties, in exacting work, imposed by refractory metal and sheets not flat, and the losses incurred through varying thickness.

EVERY SHEET GUARANTEED

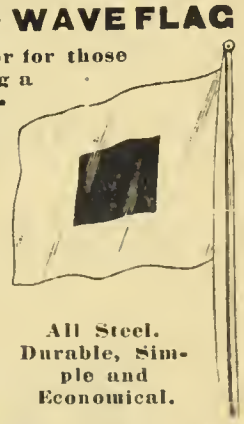
The extra cost is too small to appear in small sales. The actual cost of his job to the worker is less, if well done

APOLLO IRON AND STEEL COMPANY
Pittsburgh Pennsylvania
WORKS AT APOLLO
Write for New Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES
HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.
"Kitchen Boiler Connections."
A Selection of Practical Letters and Articles
—RELATING TO—
Water Backs and Range Boilers.
Compiled from *The Metal Worker*.
71 Illustrations.
A Practical Helper. Price, $1.00.
DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG
Has no terror for those using a
FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.
All Steel. Durable, Simple and Economical.
Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.
EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO.,
Boston, Mass.

The Jenkins Automatic Air Valve has proved to be all we claimed for it—i. e., a Positive and Reliable Air Valve. The expansible plug is a special compound, and manufactured expressly for use in the Jenkins Automatic Air Valve. It does not deteriorate or lose its flexibility under the action of heat or steam. With the Jenkins Automatic Air Valve, you should connect with a drip pipe, thus insuring a positive circulation. We guarantee them to be as represented. Our Trade-Mark is on every valve.



JENKINS BROS., NEW YORK, BOSTON, CHICAGO, PHILADELPHIA

STEAM SPECIALTIES.
Pump Governors.
Steam Traps.
Steam & Water Reducing Valves.
Noiseless Back Pressure Valves.
Damper Regulators and Oil Separators.
Send for Circulars.



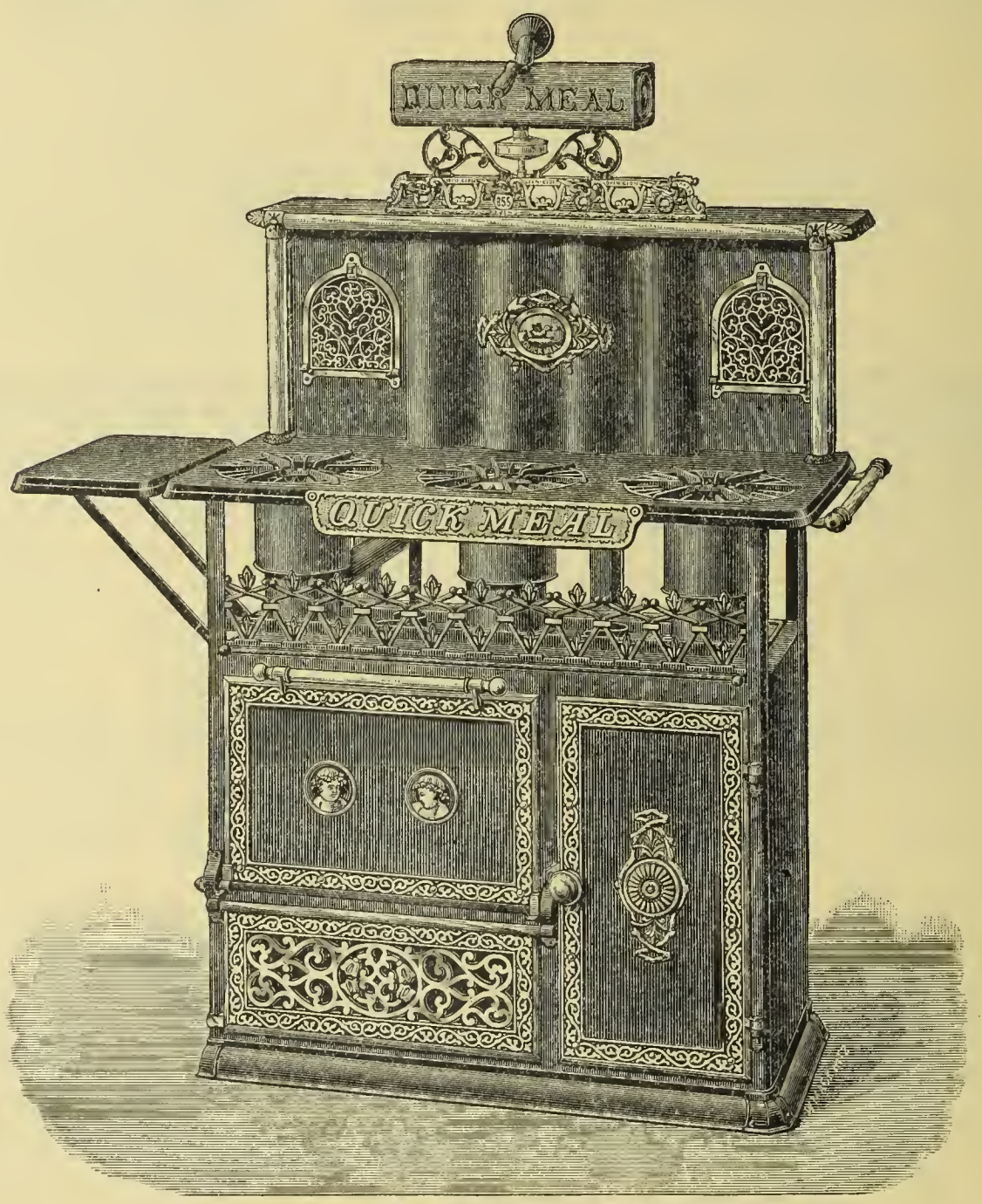
T. KIELEY, 7 to 11 W. 18th St., NEW YORK. Pressure Regulating Valve.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

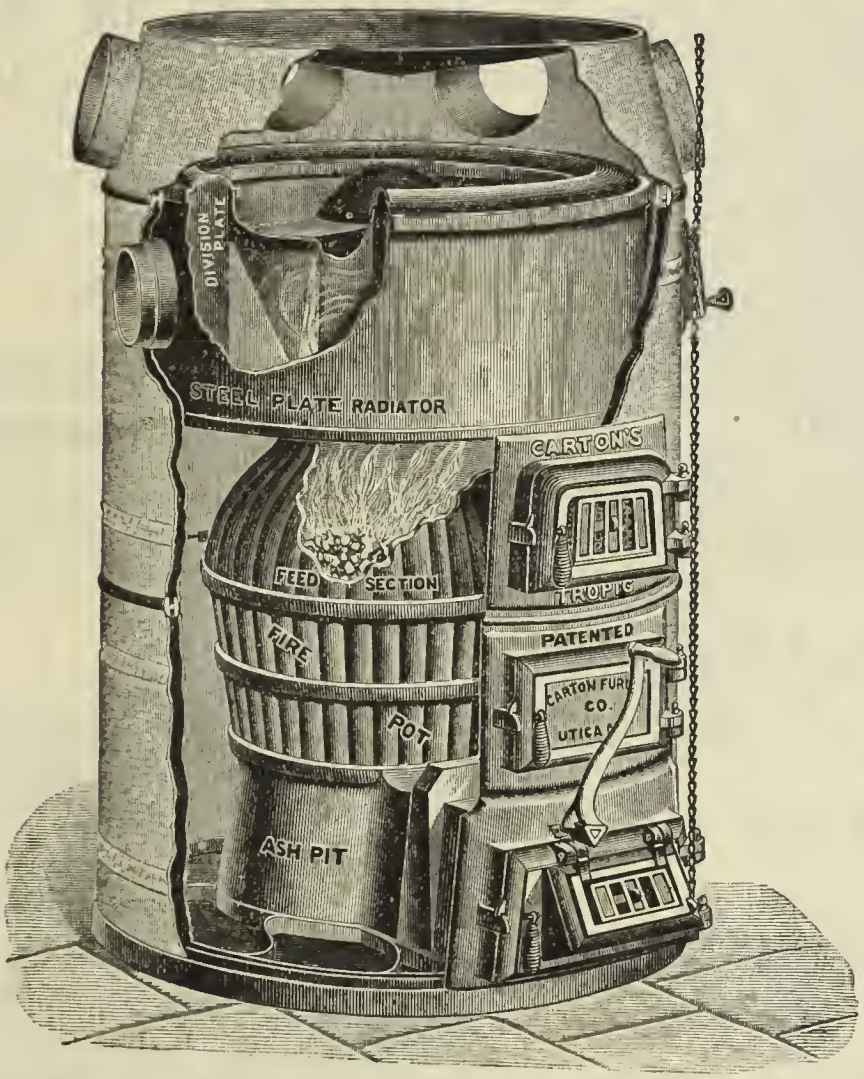
ST. LOUIS.

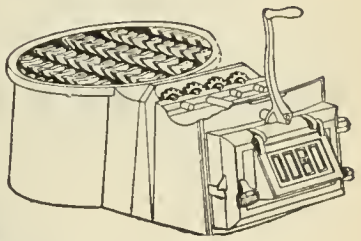
Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

Hot Water & Steam Boilers & Furnaces.

OUR TROPIC FURNACE.





Original "Smyth" Revolving Anti-Clinker. Grates.

COMBUSTION travels the **ENTIRE CIRCUMFERENCE** of the **RADIATOR.**

ORIGINAL "SMYTH" Triangular GRATES.

THOUSANDS IN SUCCESSFUL OPERATION.

EVERY FURNACE GUARANTEED.

STEEL PLATE OR CAST IRON RADIATOR.

PRICES TO SUIT THE TIMES.—Our Catalogue and Prices will interest you.

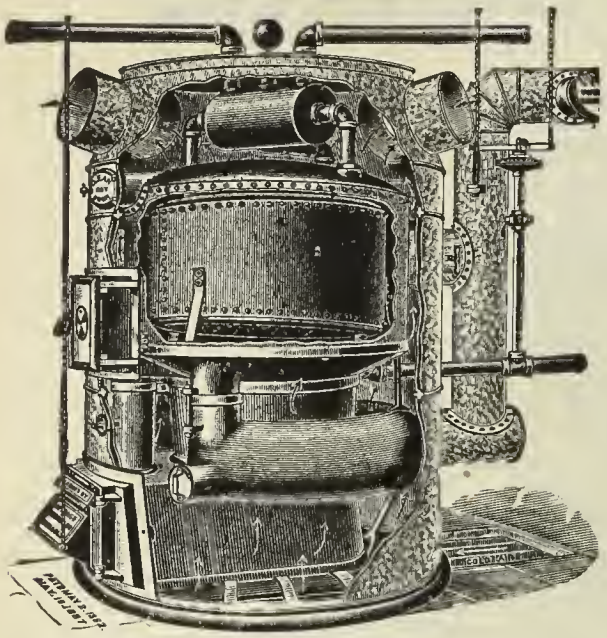
MANUFACTURED BY

CARTON FURNACE CO., UTICA, N. Y.

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

VAN'S Plantation Ranges.

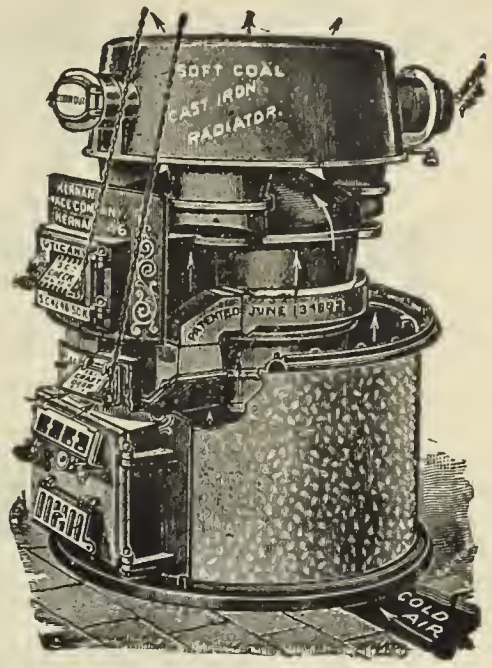
With Broiler Attachment.

The finest, most convenient and best family range ever offered for soft coal, wood or natural gas. Write for our prices before buying elsewhere. It will pay you.

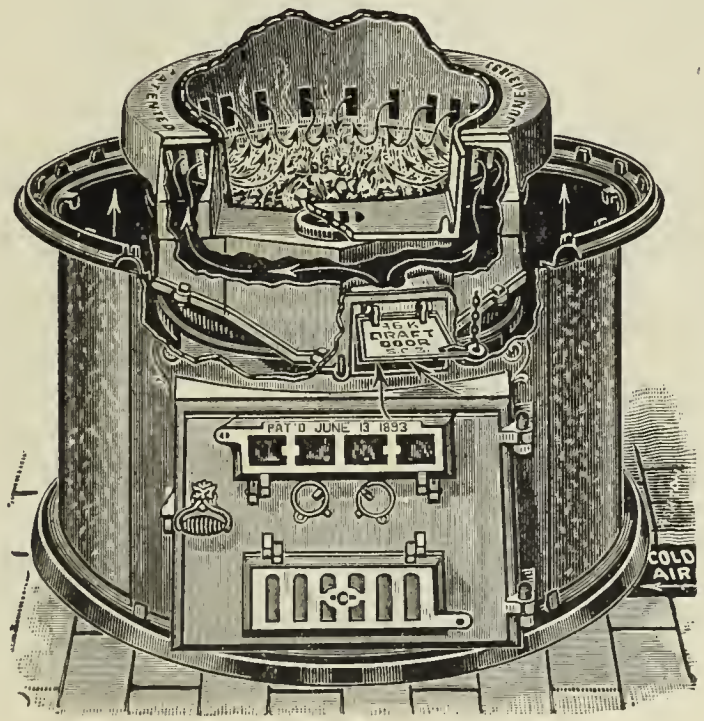


THE
JOHN VAN RANGE CO.,
Mfrs. of Wrought Steel Ranges, all sizes, and styles,
Cincinnati, Ohio.

KERNAN Smoke Consumers Lead



In all the sections of the country where soft coal is used.



SECTIONAL VIEW,

showing the principle in the Kernan Smoke Consumer Furnace of a heated current of air entering the fire-pot, igniting with and consuming the smoke from soft coal.

Now is the time to secure the agency and thereby control the furnace trade of your locality. Do not waste time and money experimenting on new and untried constructions. The

Kernan Smoke Consumers

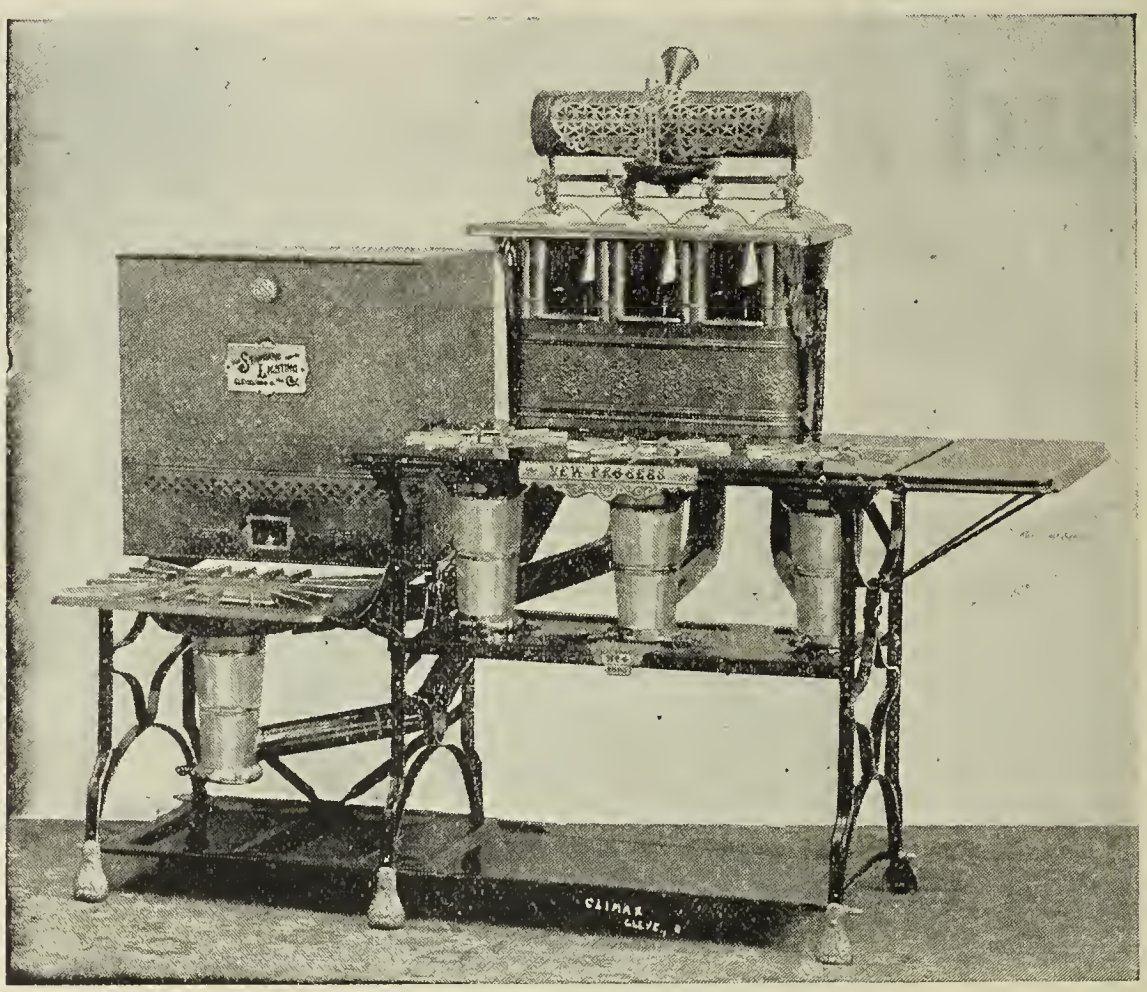
have been used for several years in all parts of the country and with every variety of soft coal, and are now conceded by the trade and public to be the only warm air furnace in which soft coal can be cleanly and economically used.

Send for Reference Catalogue of Soft Coal Furnaces.

Kernan Furnace Company,

71 W. Washington St., CHICAGO, ILL. UTICA, N. Y.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

——MADE ONLY BY——

THE STANDARD LIGHTING CO.,

CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
Milton Rogers & Sons, Omaha, Neb.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
H. Wetter Mfg. Co., Memphis, Tenn.

IMPORTANT ANNOUNCEMENT.

To Our Patrons and the Trade Generally:

Our new Catalogue for 1895 will be ready for distribution within a few weeks. We take this means of announcing in advance of its publication that we have very carefully studied the requirements of the trade in every particular, and that our lines will be complete. We will place on the market specialties in entirely new goods that will commend themselves both by reason of popular prices and their many attractive and desirable features. In addition to our very popular Oilgas Cook Stoves, containing our improved 1895 Burners that are giving such perfect satisfaction, we have something entirely new in the line of special Lamp Stoves at special prices; also Sheet Steel Circular Burner Oil Cook Stoves. Write for further information and prices.

CENTRAL OILGAS STOVE COMPANY,

—Manufacturers of—

Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes.

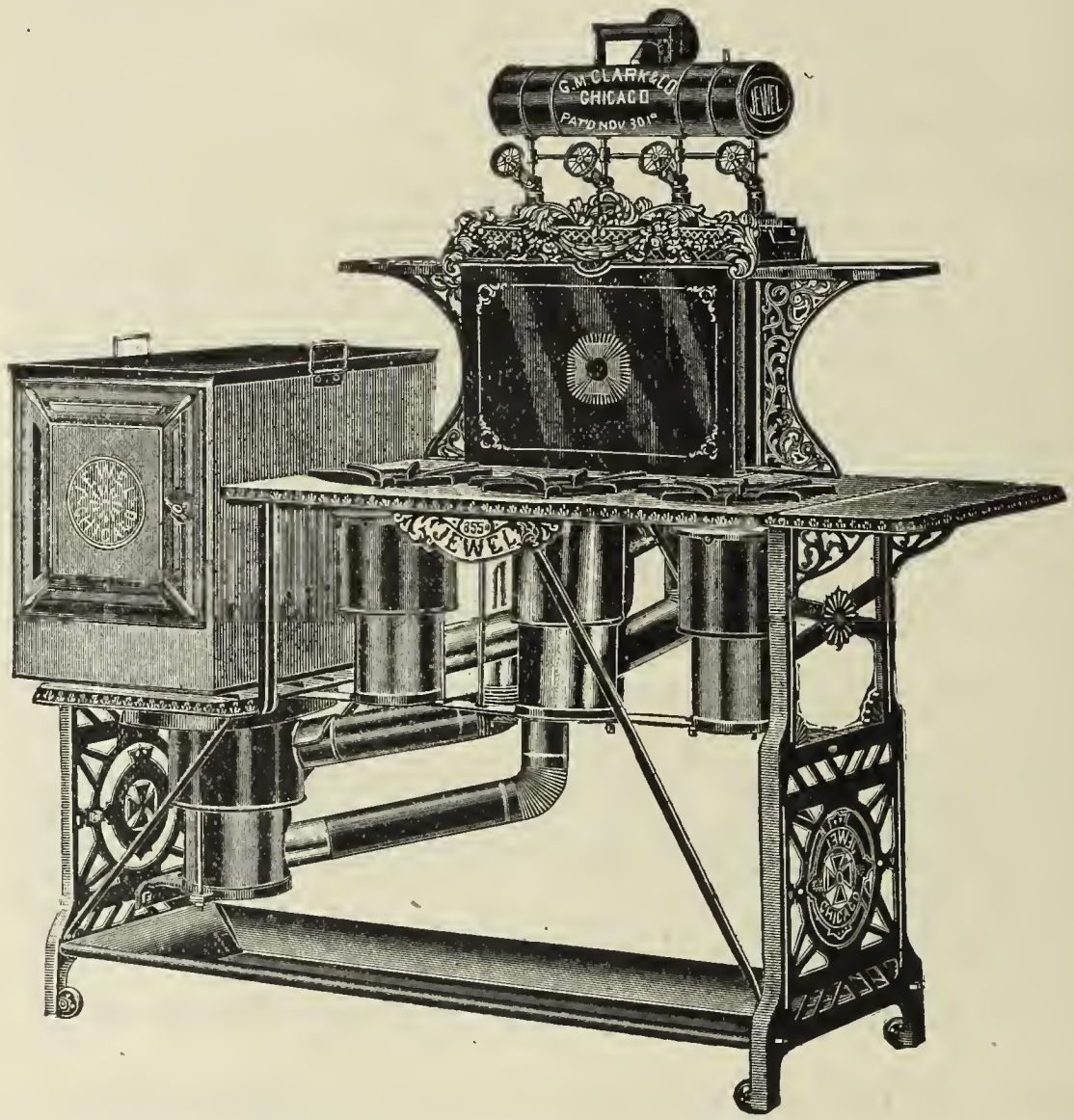
BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

WRITE FOR CATALOG.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

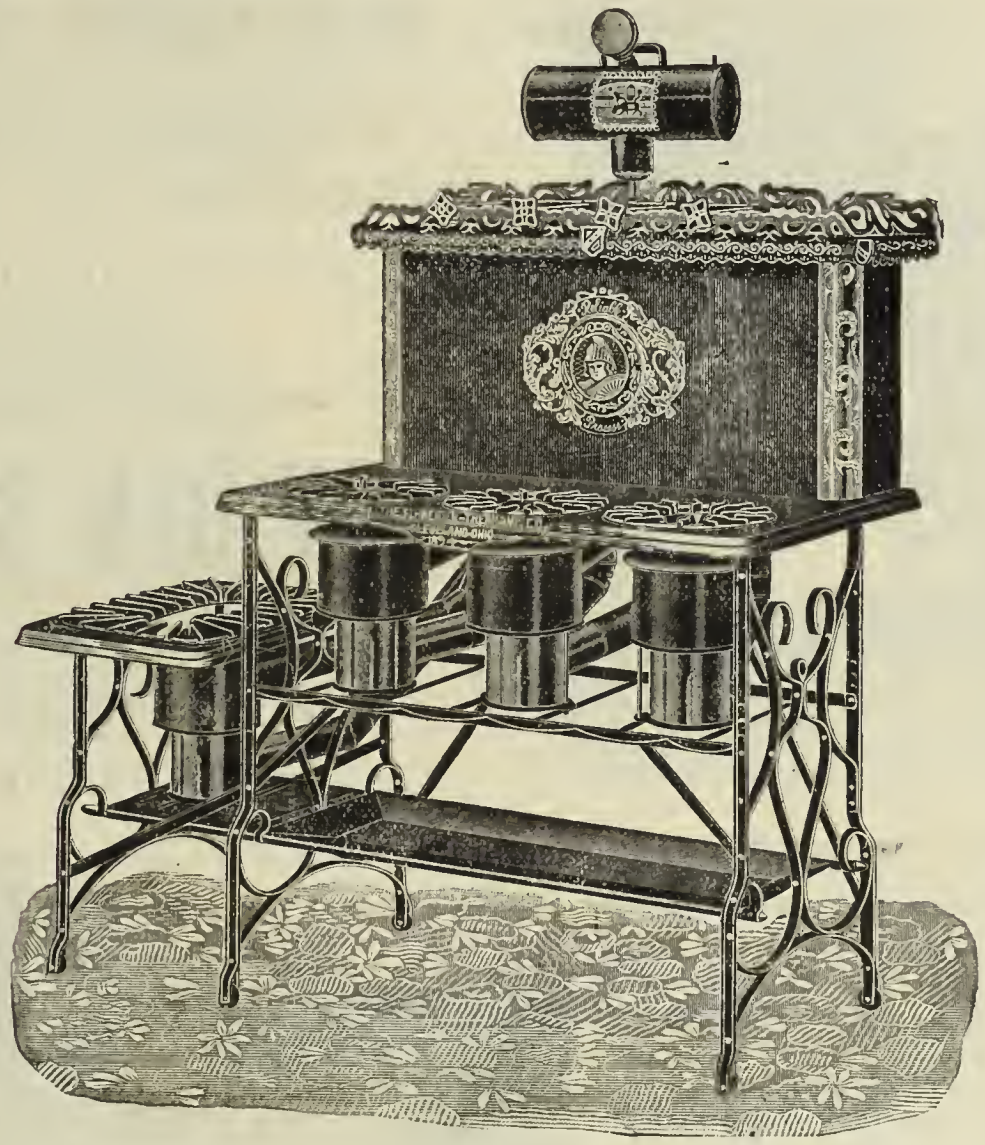
SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
BARSTOW STOVE CO., New York, N. Y.
W. W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

There are OTHERS,

But none that compare with the "Reliable."

SEE ? ? ?



This is not the only one,

Oh my, no. There ARE others,

as illustrated in our 1895 Catalogue, which can be had by writing

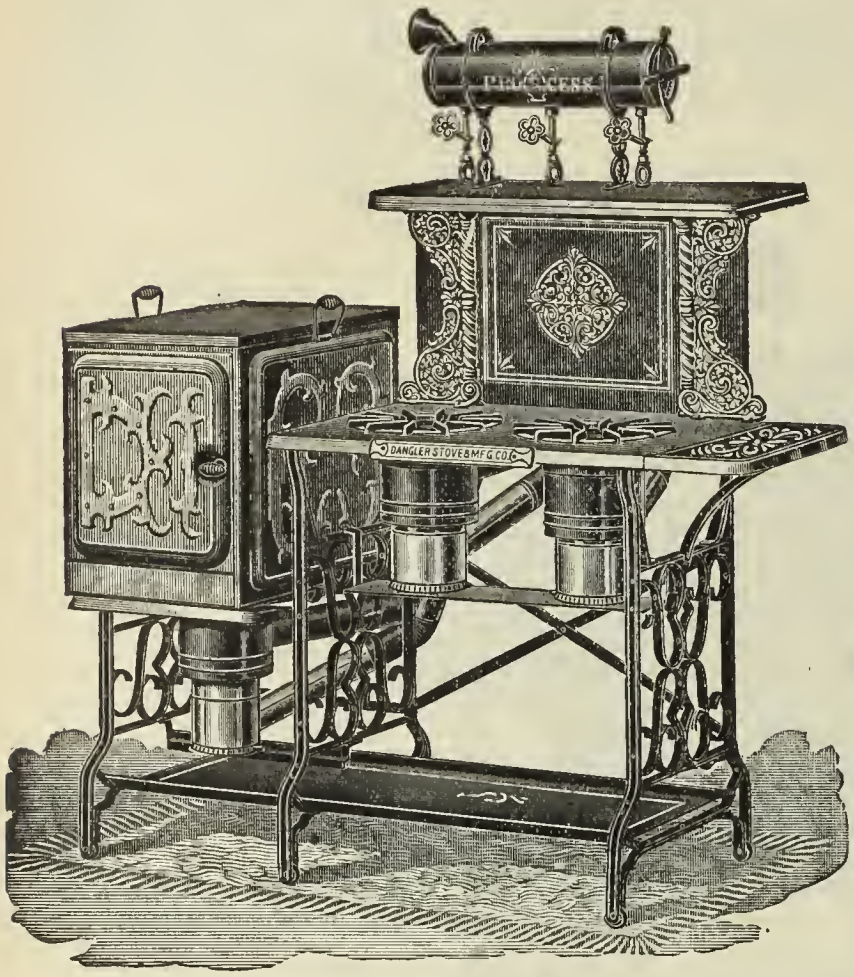
THE SCHNEIDER & TRENKAMP CO.,

67 Lake Street, Chicago. Cleveland, O.

OR OUR AGENTS:

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F FOX Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.
S. FAITH & CO., Philadelphia, Pa.—Eastern Pennsylvania and New Jersey.
HUNNICUTT & BELLINGRATH, Atlanta, Ga., and Vicinity.

Facts of Interest to the Public.



Our "PROCESS" for 1895, we can say unqualifiedly, is the

MOST PERFECT WORKING

PROCESS STOVE EVER PLACED ON THE MARKET, and HAS NO EQUAL.

In calling attention to our

NEW GEM STOVE,

We offer the trade a STOVE FOR THE PEOPLE and FOR THE TIMES.

THE GEM STOVE is CONVENIENT

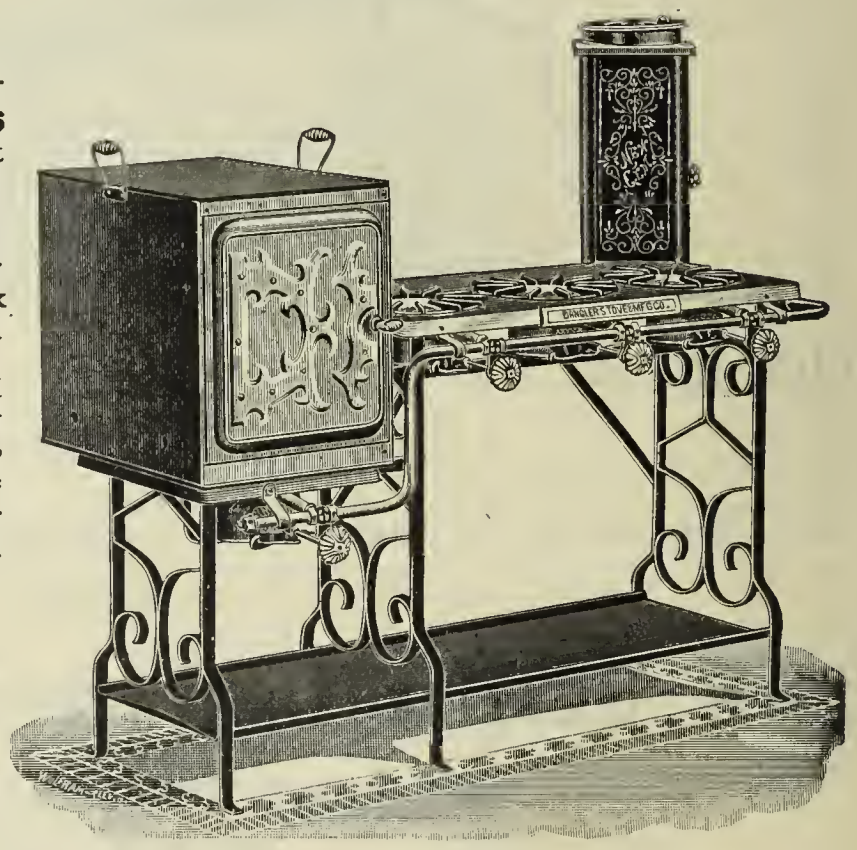
in SIZE, with the same sized flame as the PROCESS doing the same amount of work with **less fuel,** and at an original cost of only about ONE-HALF that of the regular high Stoves. This Stove is ABSOLUTELY our own, and CAN BE MADE ONLY BY US, and as pioneers in this business, the public naturally look to us for progress, while some of our competitors, who can only make the old line, call such improvements, "an innovation." Our GEM and PROCESS, together with our DELIGHT, celebrated JUNIORS, Individual and Single Generator Burner Stoves, &c., will give our trade a decided advantage over their competitors,

Write for Catalogue, 1895.

—THE—

Dangler Stove & Mfg. Co,

CLEVELAND, O.

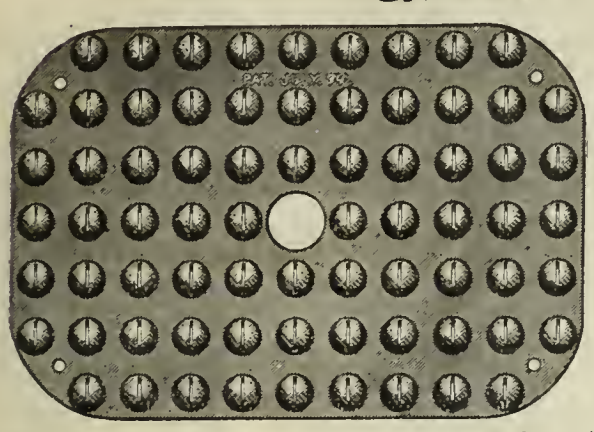


WHOLESALE AGENTS:

E. H. Huenefeld, Cincinnati, O.
Standart Bros., Detroit, Mich.
Mt. Penn Stove Works, No. 111 N. 2d St., Philadelphia.
Mt. Penn Stove Works, Reading, Pa.
Barstow Stove Co., No. 228 Water St., New York.
Barstow Stove Co., No. 56 Union St., Boston.
Home Stove Co., Indianapolis, Ind.
Denver Stove & Hdw. Co., Denver, Colo.
J. P. Lindeman & Sons, Milwaukee, Wis.
R. Robinson & Sons, Chicago, Ill.
Richards-Conover Hdw. Co., Kansas City, Mo.
The Stollberg-Clapp Co., Toledo, O.
Weber & Gebhart, Dayton, O.
Bradley & Munk, Columbus, O.
Foster-Stevens Co., Grand Rapids, Mich.
The Schaab-Puff Stove Co., St, Louis, Mo.
Dunlay & Geisler, Houston, Texas.
The Wooldridge Stove Co., Memphis, Tenn.
A. Baldwin & Co., Ltd., New Orleans, La.
M. F. Tallmage, Buffalo, N. Y.
W. E. Galbreath, S. E. cor. Lombard and Light Streets, Baltimore, Md.
The Ochsner & Orcutt Co., Sioux City, Iowa.

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*



No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

OUR JET CONE BURNERS

distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

and

SPECIAL JUNIORS.



Simplest, Safest, Best.

Exclusive Territory Given to Responsible Agents.

Correspond with us and ascertain the merits of the "Insurance" before placing your orders.

(Exclusive Mfr's.)

THE
Dayton Mfg. Co.,
Dayton, O.

HOBRECKER STOVE CO., Omaha, Neb., Western Agents.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

139, 141 and 143 CENTRE STREET, - - NEW YORK.

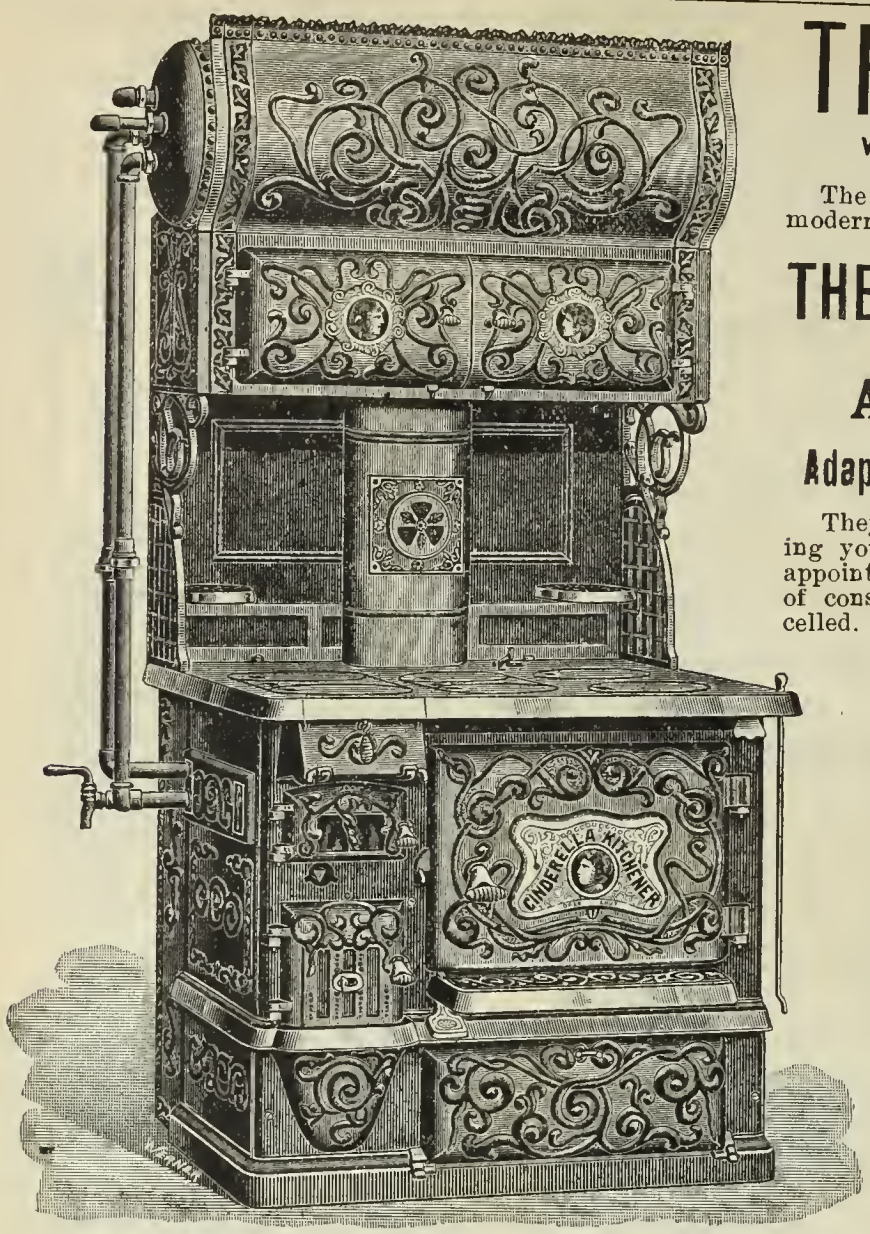
ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**



THERE IS A REASON

Why some dealers are more successful than others.

The dealer who studies the wants of his trade, adopts modern ideas, is the successful man of to-day.

THE CINDERELLA KITCHENERS

ARE AN ENTIRELY NEW LINE OF

ALL CAST IRON RANGES,

Adapted for burning Hard or Soft Coal or Wood.

They are made in a variety of styles, with a view of meeting your local requirements. They are complete in every appointment, and are "up-to-date" goods that for excellence of construction and beauty of design they cannot be excelled.

Made in the following sizes:

No. 716,	Oven 16 x 16,	10½	inches high.
718,	18 x 18,	11½	"
818,	18 x 18,	11½	"
719,	18 x 20,	12½	"
819,	18 x 20,	12½	"
821,	20 x 22,	13½	"
921,	20 x 22,	13½	"

If you are interested write for prices.

We are makers of a complete line of Stoves and Ranges under the trade-mark of

"CINDERELLA."

We would be pleased to send our catalogue upon application.

DeHAVEN & CO., Limited,

PITTSBURGH.



M & D

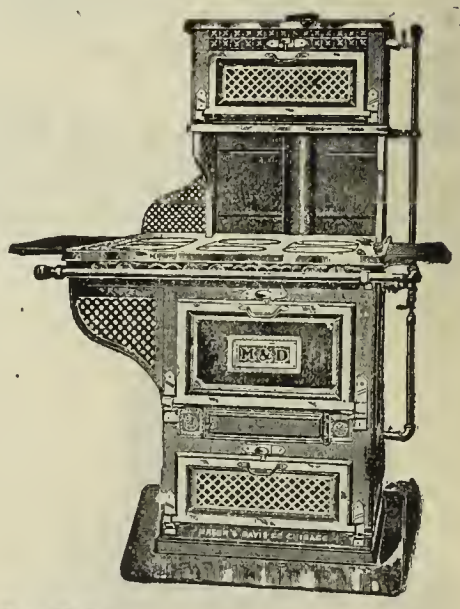
Wrought Steel Ranges

For Coal, Wood or Gas.

150 DIFFERENT STYLES AND SIZES.

M & D

Combination Range



For Coal and Gas or Wood and Gas. Single Oven and Double Oven, Gas and Coal Ranges.

SEND FOR CATALOGUE.

MASON & DAVIS CO.,

72 LAKE STREET, CHICAGO.



The Michigan Stove Company
Largest Makers of Stoves and
Ranges in the World.
Detroit, Chicago, Buffalo,
New York City.

. . . It has been said that in America TWO CLASSES of Stoves and Ranges are sold, viz.: . . .

"GARLANDS" AND OTHERS.

At the very HEAD and FRONT of the "Others" stands our new line of . . . **"MICHIGAN" Stoves and Ranges,**

Which are unquestionably the latest, handsomest and most artistically-designed Stoves and Ranges to be found upon the market at anything like the price at which they are sold.

They are made under our own supervision; by same workmen and out of the same material from which "Garlands" are made, and this fact of itself should be sufficient to cause them to be preferred by discriminating merchants and consumers, as against all other brands, excepting the invincible line of "Garlands."

Taplin, Rice & Company,

—Manufacturers.—

DICTATED BY P.

Akron, Ohio, January 29, 1895.

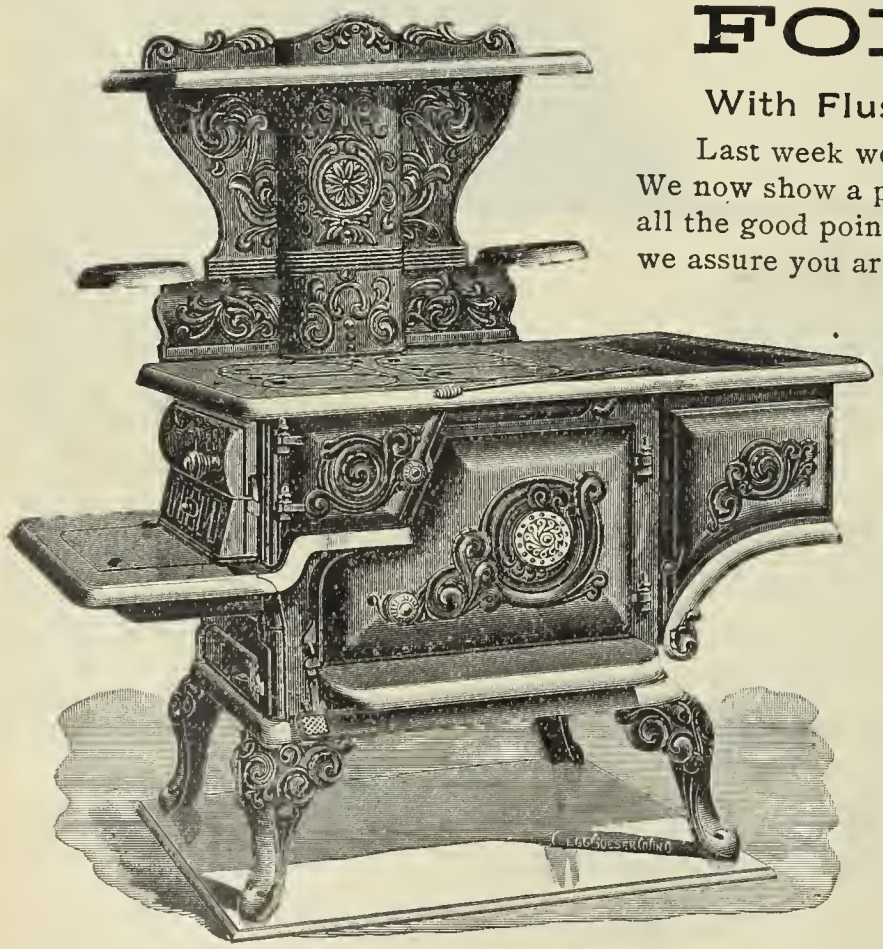
BY THIS we beg to call the attention of the trade to the fact that during the current year we will be on the market with several new patterns of Steel Ranges and Heating Stoves, of superior construction, ornamentation and attractive form, the patterns of which are well under way and will soon be ready for the sand. The Climax Steel Range, which will be made in all the various conventional forms and styles, will be both as to construction and appearance second to none on the market. We will also have ready for the trade in due time a "Climax Air Blast" and "Climax Air Tight" heating stove in different sizes, the constructive features of which will be a radical departure from any pattern of stove ever offered, and we feel well assured they will wherever introduced take a leading position in the line of special heaters. Cuts and prices of these Ranges and Stoves will be mailed on application at an early date, and we are confident you will feel justified in deferring your order for supplies until samples or cuts of stoves named may reach you.

With grateful appreciation of former courteous favors shown us by the trade, we remain,

Very respectfully,

TAPLIN, RICE & CO.

Our Queen



FOR WOOD,

With Flush Reservoir and High Shelf.

Last week we illustrated the Northern Queen, for coal. We now show a plainer finished production for wood. It has all the good points possessed by our other productions, which we assure you are many, and we do and can recommend it to all dealers as a first-class seller. If you will send for a catalogue you can learn more about stove construction and the merits of our especial productions in less time than it takes to tell it here. The cat. is free.

The Portsmouth Stove & Range Company,

Portsmouth, Ohio.

AGENTS:

R. ROBINSON & SONS, Chicago, for the Northwest.
A. L. CANFIELD, 284 Pearl Street, New York, for New England States.
C. F. HAKE & SONS, for Cincinnati and Vicinity.
HOME STOVE CO., Indianapolis, Ind.
W. E. ANTHONY & CO., Detroit, Mich.; Mich. and Minn.
BRADLEY, MUNK & CO., Columbus, Ohio.

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.



WE ARE PIONEERS in our line of Business.

Our customers get the benefit of our long experience. Our Celebrated Steam and Hot Water Heaters have stood the test of years, and they stand now where they always have stood—at the very *top* of the list!

WE DO NOT DO A RETAIL BUSINESS

American Boiler Company

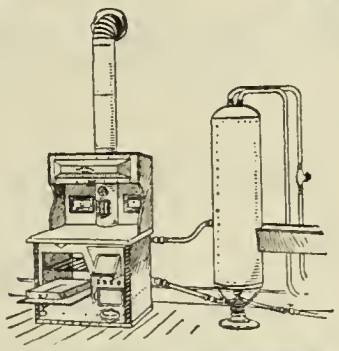
94 Centre St., New York. **84 Lake St., Chicago.**

★ STAR WATER BACK AND BOILER ★

COUPLERS.

DONT WIPE YOUR JOINTS SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

NO SOLDER NO BURST ANY MECHANIC CAN DO IT

WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

★ Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.
Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada. ★

THATCHER

The Celebrated

"Thatcher"

FURNACE and RANGES.

GAS-TIGHT.
DURABLE.
ECONOMICAL.

Also Manufacturers of the

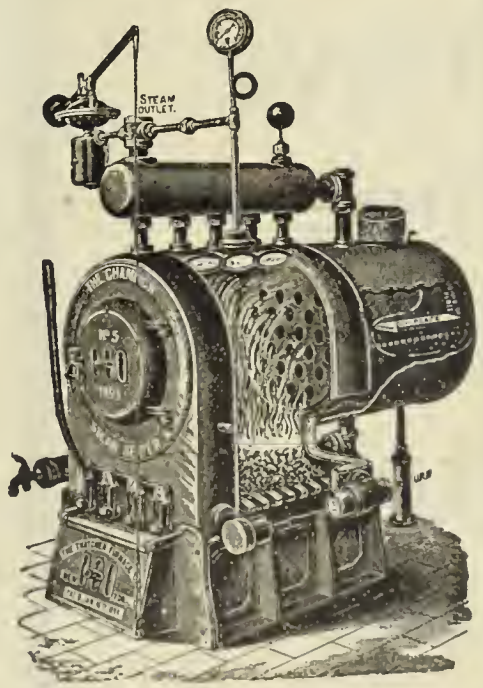
Sold by the trade extensively throughout the country.

Specified by Leading Architects.

Illustrated Catalogue Sent Free.

"CHAMPION"

Steam and Hot-Water Heaters.



Champion Steam Heater.

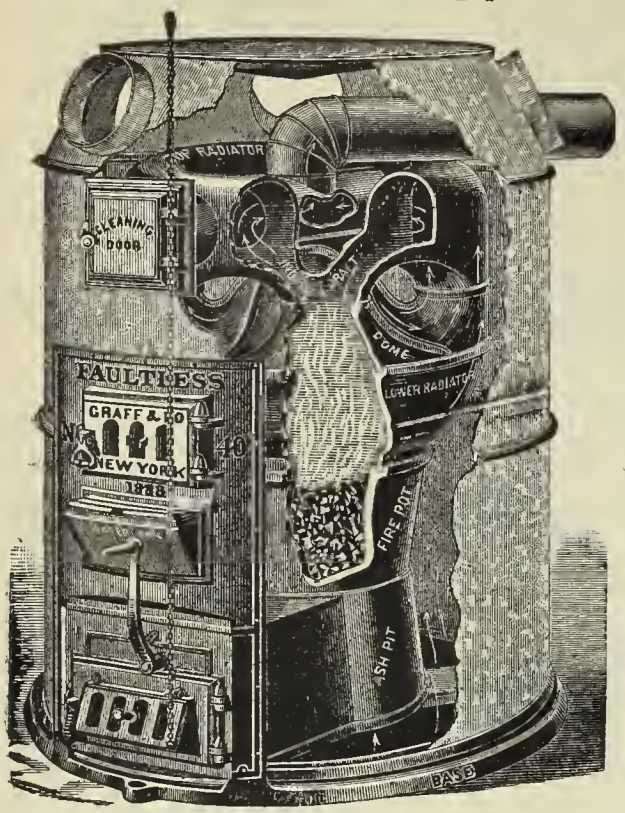
Has advantages over any other Heater.

Send for Circular.

The Thatcher Furnace Co.,

240 WATER ST., NEW YORK.

FAULTLESS.



SUPERIOR GOODS.

FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.
HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.
Faultless, Elegant and Columbian Ranges.

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.

Oppor= tunities may have been neglec= ted in the past,

but it is certainly to your interests to let us show you all about the .....

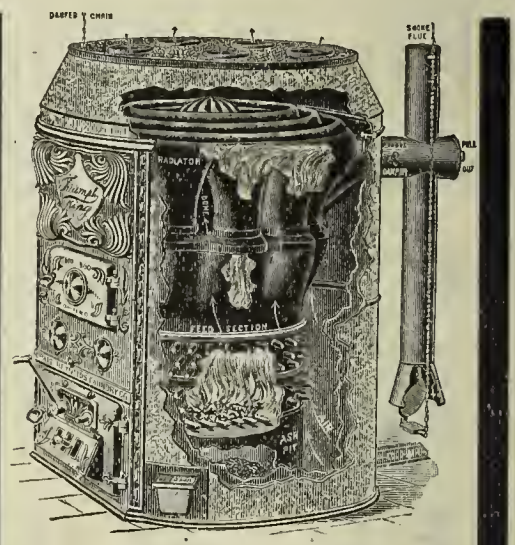
Triumph Heaters

Excellent profits and inducements. Satisfaction is guaranteed in handling

THE DEALERS' BEST LINE.

The Triumph Special,
for hard coal. 5 sizes.
The Triumph all Cast,
hard or soft coal. 5 sizes.
The Triumph King,
hard or soft coal. 4 sizes.
The Triumph Steel,
hard coal. 5 sizes.
The Triumph Air Blast,
soft coal. 5 sizes.
The Triumph Combination
for hot water and air. 5 sizes.

WESTERN BRANCH:
GEO. D. HOFFMAN, Mgr.,
82 Lake St., Chicago, Ill.

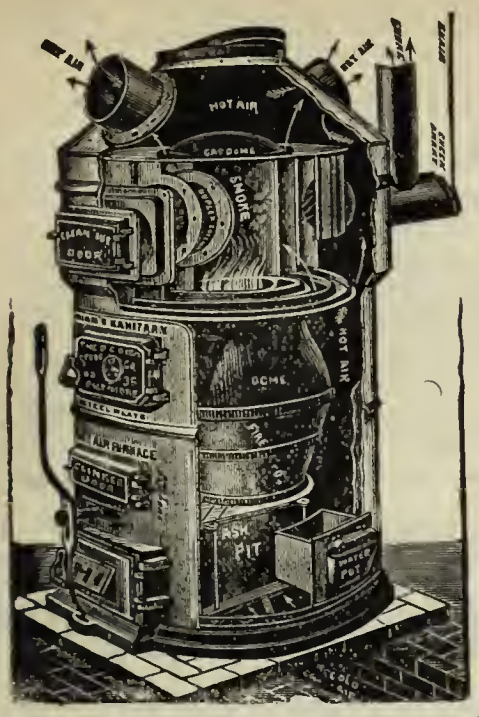


WRITE US FOR
The 1895 Catalogue of the Triumph Heaters,
OR
The Principles of Heating and Ventilation,
with Facts and Figures,
OR
The Picture Book,
OR
The Triumph Estimate Book,
all published for the use of the trade.

Prices, Discounts and full information on application to

The Craig-Reynolds F'd'y Co.,
DAYTON, OHIO.

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

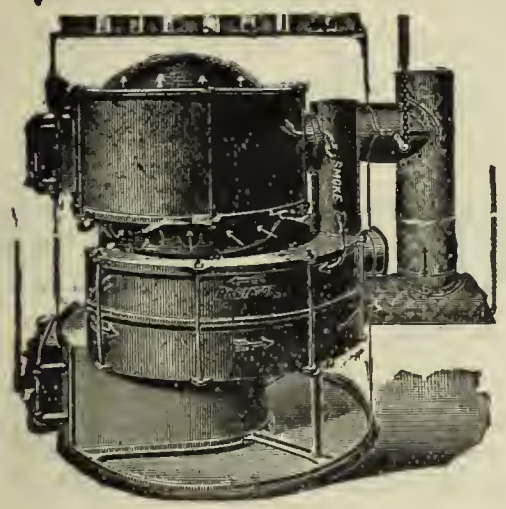
The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

Baltimore Fire Place Heaters.

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.
Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.
IT IS A GREAT ECONOMIZER OF FUEL.
IT IS A LOW FURNACE.

CORNING, N. Y., January 15th, 1895.
CORNING MFG. CO., Corning, N. Y.
Gentlemen: The Victor Furnace which you placed in my residence last fall I desire to advise you is working very satisfactorily. Of the thirteen registers we have not needed to open but five to warm the entire house at an even temperature of 70 degrees. The coldest night of the present winter I arrived home on a late train and found the house at 68 degrees, the point at which the thermostat was set, although the thermometer registered 28 degrees below zero that night. You certainly are manufacturing a very desirable Furnace.
Very truly yours,
CHAS. L. DENISON.

Agents wanted. Address
THE CORNING MANUFACTURING CO.,
Corning, N. Y.

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best
—FOR—
Steam or Hot Water Heating.

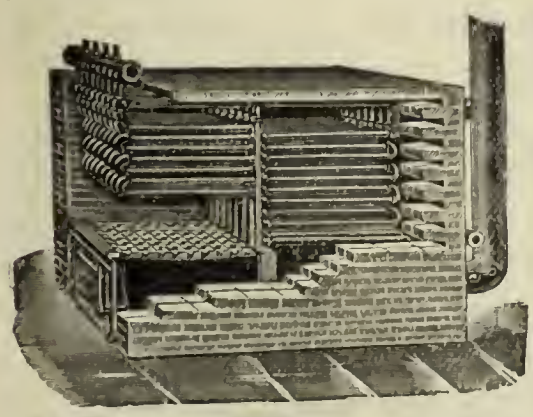
—o—

Send for Catalogue.



The Dunning Boilers

ARE MADE OF
Wrought Iron or Steel
AND HAVE NO
Packed Joints.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN
Over 300 Different Sizes.
SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST., **ROCHESTER, N. Y.**
New York Office, 44 Dey Street.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth, Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK.

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of these best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

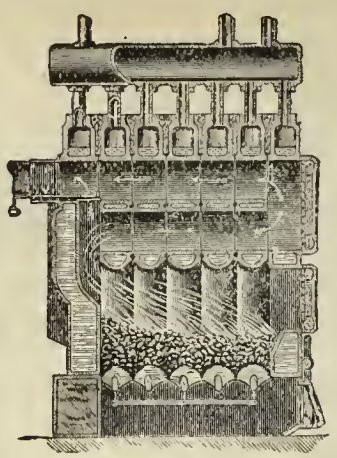
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



MERCER BOILER.

The H. B. Smith Co.,

MANUFACTURERS OF

Steam and Water

HEATING APPARATUS,

For Public Buildings and Private Residences.

SPECIALITIES:

MERCER'S Patent Improved Sectional Boiler, for Hot Water and Steam Heating, adapted for hard or soft coal.
GOLD'S Improved Sectional Boilers.
MILL'S Improved Sectional Boilers.
THE UNION Hot-Water Radiators
REED'S Improved Cast-Iron Radiators.
GOLD'S Indirect Pin Radiators, with Nipple and Flanged Joints.
BRECKENRIDGE'S Patent Automatic Air-Valves.

Office & Warerooms, 137 Centre St., New York.

FOUNDRY, WESTFIELD, MASS.

STEAM HOT WATER WARM AIR

FOR HEATING ALL CLASSES OF BUILDINGS

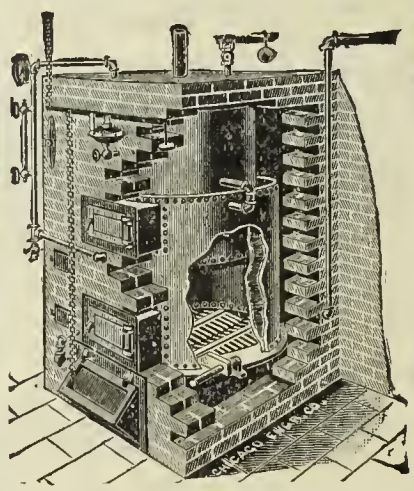
CAPITOL HEATERS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use HARD or SOFT COAL.

BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



THE MAHONY BOILERS.

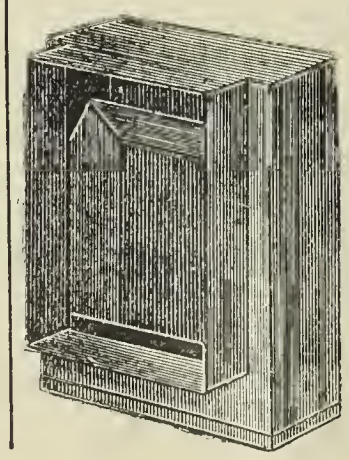
For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



Novelty Ventilated Wall Pipe,

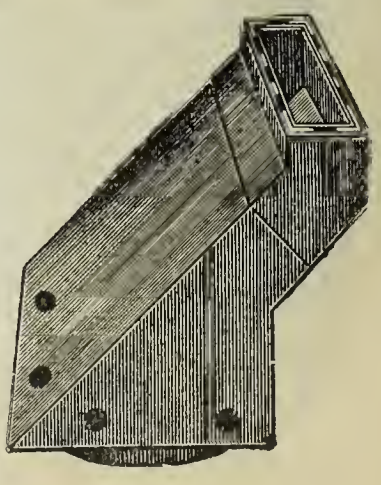
Absolutely Fire Proof.

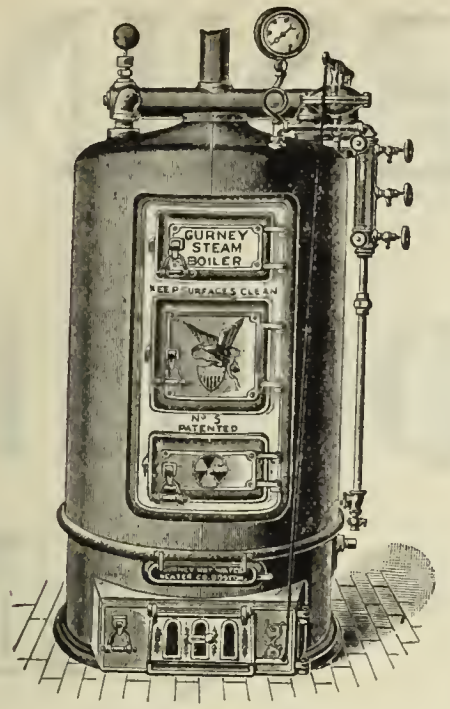
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER,

18 Wood Street, Pittsburgh, Pa.





Gurney Steam Boiler.

A GUARANTEE OF EXCELLENCE.

The Name Gurney

Used in connection with **Heating Apparatus** denotes **FINEST PRODUCTION.**

HOT WATER HEATERS, STEAM BOILERS, RADIATORS.

ALWAYS EQUAL TO THE OCCASION.

Send for Trade Catalogues.

SOLD ONLY TO THE TRADE.

GURNEY HEATER MAN'F'G CO.,
163 Franklin St., Cor. Congress,
BOSTON, MASS.
Western Selling Agents:
A. A. GRIFFING IRON CO., 34 Dearborn St., Chicago, Ill.

Don't Kick Yourself IF SOME OTHER Dealer

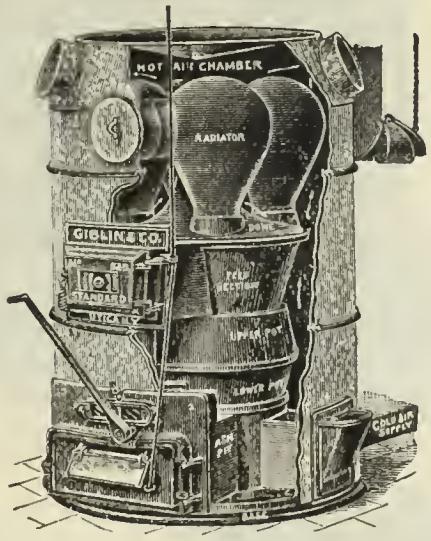
Starts in and gets your trade away from you.

"Forewarned IS Forearmed."

THE **"STANDARD"** **FURNACE**

Will be Introduced in Your Town this Season.

DO YOU WANT THE **AGENCY?**



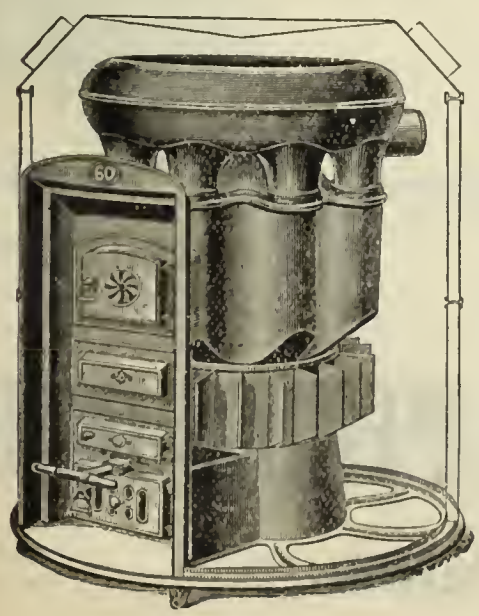
We Protect Dealers, Giving Exclusive Territory.

It is not to be supposed that men are doing ***BUSINESS*** for ***FUN,*** but to ***SATISFY*** their ***CUSTOMERS*** and ***MAKE A FAIR PROFIT.***

THIS HEATER IS A MONEY MAKER,

Doing equal justice to both Dealer and Purchaser.

GIBLIN & CO., UTICA, N. Y.

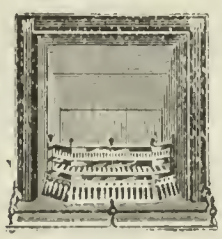


CORY'S

ALL CAST IRON GAS-TIGHT FURNACES.

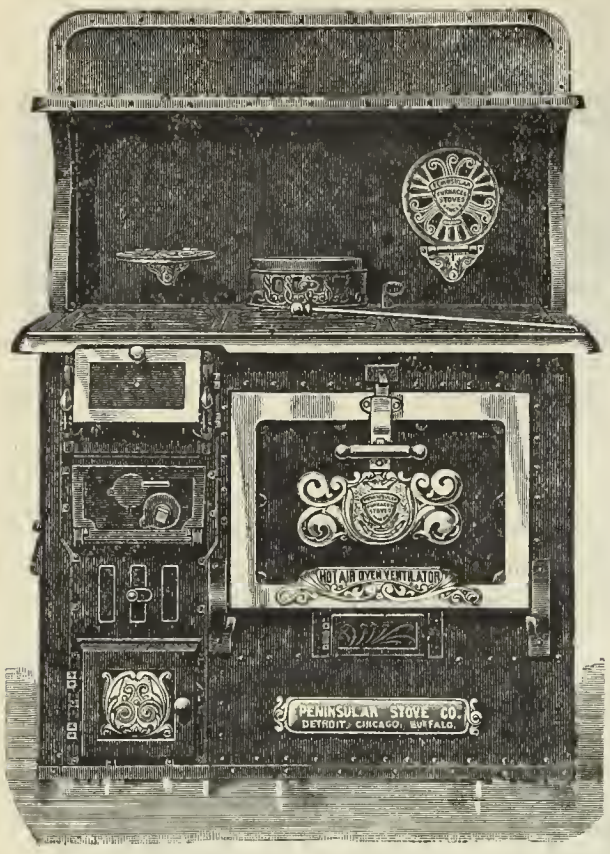
The purchaser will never ask if this is the *best* quality made, as all dealers understand the "Cory Furnace" to be only of *cast iron*, without bolted joints; gas-tight and durable. Quality exactly the same in twenty sizes from $35 to $125.

UZAL CORY & CO.,
210 Water St., New York.
Estab'lished 1847.



Established 1827.
W. Jackson's Sons,
Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.
Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.





PENIN

WROUGH

RAN

IN ALL SIZES.

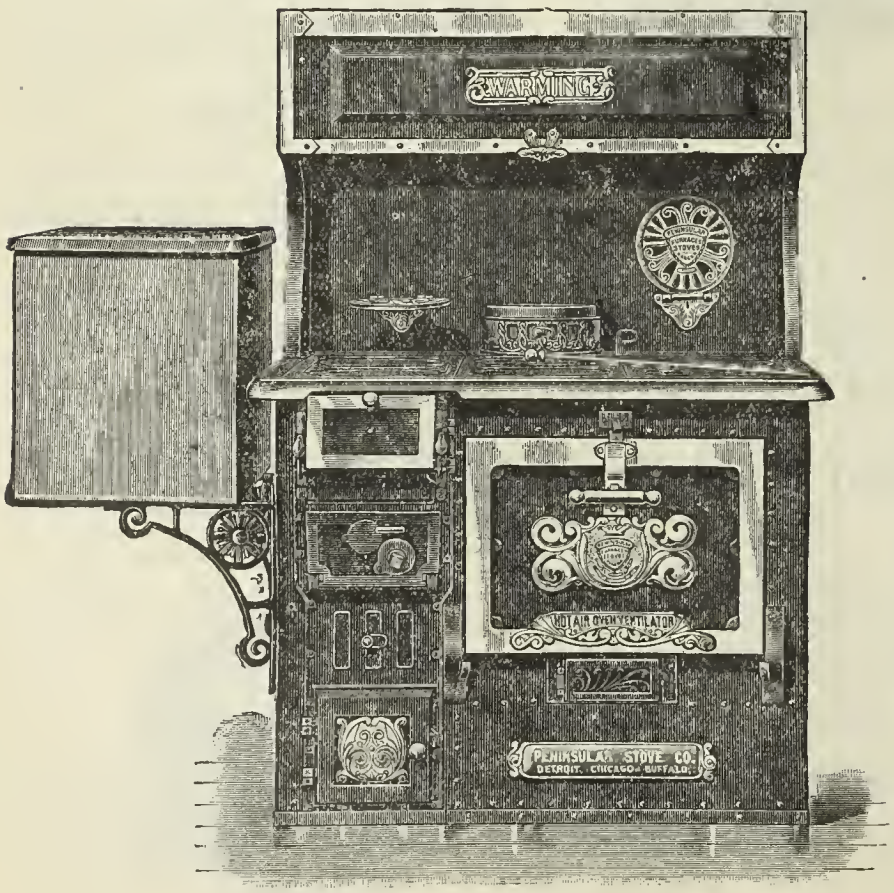
F

18





An Entirely New Line.



Write for Catalogue.

The Largest and Best Eq facturers i

THE PENINSULAR

Detroit. **Chi**

SULAR

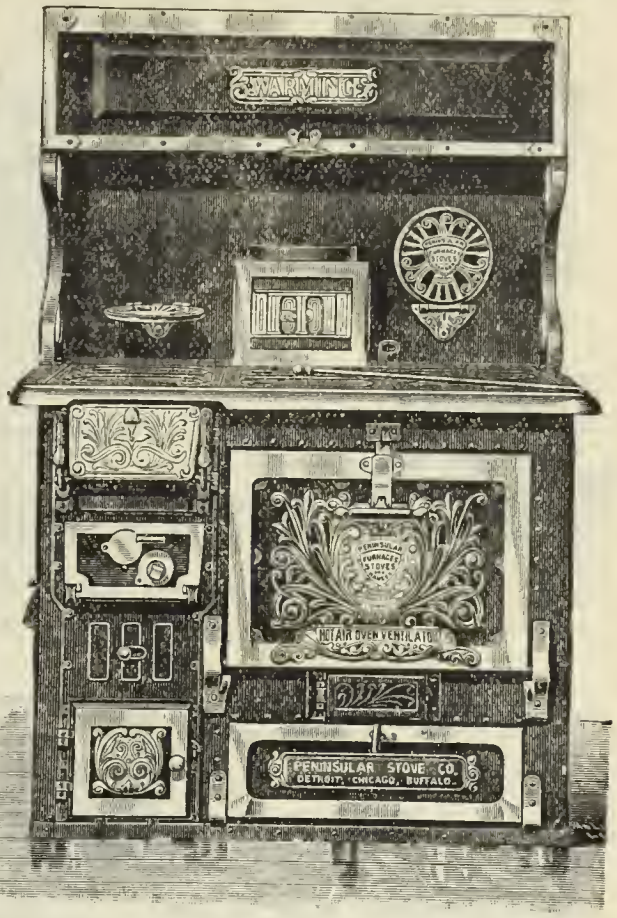
T STEEL

GES

IN EVERY STYLE.

R

95.

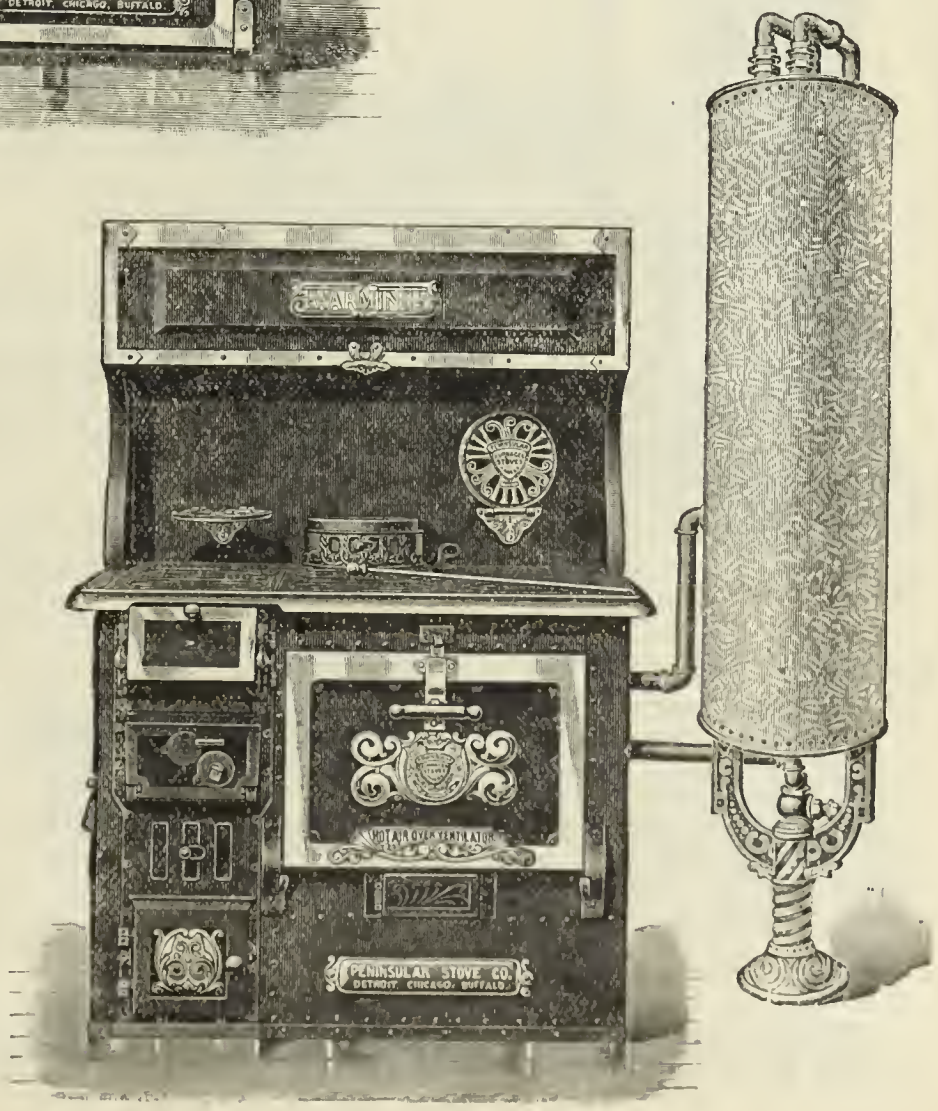






Any Combination Desired.

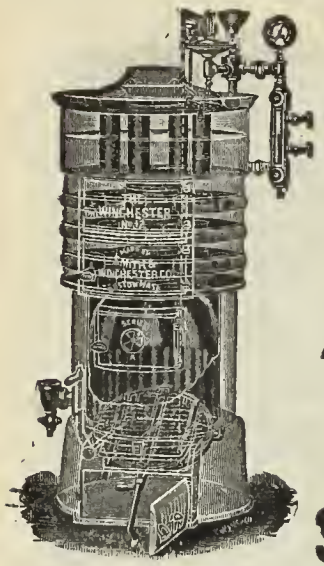
Ask for Discounts.



pped Steel Range Manu= he World.

STOVE COMPANY,

go. Buffalo.



The Winchester



Has more ***COMMENDABLE***

And less ***OBJECTIONABLE FEATURES***

Than any Heater on the Market;

——MADE BY——

SMITH & WINCHESTER CO., Boston. Mass.

Our prices on these Heaters will please you. Send for them.

LARGEST ASSORTMENT OF STYLES AND SIZES IN THE MARKET.

CORRESPONDENCE SOLICITED. CATALOGUES GIVE FULL DESCRIPTION.

SOLD ON THEIR MERITS NOT ON THEIR ANTIQUITY.

Royal HEATERS

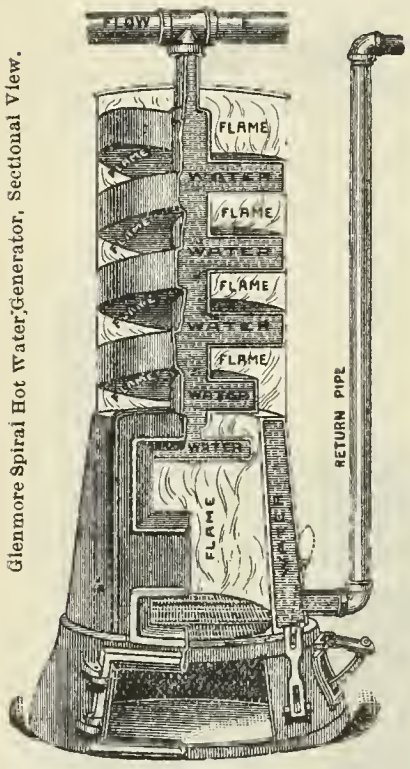
HOT WATER. STEAM. HOT AIR. COMBINATION.

MANUFACTURED BY

HART & CROUSE.

UTICA, N.Y.

NEW YORK 211 WATER ST. CHICAGO 79 LAKE ST.



Glenmore Spiral Hot Water Generator, Sectional View.

THE GLENMORE

Spiral Hot Water Generator.

(PATENTED.)

For General Heating Purposes, but Especially Adapted to House Heating.

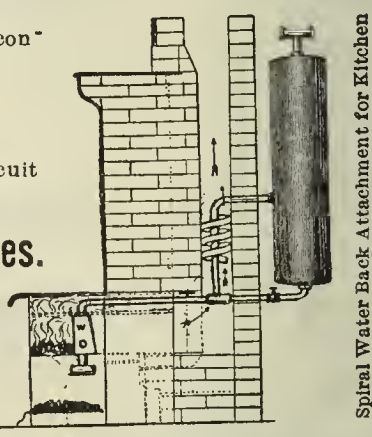
COMMENDATORY POINTS:

Simple construction. Practically composed of two sections, consequently few joints and nothing to give out.
Large heating surfaces.
Products of combustion fully utilized.
Instantaneous generation of hot water.
Free and easy circulation.
Easily cleaned fire surfaces.
Hot water may be drawn off at any point along the pipe circuit without materially affecting the heating service.
Grate conducive to economy in fuel.

Spiral Water Back Attachment for Kitchen Ranges.

By utilizing waste heat, this water back extends the capacity of a kitchen boiler, and makes it a valuable heating auxiliary, especially in spring and fall, when the regular heating apparatus is too powerful.

☞Send for Pamphlet.



Spiral Water Back Attachment for Kitchen Ranges.

GLENMORE FOUNDRY AND MACHINE CO., 73d ST. and WOODLAND AVE., PHILADELPHIA, PA.

SECURE AGENCY EARLY.

Send for Catalogue without delay.

The Plummer Steam Heater.

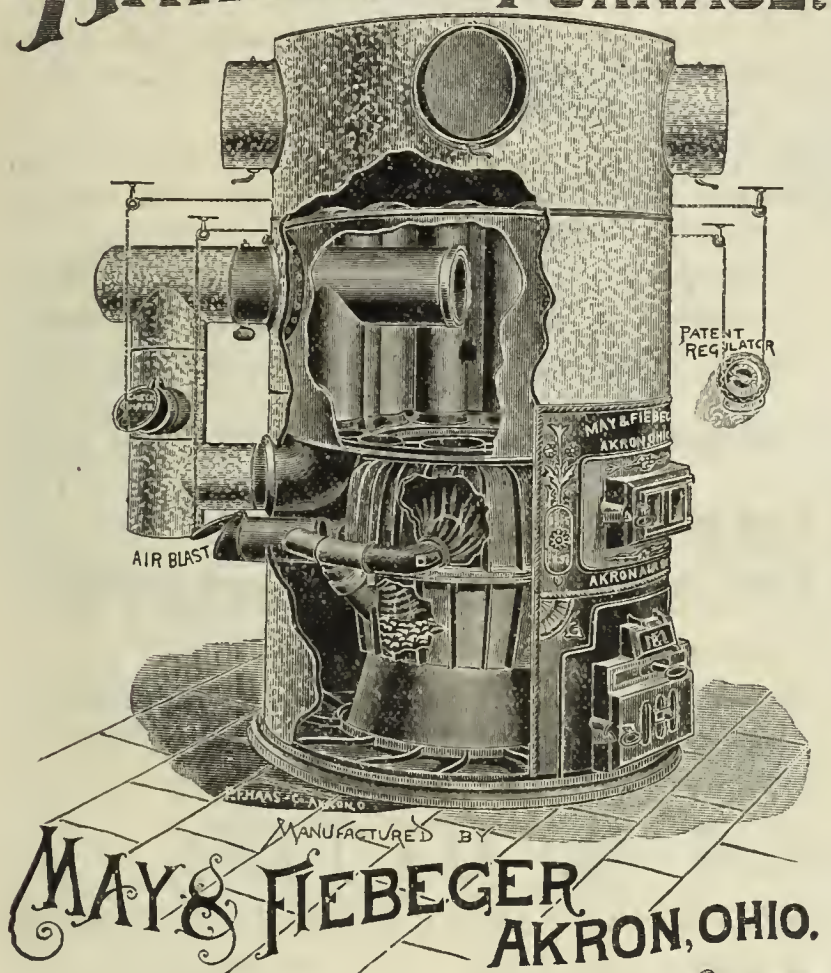
12th SEASON, BUT "UP TO DATE."

The Leader Hot Water Heater.

PUTNAM FOUNDRY & MACHINE CORPORATION, - PUTNAM, CONN.

"JUST AS GOOD AS THE AKRON 'AIR BLAST' FURNACE,"

AKRON AIR BLAST FURNACE.



Has become a familiar expression with the stove trade in many States.

Don't you want to make your competitors use it? Why it is so commonly used, is a Think to thought about.

WE ARE IN IT.

The past extremely cold weather has clearly demonstrated that.

THE ORIGINAL AKRON AIR BLAST FURNACE and its many agents are strictly in the swim. There is no weather too cold for us.

After twenty-five years' experience with the best furnaces made our Mr. May was convinced by careful experimenting and studying that they were not built on scientific principles, and therefore he invented and six years ago perfected the "Air Blast" principle for burning coal, which he has applied to the Akron Air Blast Furnace, and it has been so successful in burning all kinds of fuel, especially soft coal, that it has completely revolutionized the furnace business, and all manufacturers of the best furnaces are now trying to imitate it. The Akron Air Blast Furnace is the original and leader. Others follow.

THOUSANDS of users are glad to testify to its merits and its economy.

HUNDREDS of dealers are happy with its success.

DOZENS of imitators are wondering how it took its place at the front in so short a space of time.

ONE special dealer we are desirous of informing as to why the Akron Air Blast Furnace has such a wonderful record. You we mean. Write us.

Build up your trade with a certainty. No need of making furnace work a hit and miss.

Can you equal the following record with the furnace you are selling?

We have hundreds of agents in Ohio, Indiana, Illinois, Iowa and other States whose experience is equal to this. Carload and duplicate orders from them prove that their trade is increasing.

76 Furnaces Sold

AND NOT ONE COMPLAINT.

THE

Akron "Air Blast" Furnace

Has proven a Record Breaker. Even in hard times our agents have been busy. You should secure agency at once and be in the race at the front.

READ THE FOLLOWING LETTER:

OFFICE OF
WELCH & HORTON,

NEW CASTLE, Pa., March 28, 1894.

Messrs. May & Fiebeger, Akron, Ohio.

GENTLEMEN: We took the agency of the Akron Air Blast Furnace late in the season of 1891, and have sold up to the present time 76 Furnaces, and have not had a complaint from a single furnace, which we consider is the best recommendation the furnace can have. Our furnace trade has been affected less by the hard times than any other line of goods we handle, which shows that people always find the means with which to buy a good article.

The Akron Air Blast Furnace has established a reputation for itself through Lawrence County that other furnaces cannot overcome, and when they make a sale it is to parties who look at price and not the furnace. We know that we have the best furnace on the market to-day and our customers know it, too. Wishing you success for 1894, we remain, Yours respectfully.

WELCH & HORTON.

Welch & Horton's Sales Have Been:

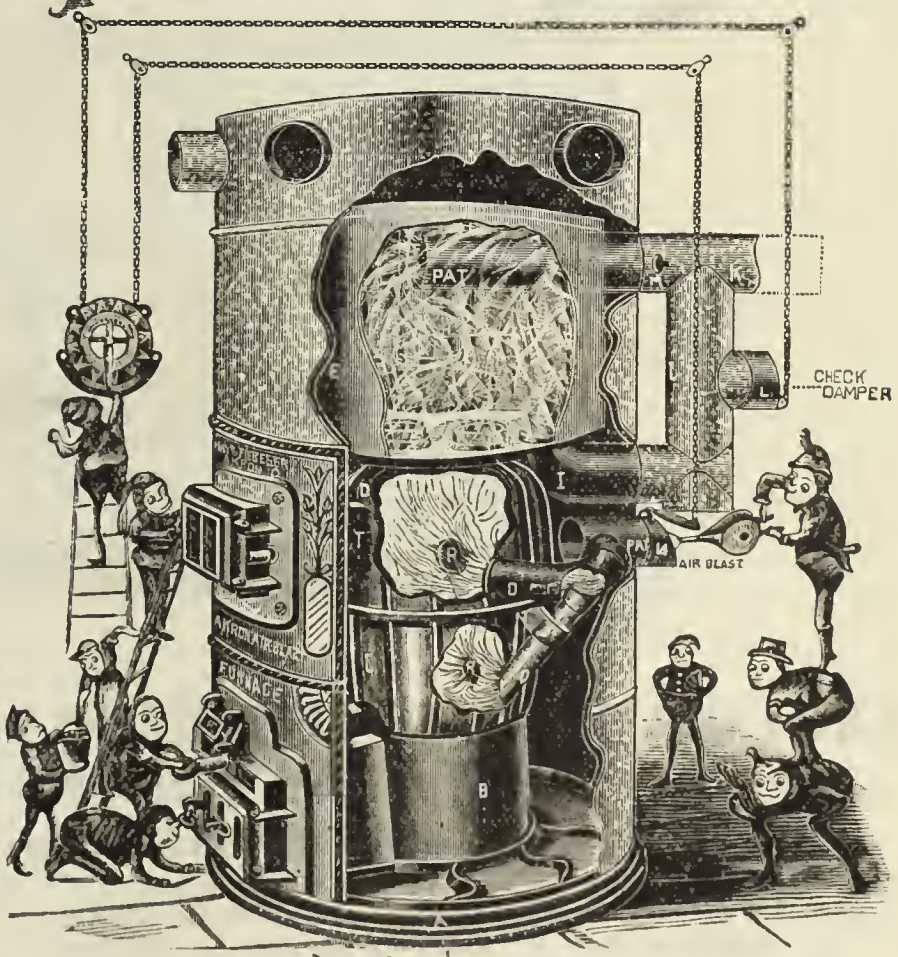
8	Akron Air Blast Furnaces	in	1891	
30	"	"	1892	
38	"	"	1893	
34	"	"	1894	M. & F

Write for Catalogue Secure the Agency before some live competitor of yours gets it.

MAY & FIEBEGER, Mfrs.,

Akron, Ohio.

AKRON AIR BLAST FURNACE.



1895. SAM S. UTTER,



Sam S. Utter's
50th year in the
STOVE BUSINESS
and
STILL GROWING.

113 Beekman Street, New York,

Offers the best line of Lamp Stoves in three grades. Also the most **POPULAR** and best sellers in the market, such as the

GAME in four sizes; 1, 2, 3 and 4 Burners, with Tank in one piece. Sam S. Utter's Patent Wick Tube of BRASS, in one piece. An extra first-class stove in every way.

SUMMER GIRL, in three sizes; 1, 2 and 3 Burners, with Tank in one piece and Chilled Iron wick tube. The next best to the **GAME,** but superior to any other.

SOLO	DUET,	TRIO,	QUARTETTE,
1 Burner.	2 Burners	3 Burners.	Two Duets and frame.

With Tin wick tubes. Cheaper and better than any other low priced Lamp Stove.

GAME GAS STOVES, with flat tops; two styles, in 1, 2 and 3 Burners.

NEW GAME OIL STOVE.

PARLOR GAME OIL HEATER.

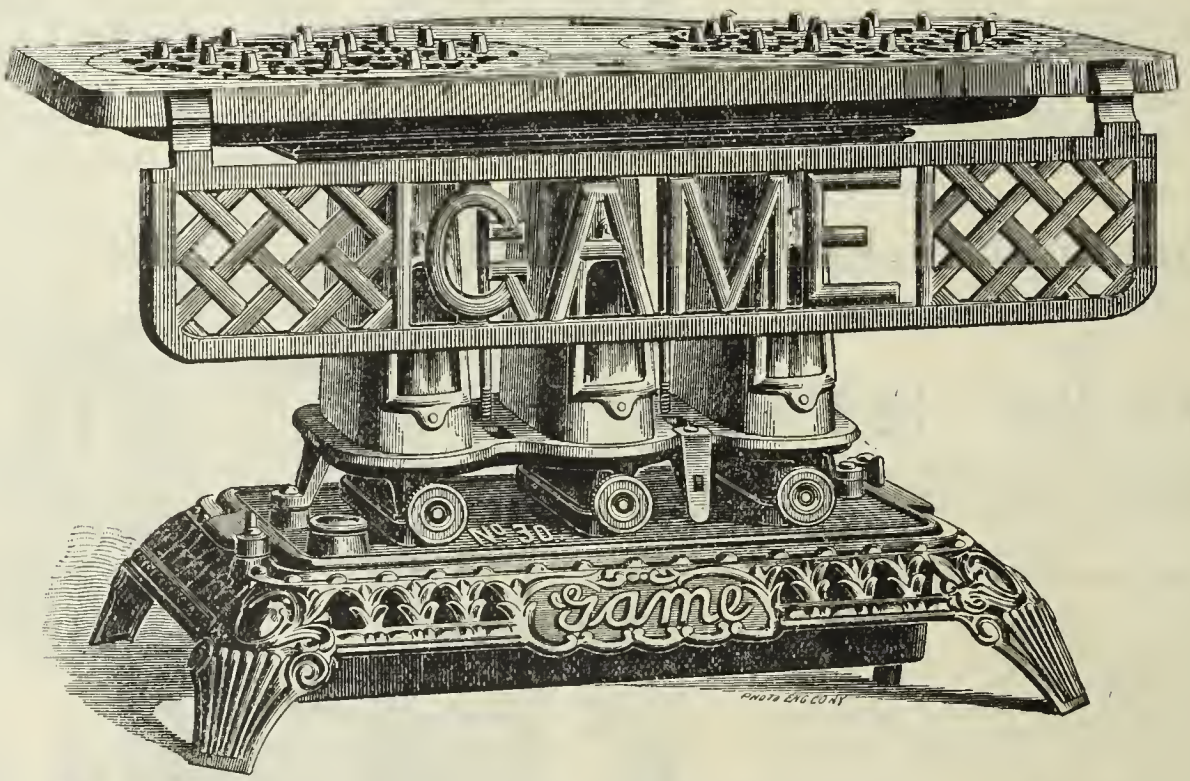
A grand success. A prize **Parlor Heater.**

SAM S. UTTER'S Patent Tops and Bases for Lamp Stoves.

LARGE BUYERS and JOBBERS will find it to their advantage to send for prices and secure territory. Address

SAM S. UTTER,

113 Beekman Street, - - NEW YORK.
79 North Street, - - - Boston.



GAME LAMP STOVE IN FULL DRESS with Sam S. Utter's patent Top and Shelf and Base.

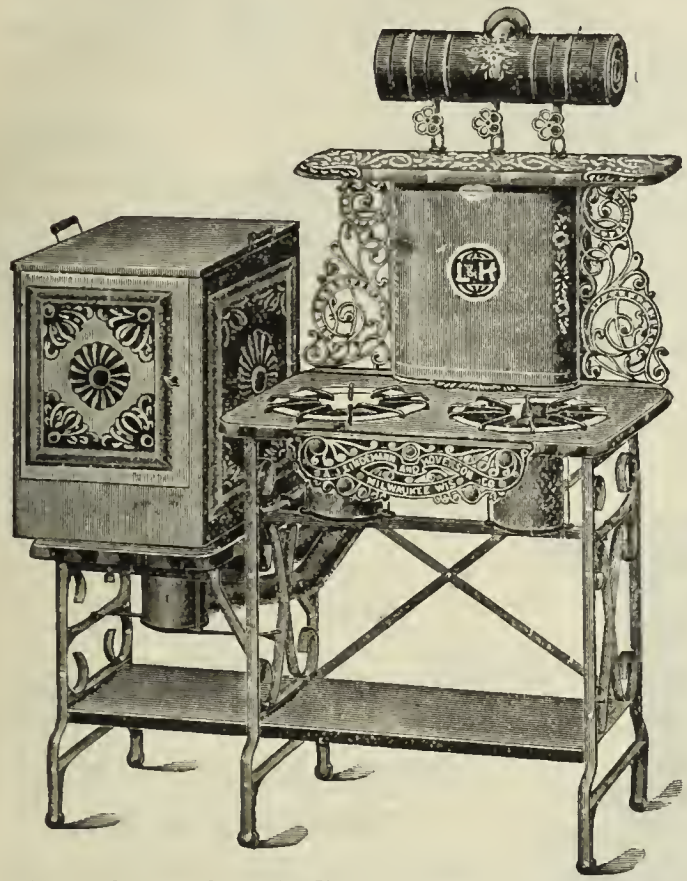
ALL MY LINE FOR SALE AT MY PRICES BY

JACOB RETTERER, for Chicago, and West and Northwest.
BURTIS & CO., in Troy, for New York State and Western New England.
F. M. BORDEN & BRO, in Philadelphia, for Phila., and as far East, West, North and South as their trade extends.
C. B. BAKER, in Cleveland, O, for Ohio and Indiana.
CRIBBEN, SEXTON & CO., Denver, Colo., for Colorado and surrounding States.
O. K. STOVE & RANGE CO., Louisville, Ky.
H. C. WHITTEN, 79 North St., Boston.

L. & H. STOVES

FOR

GAS, GASOLINE and KEROSENE.



This, our L. & H. Process, stands unexcelled, as the many customers using it daily will verify. If you use it you will also like it.

Very durable and does not smell when extinguished. It is made under the Kitson and Lindemann patents. The finest Stove made.

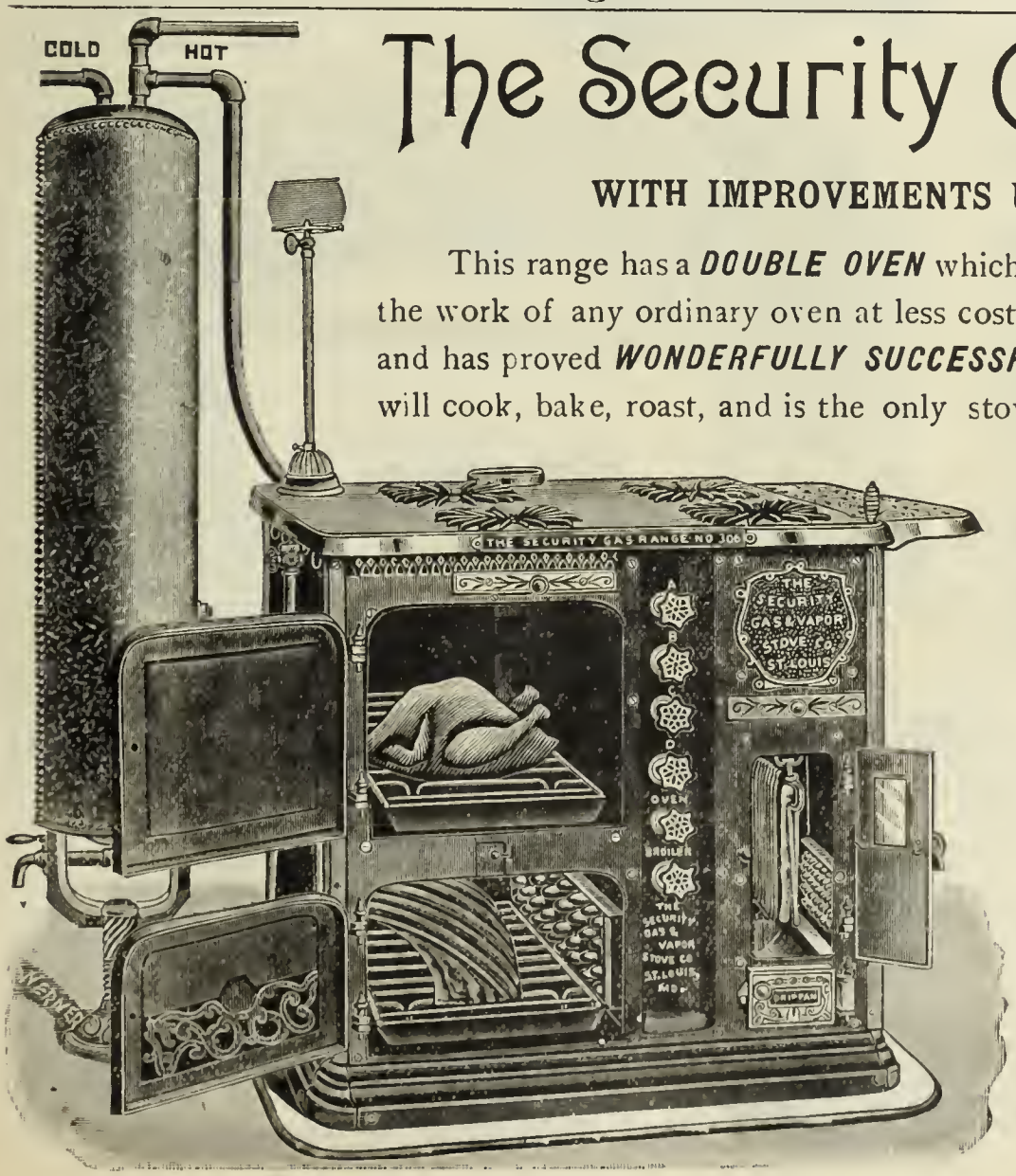
Send for new catalogue. It contains the largest assortment of Stoves, Ranges, Ovens, &c., for gas, gasoline and kerosene.

A. J. LINDEMANN & HOVERSON CO.,

Branch House, Chicago, Ill. MILWAUKEE, WIS.

The Security Gas Range

WITH IMPROVEMENTS UP TO DATE.



This range has a ***DOUBLE OVEN*** which is guaranteed to ***DO DOUBLE*** the work of any ordinary oven at less cost. It is made for family use and has proved ***WONDERFULLY SUCCESSFUL*** wherever introduced. It will cook, bake, roast, and is the only stove which will ***BARBECUE A STEAK, AND WILL ALSO HEAT WATER QUICKER THAN ANY OTHER GAS STOVE ON THE MARKET.*** It is strongly built, neatly and tastily decorated and will prove ornamental as well as useful.

Write early and secure the Agency.

L. B. JONES,

ST. LOUIS, MO.,

Successor to

SECURITY GAS AND VAPOR STOVE CO.

How Ancient Pottery Was Made.

What served people in any line of work before patents? The answer, says O. T. Mason, in the *Inventive Age*, is easy, and not to be questioned. It was manual dexterity and bodily knack. I have been looking up the potter's wheel lately and find that prehistoric pottery as well as that of the uncivilized was made without a wheel. But they all get around the work in making it, and produce results of marvelous symmetry. The New Caledonians are Oceanic negroes, and produce superior ware. The potter uses a common water worn pebble as his wheel. Upon the flatter side he sticks a dab of clay, and around this he winds a coil of clay, widening as he goes, and smooths the work with his fingers and a flat stone. The under side of the pebble presents at its apex a small surface to the hard ground, and turns or pivots with ease. This is a natural potter's wheel on which the workman turns his vessel as he builds it up.

The Nicobar islander gets at the thing in another way. The operator, seated on the ground, places before her a board on which is laid a ring or hoop of cocoanut leaves closely woven. Upon this a shallow dish is set lined with a circular piece of plantain leaf that will stick to clay and slip in the dish. A lump of clay pressed on this leaf is the bottom of the vessel, which is afterward built up by the coiling method. The board, the smooth ring, the leaf in the dish constitute the potter's wheel.

Our own Southwestern Indian women work on the bottom of an old pot or basket, or inside of the same. They begin the coil sometimes at first, at other times a starting lump is used, but the old pot or basket is easily turned. The woman at times even walks around her work, a genuine case of getting there though one has to adopt the method of Mohammed.

— GOT AN UNDER BERTH.—One of the heaviest members of the House is also one of the shrewdest statesmen in Washington, and he seldom has to take an upper berth in a sleeping car. When once he discovered that he had drawn an upper berth in a Pullman he wanted to know whether the car was new and in good repair.

"The reason I want to know," he said, in a loud voice, "is because I had a rough experience last night and night before on one of your cars. They put me in an upper berth and both times it gave way in the middle of the night and let me down on the man underneath. I've got an upper berth this trip, and I don't care to have the thing happen again. You see, I'm a little heavier than the ordinary run, and it's no joke."

The other passengers began to prick up their ears and look around. A half dozen of them asked the fat gentleman what the number of his berth might be, and on his announcing it the timid occupant of the berth underneath proposed, with a great show of courtesy, that it would be a good thing to swap, and the exchange was made with glee on both sides.—*Exchange.*

— CONVINCED.—"You aver," said the black browed bandit, "that you are the celebrated cantatrice Mme. Squalkina. Prove it and you are free. Never shall it be said that a Cuttaweezanda would offer indignity to an opera soprano. It is against all tenets of the profession."

"How shall I prove my identity?" asked the captive.

"By singing, of course."

"What? Sing in this cave? No bouquets? No steam heat? And not a cent in the box office? Never!"

"Gentlemen," said the bandit, "it is evident that the lady is what she claims to be. Escort her to the nearest village and set her free."—*Indianapolis Journal.*



The Merrill Heater.

The Simplest, Most Attractive and Best Lamp Heater yet Offered to the Trade.

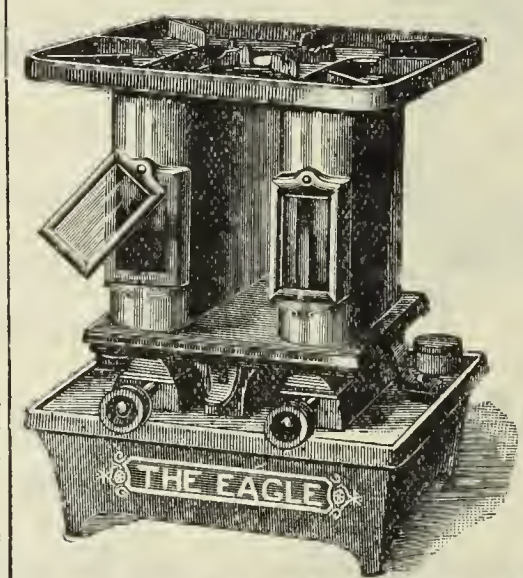
The top half is made of Aluminum, a metal that will not tarnish or discolor from heat, is light, durable and without a rival as a radiator; the under half is corrugated, heavily nickeled brass, which serves as a reflector, increasing, instead of impairing the light. No smoke—no odor—no broken chimneys

On a central draft lamp, it heats small rooms, takes the chill off larger ones, boils a pint of water in five minutes; in fact, it is a Model Emergency Stove. Thousands of New Englanders will testify to all we claim for it.

It is a seller. Liberal terms to dealers. Order through your jobber or the

ALUMINUM HEATER CO.,

110-112 BOYLSTON STREET, - - - BOSTON.



GRINBERG BROTHERS,

MANUFACTURERS OF THE

EAGLE BRAND

Gas and Oil Stoves,

STIFF and ADJUSTABLE SHEET METAL

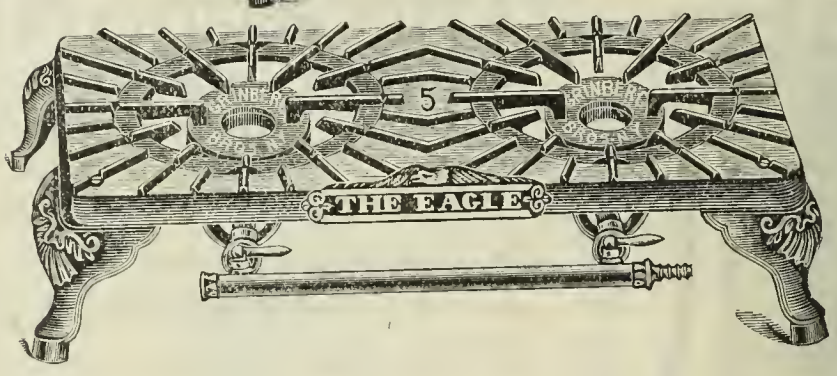
ELBOWS,

Stove Pipes, House Leaders, Hot Air Pipes, etc.

STOVE PIPES NESTED FOR SHIPPING.

154 and 155 SOUTH STREET,

Near Peck Slip, *NEW YORK.*

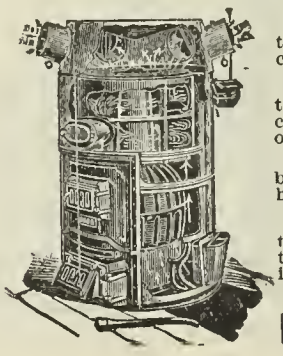


ORIGINAL

"BEAUTY OIL STOVES."

Central Draft, Double Roller Burners.

TROY OIL STOVE CO., - - Troy, N. Y.



WHY IS IT

that the same dealers who sold the **Boomer Furnace** five years ago are still continuing its sale?

DID YOU EVER STOP TO THINK

that one or two years' experience with a poorly constructed light furnace always creates a demand for a furnace that has proven to be the best in the full sense of the word?

IF YOU WANT TO MAKE MONEY

buy the Improved Boomer Furnace, set it up right, please your customer, and you have the key to your future success.

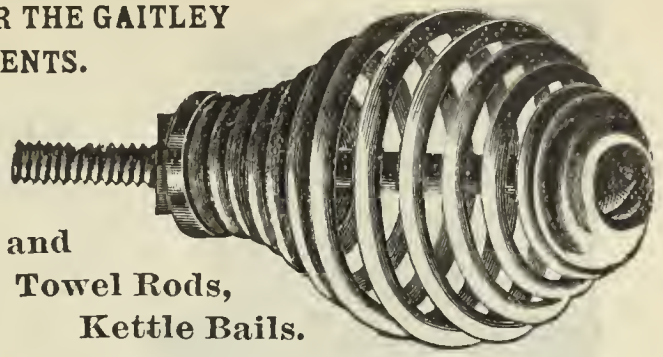
REMEMBER

that a Boomer Fire Pot has never been known to crack or burn out. That it has the simplest and most effective Gas and Smoke Burner. Guaranteed the heaviest Furnace made. 84-page catalogue sent free to all responsible dealers.

HESS, SNYDER & CO., MAKERS. Massillon, Ohio.

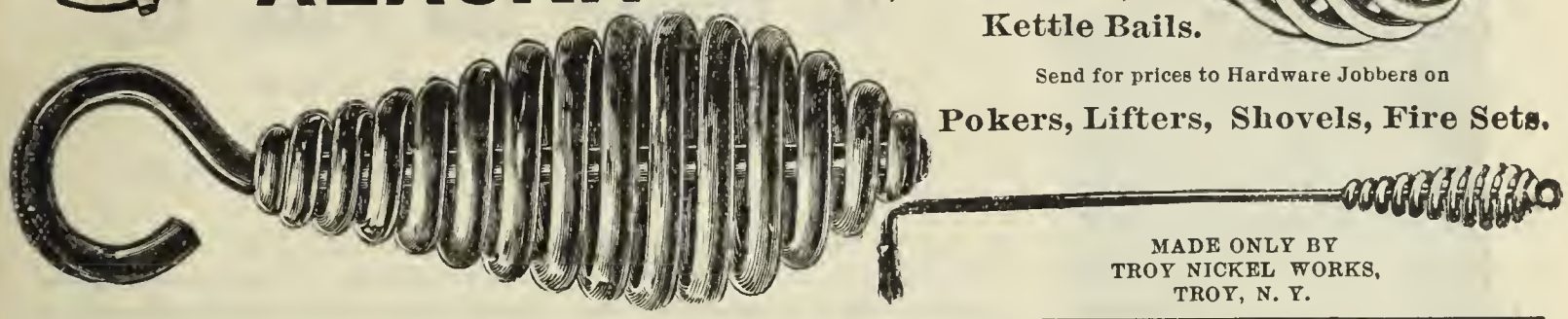


MADE UNDER THE GAITLEY PATENTS.



ALASKA

Stove Knobs and Handles, Towel Rods, Kettle Bails.



Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.

MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

THAT'S WHAT THEY SAID——

"Cold snap? We hadn't noticed it particularly—kept warm enough at our ho se"

THEY WERE USERS OF THE

"Mowry-Page" Boiler,

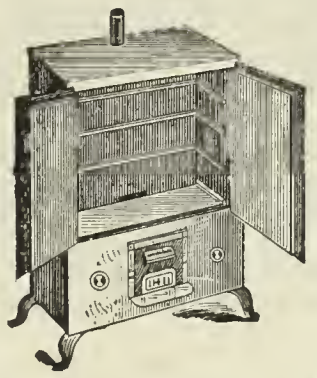
This well satisfied lot of people. Many fitters were fortunate enough to have them among their customers—were YOU? Our new agency list is open for '95-'96: shall we put your name at the head of it? Experience must have shown you that it pays to please your trade, and we can help you do it.

Better have our catalogue by you anyway—it's a good investment and costs you nothing.

W. C. MOWRY, Lock Box 314, Norwich, Ct.

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.
Burlington, Vt.

THE VOLUNTEER

STEAM



For hot water or steam has no superior, and is the only hot water boiler that is SELF REGULATING.

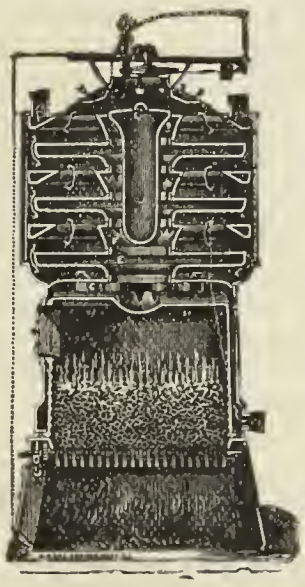
Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

New York Agents, Dubois & Darrow, 61 Gold Street.

SECTIONAL VIEW, Hot Water.



MICA

NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE

THE BEST IN THE WORLD!

OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

At LOWEST PRICES EVER KNOWN.

If your dealer does not have them, Send for Illustrated Circular and Price-List, to

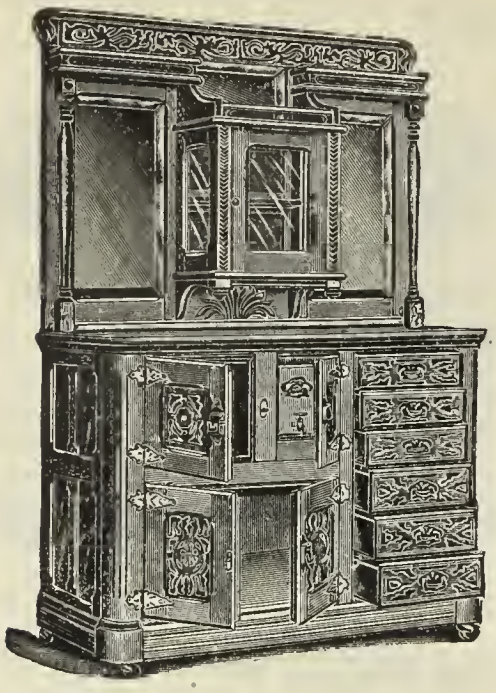
JOS. W. WAYNE,
MANUFACTURER,
124 MAIN STREET, CINCINNATI, O.

MICA

MICA OF ALL GRADES
—FOR—
STOVES and Mechanical Purposes.
PALERMO MICA CO.,
Miners and Importers and Wholesale Dealers,
S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.

NEW HAMPSHIRE
MICA
IS THE BEST.

The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.



GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co., Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.
Lee-Clarke-Andreesen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Wm. Miller Range & Furnace Co., Cincinnati, O.
Doggett Dry Goods Co., Kansas City, Mo.

BUY THE BEST.

—THE—

Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,

GRAND HAVEN, MICH., U. S. A.

Write for our large Illustrated Catalogue for 1895.

All our goods are made of thoroughly kiln dried ash, finished in antique with Shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups All Refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

THE CHALLENGE ICEBERG,

THE ∴ HONEST ∴ RELIABLE ∴ REFRIGERATORS,

SELL THE BEST.



No. 21.

The Gurney Patent Refrigerator

is the BEST SELLER, gives the BEST SATISFACTION and PROFIT to the dealer of any refrigerator on the market. BECAUSE—It has special FEATURES, "TALKING POINTS," SELLING POINTS, not found in other refrigerators.

1. By the use of a ***Removable Galvanized Ice Compartment*** the ***"Gurney"*** can be cleaned. This feature alone assures its sale.

2. Under the ***"Gurney"*** principles of construction the ***lowest*** average temperature is reached with the ***greatest economy of ice,*** as fully explained in our catalogue.

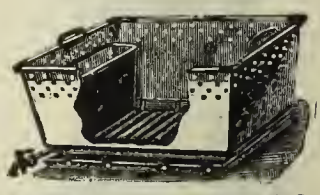
3. In the ***"Gurney"*** the ice does not come in contact with the zinc side walls, thus preventing condensation or "sweating" on the inside linings, an important feature of cleanliness and durability.

4. It is packed with Mineral Wool (the best non-conductor known).

5. It has the freest circulation and dryest air, there being a large space around the four side walls of the ice compartment, thus giving about six times the condensing surface of any refrigerator.

6. In style and finish it leads all competitors.

Send for Illustrated Catalogue and secure Agency.

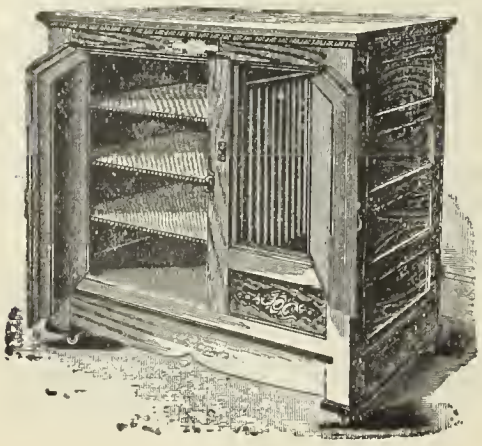


Removable Galvanized Ice Compartment.

GURNEY REFRIGERATOR CO., Fond du Lac, Wis.

The Automatic Refrigerator

has more good points and does better work than any other and for that reason is a better seller. Our illustrated catalogue for 1895 te ls all about the line. Its advantages are:



Perfect circulation.
Large condensing and purifying capacity.
It has no flues to cause it to smell bad.
The trap is inside where it cannot he misplaced or lost.
The drip pipe may he cleaned without disturbing anything in either chamber, and is entirely out of the way
it has nine walls to protect the ice aud to maintain a uniform temperature in the cooling chamber.
It has woven wire provision sheives that are superior.
It has superior hardware.
It is more capacious and convenient.
Flavors of foods will not mix.
Last hut not least, it's different, and will hring new customers and new trade.

We want the leading dealers to sell our goods and but one dealer in a place.
The goods are made of ash, and well finished.
We have two factories, one in the East and one in the West, and are able to take better care of your trade than if we had but one.
For catalogue and discount address:

Illinois Refrigerator Co.,
909 Masonic Temple,
Chicago.
If West of Chicago.

Columbia Refrigerator Co.,
Northville,
Wayne Co., Mich.
If East of Chicago.

BLUE BOOK
FOR THE
REGISTER TRADE.

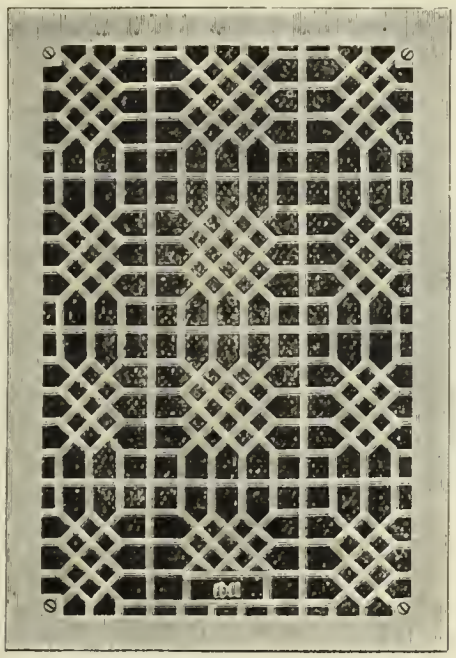
A UNIQUE PUBLICATION FOR
FREE DISTRIBUTION.

IF INTERESTED IN WARM AIR REGISTERS,
PLEASE WRITE FOR COPY TO

The Ferrosteel Company,
Wade Building,
Cleveland, - Ohio.

TUTTLE & BAILEY MFG. CO.,

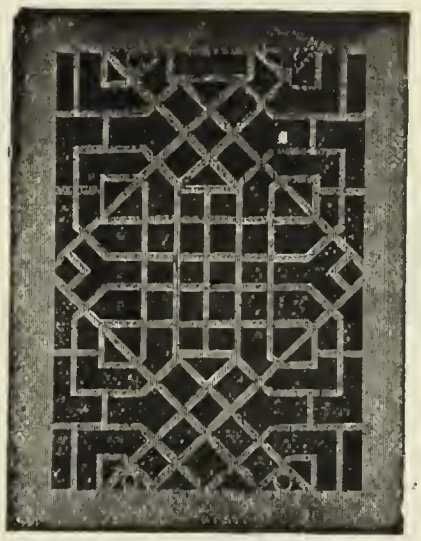
REGISTERS, VENTILATORS, &c.



INDIAN LATTICE DESIGN.

REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.



Warm-Air Registers, Ventilators Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.

WM. HIGHTON & SONS,
MANUFACTURERS
Registers, Ventilators.

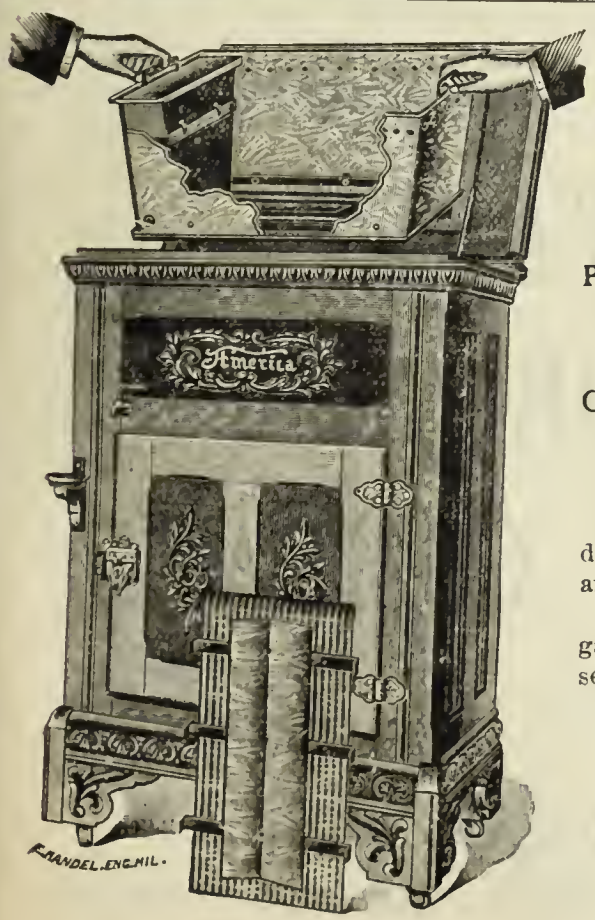


HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to
The Mica Mfg. Co.
JOHN O'NEILL, Prop.,
88 Fulton St. N. Y.



The America!
GEM OF
REFRIGERATORS.

Patented Removable
Ice Compartment

Can be kept clean with the least trouble.

Its construction for cleanliness, drainage of waste water, circulation and insulation is perfect.

Write for catalogue and investigate our claims. It will pay you to secure the agency in your town.

THE
Bowen Manufacturing Co.,
FOND DU LAC, WIS.

— LITTLE GREGORY: "Papa, why do you say that the pen is mightier than the sword?"

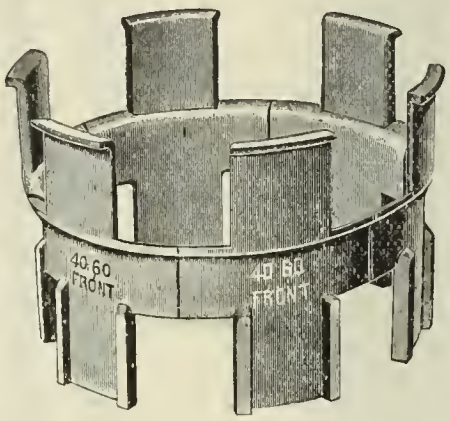
Papa: "Because you cannot sign checks with a sword."—*Revue Anecdotique.*

HOWARD FURNACES

HOT = AIR = BLAST
~ATTACHMENT.~

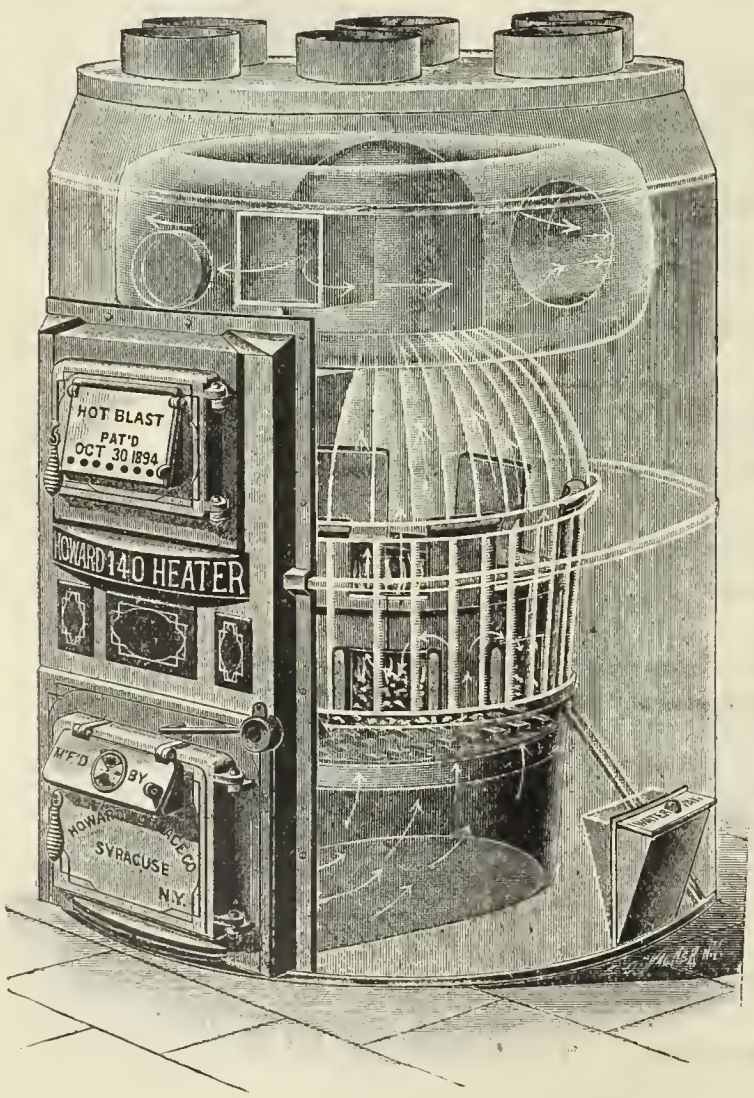
BURNS SOFT COAL

TO A WONDERFUL DEGREE OF PERFECTION, WHICH GIVES OFF LITTLE SMOKE AND EVOLVES A LARGE AMOUNT OF HEAT.



HOW IT IS DONE.

BY MEANS OF THE HOWARD HOT AIR BLAST, HEATED AIR IS INTRODUCED TO THE FIRE, CAUSING A MORE RAPID MIXTURE WITH THE COMBUSTIBLE GASES. CONSEQUENTLY THE WHOLE PROCESS OF COMBUSTION IS QUICKENED IN INTENSITY AND MADE MORE COMPLETE.



SEND FOR CATALOGUE

AND SECURE AGENCY.

HOWARD FURNACE COMPANY,

MAIN OFFICE AND WORKS, } **Syracuse, N. Y.**

BRANCHES:

NEW YORK, BOSTON. GRAND RAPIDS. TORONTO.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 2, 1895.

DAVID WILLIAMS - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 9.
Index to Reading Matter.....Page 55.

Observation.

The habit of observation is one that may well be cultivated by every mechanic. To the practical man knowing but little of books and dependent almost entirely upon experience, there is, in fact, no other way by which he can obtain the information which is of use to him in his work. And yet there is a marked difference in individuals: some have their eyes so wide open and the faculties so ready to receive new impressions that nothing seems to escape them, while others plod along in the same old rut, looking neither to the right nor the left, and as a consequence absorb practically nothing from the progressive age in which they live. There is certainly no reasonable excuse for a lack of the faculty of observation. It is something that improves by using and more completely than anything else takes a man out of himself and makes of him a part of the world in which he moves. The story is familiar of the man of noted ability and extended knowledge who formed in youth the habit of observation by looking into store windows as he passed at his ordinary gait and then enumerating the various articles he had thus noted in his brief glance. To those who are older and have taken up some trade or profession, there is necessary only the spirit of perseverance. Make up your mind that each day you will, by observation, learn at least one new thing. Determine that, particularly in matters of importance, you will understand whatever comes in your way—the why and the wherefore. So far as it is proper to be inquisitive, ask questions, seek information far and wide, but do it intelligently or all will go for naught.

Travel.

It is hardly to be expected that the ordinary mechanic will have even the most modest opportunity for travel in the broad sense in which foreign tours are generally denominated. Nevertheless in his smaller sphere he has some chance to go about, to see new faces and new things, and, if he will, he may profit by them, proportionately, as the foreign tourist by his extended travels. Certainly nothing broadens a man in a general way as does travel. The lessons of the Fair are still fresh in our minds, and to many individuals a week in that wonderland of the age has marked an expansion in judgment and a comprehension of the world and its opportunities such as never came to them before. Many a mechanic who, by the character of the trade he follows, is compelled to go from place to place may well keep his eyes open. If he goes among other workmen in his own line, he will find much to be learned that is new to him, even if he be a full fledged journeyman, and if he is the progressive man that he should be, he will profit by all that is good and throw aside all that is useless. If it is his duty or privilege to go through other shops or manufactories he will see new methods, new tools, ingenious hints and convenient appliances, a knowledge of which, obtained by careful observation, may some time prove of inestimable value. Then, too, he will meet men whose characteristics he does not know, and his wits will be sharpened to estimate them at once and deal with them understandingly. He will see human nature in all its moods, and will be successful—particularly as a salesman—in so far as he is capable of adapting himself to those moods and thereby obtaining the sympathetic attention of the person with whom he deals.

Commissioner of Patents John S. Seymour, in his report of the work of his bureau for the calendar year 1894, just submitted to Congress, shows that during the year there were 20,803 patents granted and 1600 trade-marks registered. The patents expired in the same period numbered 12,920. The total expenditures were $1,100,047. The receipts over expenditures were $87,392, and the total balance to the credit of the Patent Office in the Treasury of the United States amounts to $4,369,135. In proportion to population more patents were issued to citizens of Connecticut than to those of any other State. Next in order in proportion to population are Massachusetts, the District of Columbia, New Jersey, Montana, Rhode Island, New York and Colorado. As to foreign countries, more patents were issued to subjects of Great Britain than of any other country, Germany and Canada coming next in order. The Commissioner recommends that the working force of the Patent Office be increased in order to adequately meet and keep pace with the growing work of this department.

Co-operative Trading in Great Britain

The "Annual" of the Co-operative Wholesale Societies, Limited, of England and Scotland for 1895 gives some interesting facts and figures in regard to the progress of the commercial co-operative movement in Great Britain during the first 30 years of its existence. In that period, from 1864 to 1893, inclusive, the aggregate sales of the societies amounted in round numbers to $525,000,000 dollars, on which the profits amounted to $6,500,000, notwithstanding the fact that the profit charged on the purchases of the members was merely nominal. The average yearly increase in sales has amounted to nearly $2,250,000, the aggregate for 1893 approaching $50,000,000. In the last ten years the volume of sales has more than doubled. The number of branch societies holding shares in the Co-operative Wholesale Society is 1010, with a total membership of 873,698. Its share capital is $2,736,720; loans and deposits, $4 403,915; reserve fund, $171,900, and insurance fund, $1,156,-243. The Co-operative Wholesale Society has branches in all the principal cities and towns of Great Britain and Ireland, as well as in the chief European seaports, running a line of six steam vessels for the conveyance of freight to its branches abroad. It has its own banks and owns a considerable number of factories in the United Kingdom, where it manufactures most of its own products.

The magnitude of the commercial co-operative system, as now existing in Great Britain, is only paralleled by the remarkable success which has attended the movement. It must be borne in mind that the particular aggregation of societies above alluded to does not by any means embrace all the co-operative trading associations in the country. There are many, some being of the first importance, which are not affiliated with it. The total sales for the past 31 years of all such societies in Great Britain and Ireland have been over $3,283,700 000 in value, at a profit of about $285 500,000, upon a share capital of $70,308,980 and a loan capital of $16,113,350. They have a total membership of over 1,300,000.

The Mayor and Council of Cadiz, Ohio, are advertising for bids for the furnishing and erecting complete of the air lift machinery necessary to pump from drilled wells the water to supply the pumping station in the said town. The materials will consist of two compressors, a receiver, four or more foot pieces and lubricators, gauger, &c. They also want bids for furnishing the material and performing the labor necessary for the construction of the system of water works, requiring 450 tons of cast iron pipe, 10 tons of special castings, 50 hydrants, 39 valves and boxes, 2 pumping engines, 2 boilers, brick pumping station and stack, pump well and 22 776 lineal feet of pipe laid. The plans will be ready by March 1, 1895, and the proposals will be received until noon Tuesday, March 19. James Moore is the Mayor and L. E. Chapin of Canton and W. G. Clark of Toledo are the consulting engineers.

THE LETTER BOX.

Are Gravel Roofs Durable?

From G. F. WHEELOCK, *Birmingham, Ala.*—I notice in *The Metal Worker* of February 16 that your correspondent "G. D. B." of Greenville, S. C., makes the assertion that he can put on a good tin roof at $4 per square, and make more money on it than he could with a gravel roof at $5 per square. Being engaged in both tin and gravel roofing, and being of a very inquiring turn of mind, I would like to have him inform me where he buys his plate, it being presumed that to furnish a good 20-year roof he would only use a good redipped tin, and the best I have been able to do is $15 per box in the market for this grade, and this, without any freight added, is equivalent to $4.30 per square for tin alone for a standing seam roof. I cannot help thinking that you have misquoted "G. D. B." as to the $4 roof; either this, or he is basing his calculations on a very cheap plate; and unless he has the advantage of buying a superior plate at a price that others would pay for wasters, he certainly must have a very poor opinion of a gravel roof. A gravel roof, in my opinion, especially where asphalt is substituted for coal tar composition, is the best material for a roof where the pitch does not exceed ¾ inch to the foot. It has the advantage of a tin roof, when properly applied, of being a first-class roof under any climatic conditions, which is not the case with the metal. In this city tin roofing, where laid flat locked and soldered, has proven very unsatisfactory, due, I suppose, to the presence of our iron furnaces to a great extent. There is one argument which is a good sized club in the hands of the gravel roofer: the roof does not require painting every two years, which is a fixed charge on a tin roof that in a few years amounts to the first cost of the roof.

As the result of my experience, I want to make the "assertion," which will not probably meet with the approval of "G. D. B.," that a first-class gravel roof can be laid for less money than a first-class tin roof, with a greater profit for the roofer, if gravel or shell can be procured within 200 miles of the work.

Insurance Rates on Gasoline Stoves.

From J. G. F. W., *Indiana.*—I was interested in the letter that appeared in *The Metal Worker* recently, respecting the rates of insurance where gasoline furnace is used. We have inserted in our policy permission to use gasoline for soldering pots, and to have 1 gallon of benzine for blacking purposes, to use gasoline stoves for exhibition purposes and to sell gasoline, stipulating where the gasoline shed is located, and that it be drawn by day only. We paid no extra rates.

Frozen Wind Mill Tanks.

From W. A. F., *Matawan, N. J.*—I have several customers who have water tanks supplied by wind mills. The tanks stand on towers 30 feet from the ground, the feed and supply pipes being wrapped with two layers of ¾ inch hair felt and incased in a box packed with salt hay. During the last cold snap the water froze on the bottom of the tanks 2 or 3 inches thick. This, of course, stopped the flow of water and allowed the feed pipe to freeze in the box. Will any of the readers of *The Metal Worker* inform me if they have had a like experience and if so can they suggest a remedy? Any information they can furnish through the Letter Box will be much appreciated.

Heating of Tin Roofs.

From J. G. F. W., *Indiana.*—I notice the inquiry from "G. D. B." in *The Metal Worker* of February 16, who complains about heat of tin roofs. I would suggest, however, that all difficulty can be removed if he will put paper underneath the tin.

Scant Radiation.

From HOT WATER, *Pennsylvania.*—I have had placed in my residence a hot water heater, with results that are very unsatisfactory. The heating contractor contracted to heat the house to 70° in zero weather, which it is impossible to do, although the temperature of the water in the heater is 200° and all the radiators hot. Will you please advise me if the defects are in the boiler, radiation, or system of piping?

Answer.—The chief causes of dissatisfaction in hot water heating are: 1. Insufficient boiler. 2. Improper system of piping. 3. Insufficient radiation. If the boiler is capable of maintaining a temperature of 200° when supplying all the radiators, it is evident that it is sufficient. If the system of piping delivers the water to the radiators so that it is possible to maintain the same temperature in all with all valves open, it is evident that the piping system is properly constructed. If the boiler maintains and the system of piping delivers the water at high temperatures to the radiation, and the rooms are not heated to the temperatures desired, the cause is insufficient radiation. It is evident from your description of the apparatus that "insufficient radiation" is keeping you in "hot water."

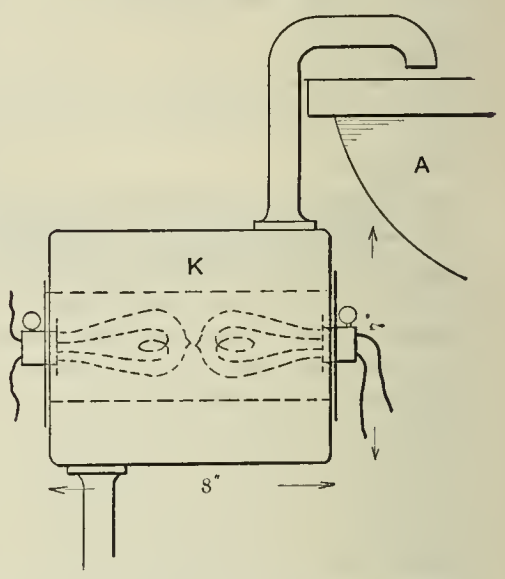
Paste for Asbestos Paper.

From J. CALLAGHAN & SONS, *Cleveland, Ohio.*—We would be very thankful to you or your readers if you would favor us with a recipe for a paste to stick asbestos paper on hot air pipes. Something that will keep and not get sour and smell.

Note.—Some furnacemen simply soak or wet the edges of the paper thoroughly and make a good lap, and when the paper becomes dry there is no need for a paste. Our readers are invited to describe their methods.

Heating Water by Incandescent Lamps.

From C. F. N., *Brooklyn.*—In answer to "J. R.," Hoboken, N. J., who wishes to know a way to heat water for lavatory purposes by means of incandescent lamps for a customer in an office,



Heating Water by Incandescent Lamps.—Fig. 1.—Basin with Water Cylinder.

the following rough sketch will give him some idea of fixing up a cylinder or a coil of piping for the purpose. In Fig. 1, A is the basin and K is a metal cylinder 6 x 7 inches with a hollow core formed of a 3-inch metal tube, as indicated by the dotted lines. The cylinder contains, roughly, nearly 3½ pints of water. Fig. 2 shows one of the lamps with a metal guard of 3½ inches and fixed on an ordinary holder with a switch combination. These lamps go on at each end of the cylinder as shown in Fig. 1. The radiant heat of the lamp communicates

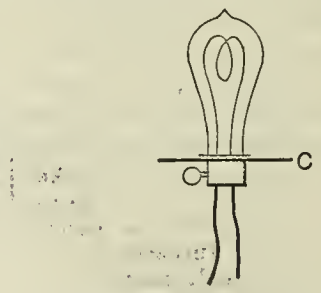


Fig. 2.—Lamp with Metal Guard.

to the water by means of the metal surrounding it. About 75 per cent. of the electrical energy is efficiently utilized this way in heating the water and about 10 per cent. additional is retained in the metal. The two lamps shown in the sketch are ordinary 16 candle power, running on a 100-volt circuit. If the cylinder is made of thin copper the time

that the water will take to boil is about 45 minutes; then one lamp can be switched off and the other lamp will evolve enough heat to keep the water at boiling point till wanted. The lamps can be easily fixed on the ends of the cylinder by suitable clips catching on the metal shield of the lamp holder C. Fig. 3 explains itself. The only difference between it and the plan shown in Fig. 1 is that there is no inner tube and a coil surrounds the lamps instead of a water jacket. The inside diameter of the coil should be 3 inches or a little more than the diameter of the lamps used. If "J. R" goes to any electrician he will get a suitable device by means of which the wires connecting the lamps can be taken to the desk of his customer in the office so that he can himself control the heating of his lavatory water.

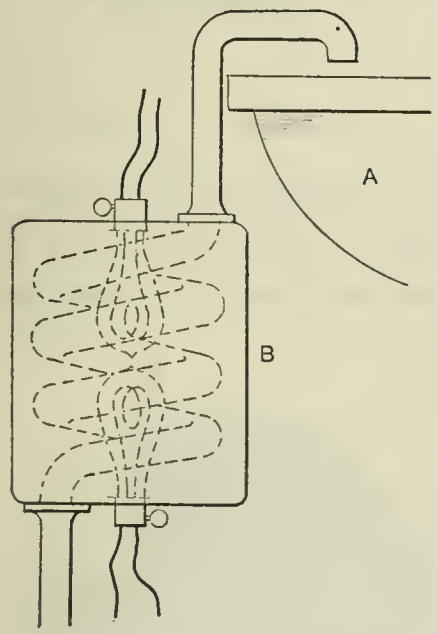


Fig. 3.—Basin with Coil in Cylinder.

Blackened bulb lamps, whose light giving properties are impaired, can be economically used in the cylinder for heating.

Anti-Freezing Mortar.

From G. H. W., *Takoma Park, D. C.*—In *The Metal Worker* of February 16 a correspondent of yours asks for a frost proof mortar. A recent item in a technical journal, translated from an Austrian publication, gives the result of a series of experiments on the subject, and states that Portland cement mortar mixed with a 7 per cent. solution of salt water and laid with dry brick or stone gives satisfactory results, lime mortars or mortars containing lime being of no value. The *American Architect* advises, as the result of experience, that the stone or brick used should be heated, likewise the mortar, the object being to retard the freezing sufficiently to permit the cement to set. A furnace such as is used in making asphalt mixtures for floors or paving can be successfully used for the purpose.

A Cold Air Duct.

From J. H. R., *Munhall, Pa.*—In *The Metal Worker* of February 2 I find described by "J. S.," Pittsburgh, Pa., a very admirable form of cold air duct and light shaft combined. While not wishing to criticise, I beg permission to offer one alteration which I believe would render it more complete. It is that the slide B should be made in the form of a sash, so that at all times, whether closed or open, light may be transmitted to the cellar. I hope this suggestion may meet the approval of the inventor.

Which Is Best For Furnace Tops?

From J. C., *Cleveland.*—We would be very much pleased to receive the opinion of the readers of *The Metal Worker*, also the results of their experience, in taking hot air pipes from the top of the casing hood on furnaces. We have adopted this plan for the past year, and we are now experiencing some trouble, and we lay it to this method of piping. We make our hood from 7 to 10 inches high, perfectly flat top, with a 2-inch sand ring. We notice the majority of furnace manufacturers show in their illustrations of different furnaces that pipes are taken from side of hoods, but our understanding of this method is that their furnaces are too high to use any other way. Our trouble has been that we do not obtain the force of hot air from the registers that we ought with a good hot fire, having furnace properly arranged, cold air duct and pit of ample size. Any information that your readers can give us through your valuable paper will be thankfully received.

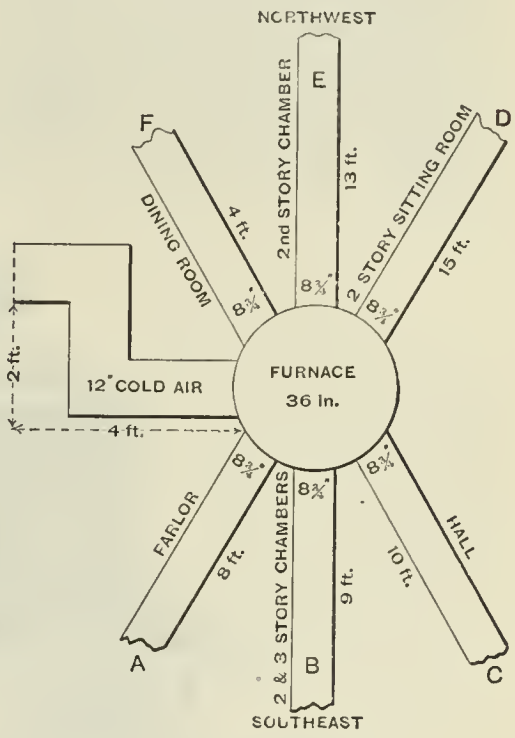
Making An Oil Tank.

From J. G. F. W., *Indiana.*—Replying to the inquiry of "W. R. T.," who asked about an oil tank in *The Metal Worker* of February 16, I would make a box 16 inches square and 8 feet long, and then line it throughout. It is easier made and will stand rougher usage. The best size of pipe to use is 1 inch galvanized wrought iron.

Trouble with Furnace.

From DEALER, *Philadelphia.*—I inclose the plan of a house heating furnace as put in by a customer of mine. The work was well done, as it was intended to be a sample job. The furnace operates in a manner different from any I ever heard of and is a puzzle to the customer and myself. The furnace is 36 inches in diameter, has six 8¾-inch heating pipes and a 12 inch cold air supply. The house is protected by a dead wall on one side and has a 4-foot yard on the other. Pipe A leads to the parlor, is 8 feet long, and cold air comes out of this pipe. Pipe B leads to second and third story chambers, is 9 feet long, and operates properly. Pipe C leads to the hall on first floor, is 10 feet long, and remains cold. Pipe D leads to the back sitting room in second story, is 10 feet long, and operates properly. Pipe E leads to chamber in second story, is 13 feet long, and operates properly. Pipe F leads to dining room on first floor, is 4 feet long, and gets hot last.

Answer.—An inspection of the plan inclosed by our correspondent shows there are six 8¾ inch heating pipes leading from the furnace to the upper rooms. The area of a pipe 8¾ inches in diameter is approximately 60 square inches, so the combined area of the six pipes would be 360 square inches. The cold air supply pipe is 12 inches in diameter, and has an area of 113 square inches, approximately. It is usual with furnacemen to have the cold air supply equal to three quarters of the combined area of the heating pipes. Following the above rule, the cold air supply pipe should have an area of 270 square inches, or 157 more than a pipe 12 inches in diameter. In order that the furnace should have a proper supply of cold air, a rectangular pipe 12 x 22½ or a round pipe 18¾ inches in diameter would be the size required. By holding the hand over the parlor register it may appear that cold air is coming up, when it is really passing



Trouble with Furnace.

down, as can be determined by holding a lighted match over the register. As the cold air supply is not sufficient to give the proper amount of air to the furnace, some of the pipes do not operate, while one or more of the pipes may allow the cool air from the floor to pass down to supply the deficiency. For a remedy it is suggested that the cold air supply be enlarged as indicated above and the sharp turns removed from it. It is natural for hot air to flow to the highest point of escape, which accounts for the pipes to the upper rooms being heated.

Enameling Gasoline Stoves.

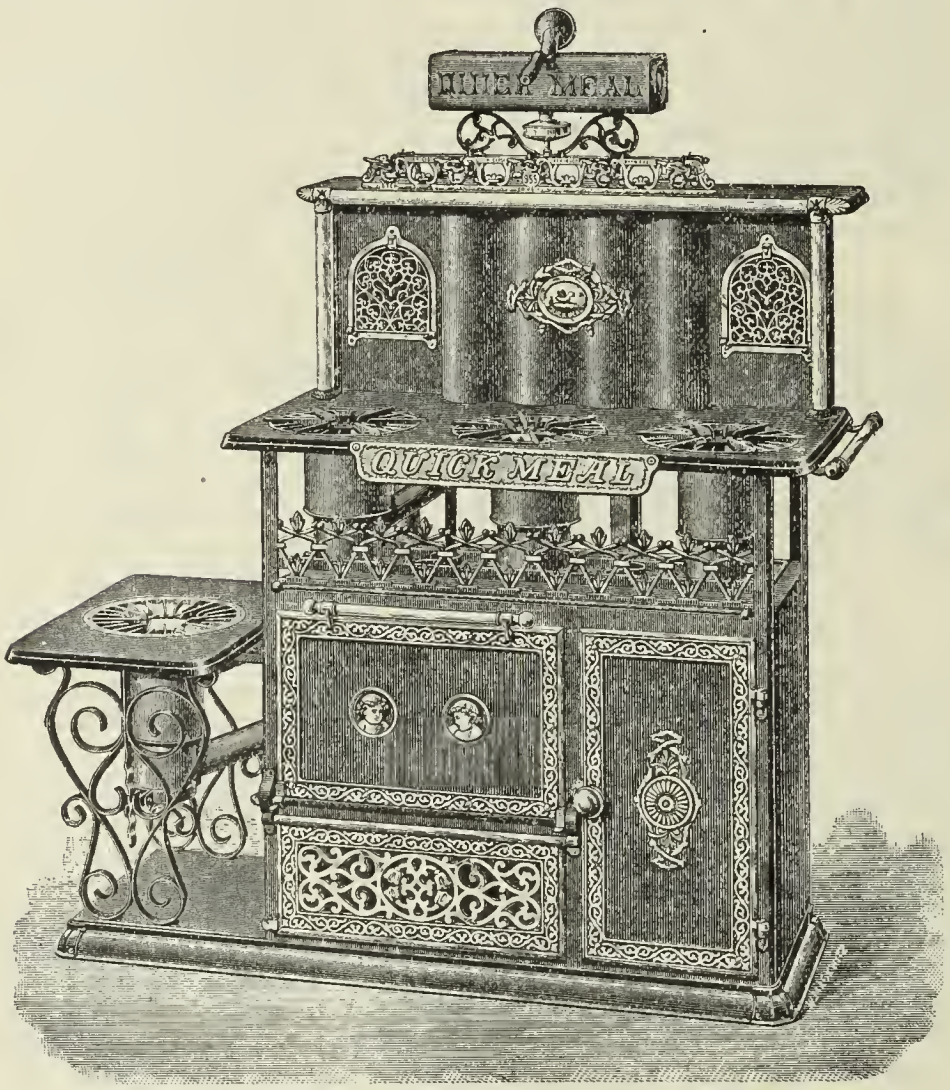
From J. G. F. W., *Indiana.*—In reply to "W. R. T.," whose inquiry appears in *The Metal Worker* of February 16 respecting enameling stoves, would say: Remove all the dirt by scraping, then wash all over with gasoline to remove the grease; then apply Bonnell's Nubian Enamel. If it is too thick, thin it with turpentine, and if too cold, set the can in hot water. A better way still is to unbolt the top and send it back to the factory, where it can be baked on and a better job made.

Troubles are believed to be again on the point of breaking out in the pottery industry of Trenton, N. J., owing to recently introduced reductions in the wage scale.

THE RETAIL STORE.

The Quick Meal Gasoline Stove.

The Ringen Stove Company of 414 and 416 North Broadway, St. Louis, Mo., have incorporated a number of interesting improvements in their line of Quick Meal gasoline stoves for the season of 1895. Prominent among these may be mentioned the balanced oven door, which is claimed to work without noise and is so adjusted that one finger will open or close it. The weight working inside of the flue is connected direct to the hinge of the door, thus balancing it and saving it from breakage. When the door is closed the weight swings out of the flue, so that while baking is in progress there is nothing in the flue to obstruct it. Another feature for this year is the Quick Meal tank, which is provided with a detachable and cleansible float. No packing is used and all the joints are metallic. The heads on the tank are not only soldered, but are doubly seamed on a special machine made for the purpose. The drip valves are provided with stuffing boxes, which prevent leakage in case the valves become worn from long use. The stove is constructed with a steel base formed like the front, and, it is claimed, will never break. In the case of the step stoves the base extends entirely under the range and step, thus adding to the general appearance of the stove. The grates are loose so that they can be taken off, leaving the stove top smooth and easily cleaned. In the accompanying illustration we present a view of what is known as the Quick Meal No. 955, which the company are offering for family, hotel or restaurant use. It has three burners in the top surface and an extremely strong one under the step. There are also two under the oven, making a total of six. The general appearance of the range is improved by a nickel towel bar and polished nickel plated rail along the top edge of the high shelf, which is supported by polished nickel plated uprights. This line of ranges is constructed of cold rolled steel and is of first-class workmanship throughout.



Quick Meal Stove No. 955.

The Yankee Sprinkler.

The Cleveland Lock Company, Cleveland, Ohio, are introducing the lawn sprinkler shown in the accompanying cuts. The sprinkler is made in one piece, with a cord for drawing it around on the lawn. The hinge shown in Fig. 1, at the top of the device, is raised to throw a half circle, as in Fig. 2, and is laid flat to produce a full circle of spray, as in Fig. 3. It is explained that the sprinkler has a sprinkling capacity of from 35 to 40 feet in diameter, according to the pressure; that it

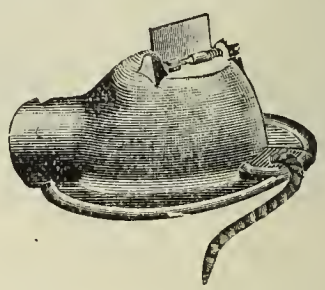


Fig. 1.—The Yankee Sprinkler.

can be placed close to the sidewalk (Fig. 2) and not wet passers by, and that it can be moved over the lawn by the cord without turning off the water or wetting the feet. It is claimed that

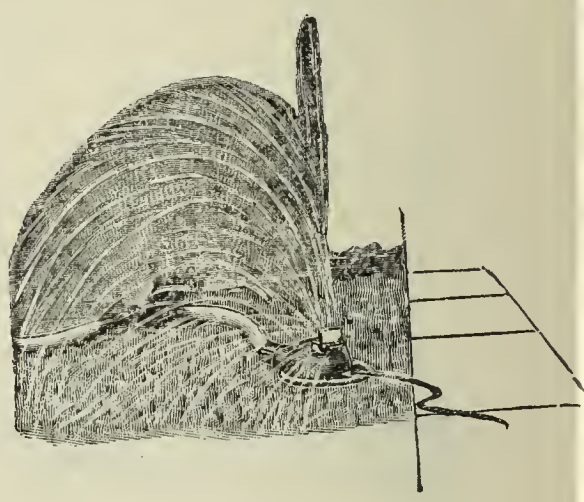


Fig. 2.—The Yankee Sprinkler's Half Spray.

there are no revolving parts or small holes, thus leaving an opening in the sprinkler the same size as that in the coupling, so that there is no back pressure on the hose. The sprinklers are

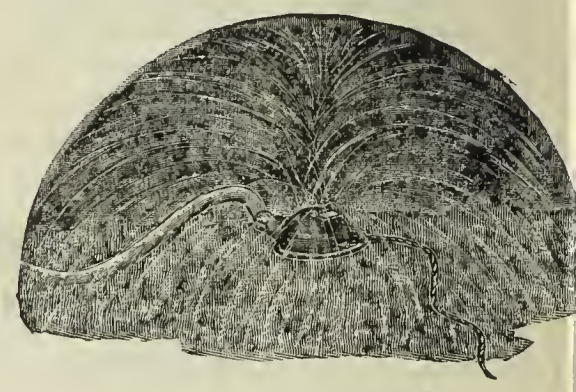


Fig. 3.—The Yankee Sprinkler's Full Spray.

furnished japanned and galvanized, packed one in a box, complete with cord and a rubber washer.

S. M. PORTER is fixing up a building on Main street, Bristol, Conn., with a view to opening a tin and stove store, also a plumbing department. The firm name will be S. M. Porter & Sons.

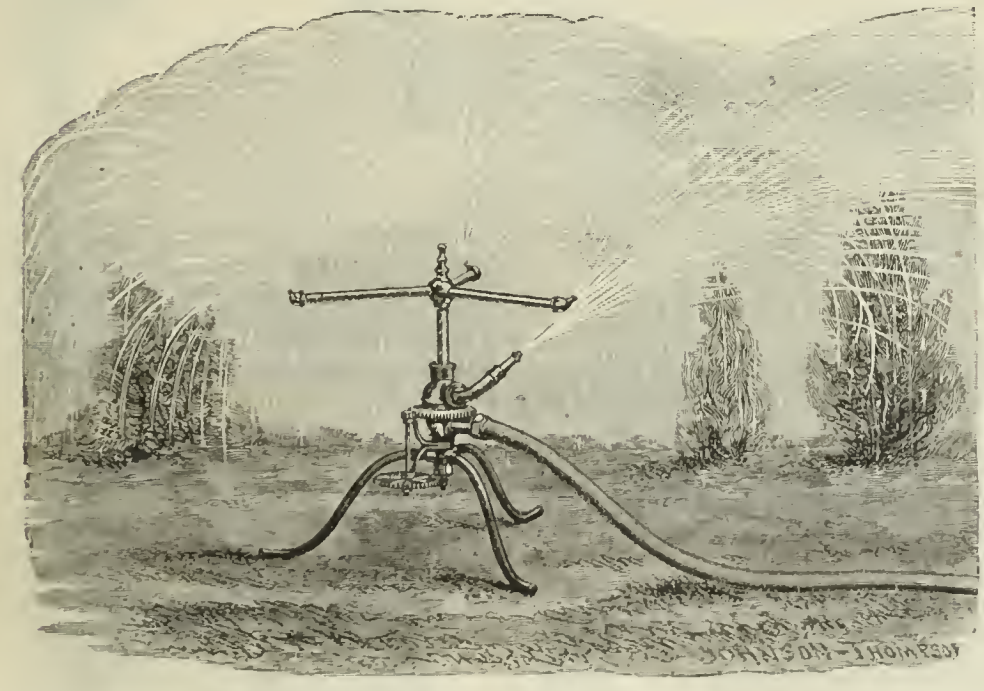
Kitchen Time Table.

The following table is issued by the Oven Thermometer Company of Ironton, Ohio, and as being of possible interest to our readers we present it herewith.

Beef, sirloin rare	400	degrees per lb	8 min.
" " well done	450	" "	12 "
Bread, white loaf	450	"	50 "
Biscuit	750	"	5 "
"	650	"	10 "
Cake, fruit	450	"	2 hrs
" sponge	350	"	45 min.
" loaf	350	"	45 "
" layer	550	"	10 "
Cookies	750	"	5 "
Chickens	400	"	2 hrs
Custards	550	"	30 min.
Duck	400	"	2 hrs 30 "
Fish	400	"	40 "
Ginger Bread	400	"	30 "
Graham Gems	600	"	10 "
Halibut	500	"	30 "
Lamb	400	"	1 hr 30 "
Mutton, rare	400	" per lb	8 "
" well done	450	" "	12 "
Pie Crust	650	"	10 "
Pork	450	"	2 hrs 30 "
Potatoes	550	"	1 hr 15 "
Pudding, bread	550	"	30 "
" plum	450	"	1 hr
" rice	550	"	30 min.
" tapioca	550	"	40 "
Rolls	500	"	30 "
Turkey	400	"	3 hrs
Veal	550	"	1 hr 30 min.

The Comet Lawn Sprinkler.

E. Stebbins Mfg. Company, Brightwood, Mass., are putting on the market the lawn sprinkler shown in the accompanying cut. The sprinkler, except the legs, is made of solid brass, well nickel plated. The device is made with the globe or body in two parts, and by means of the swiftly revolving arms and intermediate gears the upper half of the body is made to revolve slowly around, carrying the hose nozzle, from which a large stream of water is thrown far out beyond that thrown by the arms, thereby covering, it is claimed, four times the space covered by the ordinary form of stationary sprinkler. It is stated that with an ordinary force of water the sprinkler will thoroughly sprinkle a space 80 feet in diameter; that the hose nozzle and the tips on the ends of the arms are adjustable so that it can be adapted to as small a space as is desired, and that the sprinkler is substantial, durable and attractive in appearance.



The Comet Lawn Sprinkler.

Standard Fiber Ware.

The Standard Fiber Ware Company of Mankato, Minn., have issued a circular describing improvements recently made in their goods. They have had expert chemists working for the best possible water proofing and finish, and believe they have it. They have also had expert machinists at work on a pail which will have the elasticity, strength and durability of the wound flax fiber pail, without its weak bottom. The new pail is called a truss bottom pail, being made with the bottom in a separate piece. The bottom is convex in shape, with a dished rim fitting inside the lower part of the pail. A steel band is fitted over the edges of the bottom and the pail body, which is then placed under powerful steel rollers. They compress the bottom and side into one compact body, the parts being so completely united that they cannot come apart. The convex shape of the bottom strengthens that part of the pail, and also prevents it from coming in contact with the floor or ground.

Steel Mortar and Brick Hods.

The Geauga Foundry & Mfg. Company, Painesville, Ohio, have recently put on the market Ohio water tight steel mortar and brick hods. The bodies of the hods are described as folded from a single piece of sheet steel without cutting the metal and as being reinforced on the edges and at the dumping point. The hods are provided with a malleable iron fork and wooden shoulder saddle, allowing the user to attach cloth, if desired, to the under side of the saddle. The malleable fork is provided with a socket for holding a hardwood handle, the socket being so constructed as to allow the shrinkage of the handle to be taken up and to readily replace a broken handle. The hods are furnished black or galvanized and are shipped knocked down.

MEMORANDA.

The Bradley & Hubbard Mfg. Company, with factory and offices at Meriden, Conn., have issued circulars calling the attention of the trade to some of their heaters. Among these may be mentioned the Orient heater, embodying a novel application of the mammoth central draft lamp, supplying both heat and light at the same time and at very little cost; also the B. & H. oil heater, having Russia iron drum and nickel plated finish. This heater is said to be of sufficient capacity to warm a good sized room, and that the lamp can be used for lighting purposes by removing the cylinder and holder and putting on a No. 89 B. & H. chimney.

Manning, Bowman & Co., 57 Beekman street, New York, announce that they have decided to remove to new quarters on May 1 next. In the interval they will offer their New York stock, including staples and regular goods, as well as some lines from their inventory, in old patterns and job lots, which will be closed out complete at quotations to please close buyers. They state that after removal all orders will be shipped direct from factory to customers. They believe that the trade will be equally well served in this way, all their staples and new goods being on exhibition at their showroom, while salesmen will call upon customers as heretofore. Due notice will be given concerning their new location.

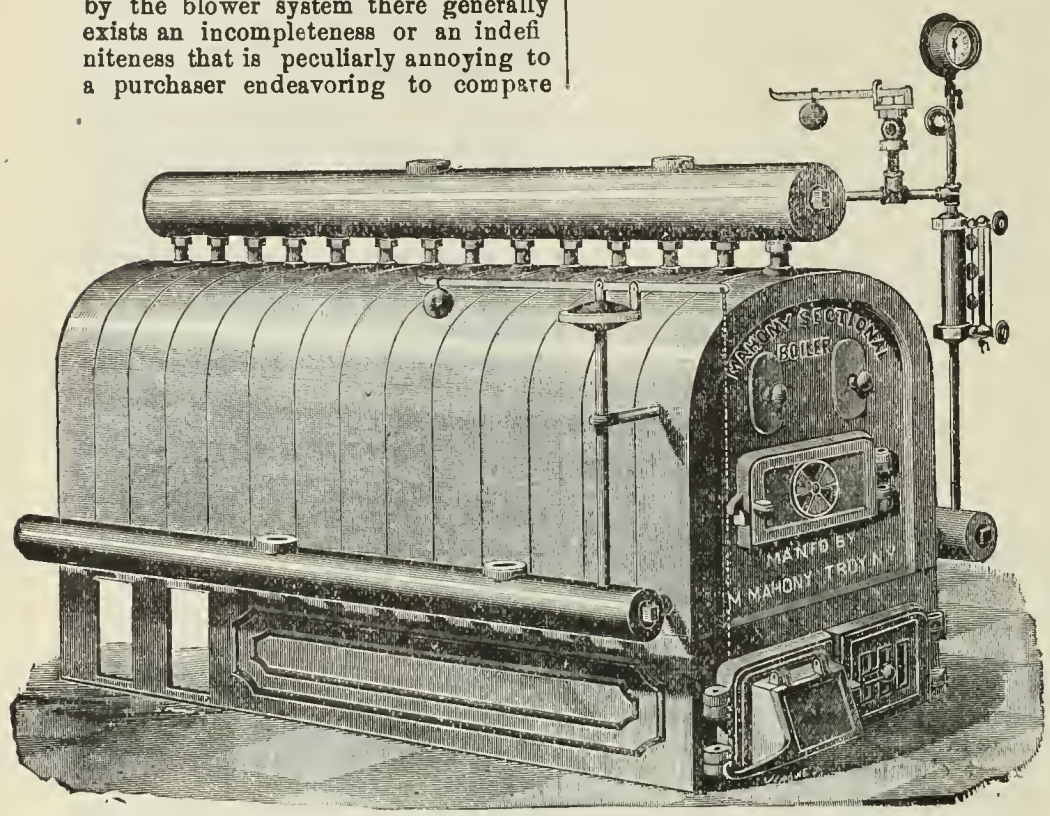
The Cleveland Stamping & Tool Company, Cleveland, Ohio, manufacturers of Solid Steel Seamless Hollow Ware, issue a supplementary catalogue for 1895 in which is shown a line of Hollow Ware made from cold rolled wrought steel, highly tempered, including Spiders, Griddles, Broilers, Kettles, Scotch Bowls, Stew Pans, &c. The company advise us that their regular catalogue will be ready about April 1.

The distress among the settlers in some parts of Western Kansas has been so severe that the people have been eating horseflesh, not being able to get other food. They are training their cows to draw plows, &c., and by this means the farmers hope to be able to put in a crop this spring.

STEAM AND HOT WATER.

Blower Specifications.

From W. S. N., *New York.*—In the specification of apparatus for heating by the blower system there generally exists an incompleteness or an indefiniteness that is peculiarly annoying to a purchaser endeavoring to compare prices. One bidder may give the size of the fan wheel, while the other gives only the nominal size of the fan housing. One may describe the heater as of so many lineal feet "capacity," another may clearly specify the exact number of feet of pipe. Even when an expert has drawn the specifications they are not always as definite as they should be. It is not at all unusual to find a fan indicated only as to be sufficient to deliver a certain amount of air, with neither speed nor power stipulated, or again an impossible combination of volume, air pressure and horse-power may be demanded. It would appear that under ordinary conditions the exact size of the fan wheel and its general construction should be specified as well as the actual size of the heater.



The Mahony Vertical Section Steam or Water Boiler.—Fig. 1.—Showing the Boiler Arranged for Steam.

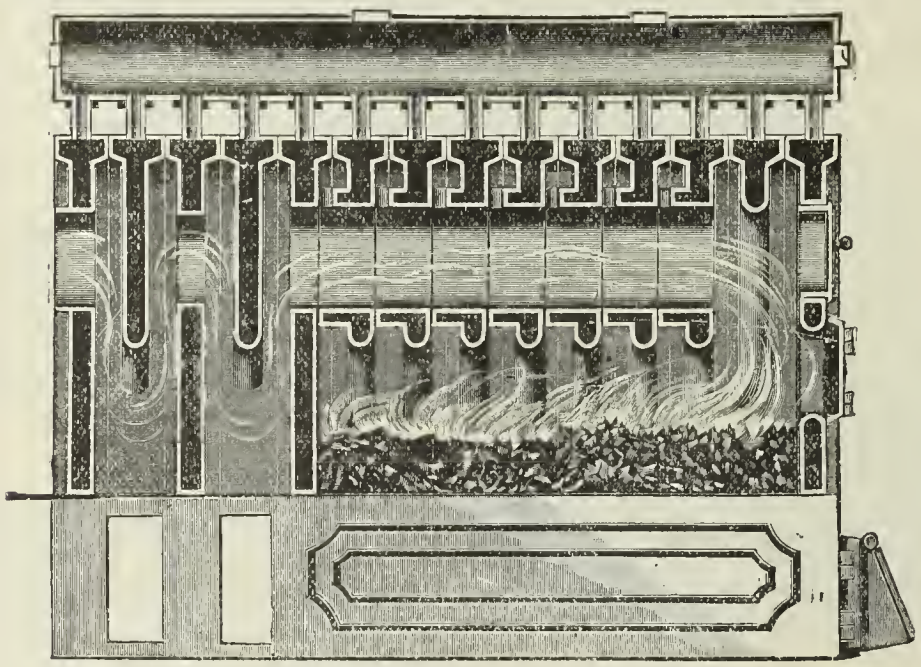


Fig. 2.—Longitudinal Sectional View.

The Metal Worker was favored this week with a call from James A. Harding, who takes a hearty interest in the welfare of the American Society of Heating and Ventilating Engineers.

The Mahony Vertical Section Steam or Water Boiler.

One of the latest boilers brought out is the Mahony vertical section boiler for either steam or water, made by M. Mahony, Troy, N. Y., and which is shown in the illustrations herewith. Though it is now being offered to the trade generally for the first time, it has been under test for the past two years. The special features claimed for the boilers are vertical water ways, large fire surface, and the arrangement of the flues to utilize the heat of the gases. Fig. 1 shows a general view of the steam boiler with the draft regulator, steam gauge, safety valve and water glass.

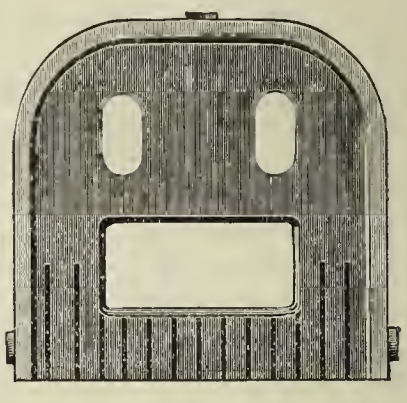


Fig. 3.—Front Section.

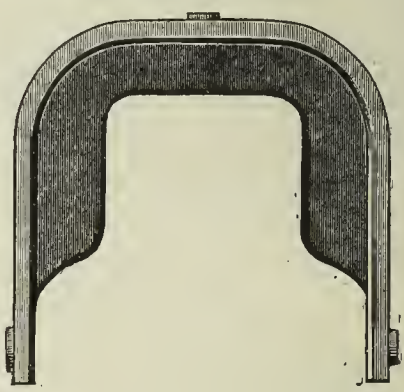


Fig. 4.—First Section Over Fire.

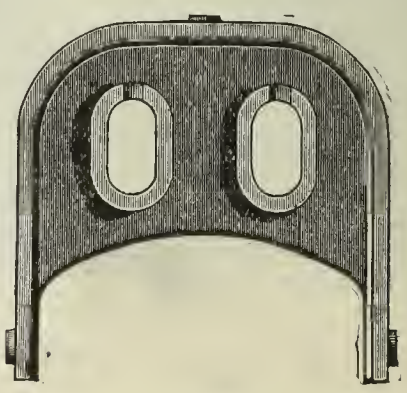


Fig. 5.—Section Over Fire.

Fig. 2 is a longitudinal sectional view of the boiler at the center showing the arrangement of the sections and the course of the products of combustion as they pass through to the chimney. Fig. 3 shows the front section of the

boiler with openings for cleaning the flues and for the feed door. Fig. 4 shows the first section over the fire, designed to permit the gases to pass up to the flues in the sections over the fire which are shown in Fig. 5. Fig. 6 shows the back section of the fire box with the outlets to the rear flues where the draft is made to take alternate down

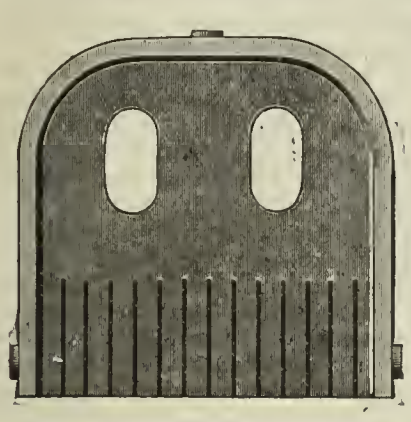


Fig. 6.—Back Section of Fire Box.

and up turns by first coming into contact with the rear down draft section shown in Fig. 7, and passing down, then rising to pass through the opening in the rear up draft section shown in Fig. 8. The back section with the smoke outlet is shown in Fig. 9. The boiler is increased in size and capacity by the addition of both fire and flue sections,

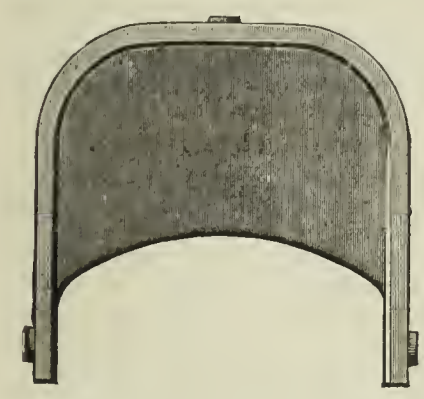


Fig. 7.—Rear Down Draft Section.

Figs. 5, 7 and 8. The sections are all independent of each other, and are connected by nipples with a return header at each side at the bottom, and a flow header or steam drum at the top. The boiler is provided with a grate that is composed of sections, for air space and durability, connected so that by work-

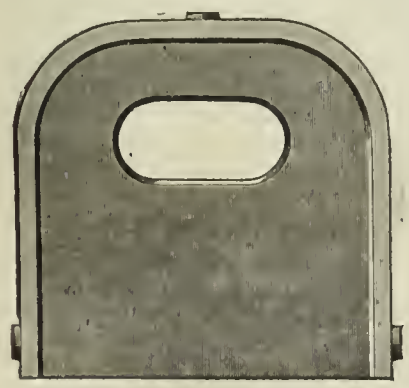


Fig. 8.—Rear Up Draft Section.

ing a lever all parts of the fire are subject alike to a cleaning when the grate is oscillated. The boiler is made in five sizes, with a fire box 31 inches wide and increasing 6 inches in length with each size from the first, which is 38 inches long; the different sizes made with 10, 12, 14, 16 and 18 sections having respectively 8, $9\frac{4}{10}$, $10\frac{3}{4}$, 12 and $13\frac{1}{3}$ square feet of grate surface. The boilers are rated to carry 1600, 1800, 2100, 2400 and 2700 square feet of direct steam radiation, and 2700, 3100, 3600,

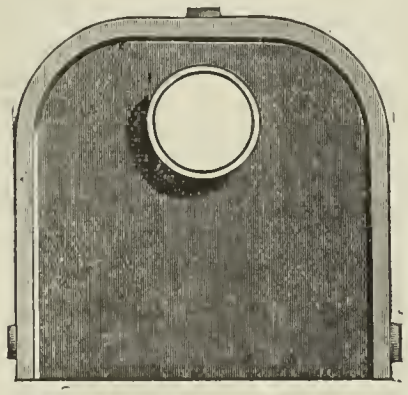
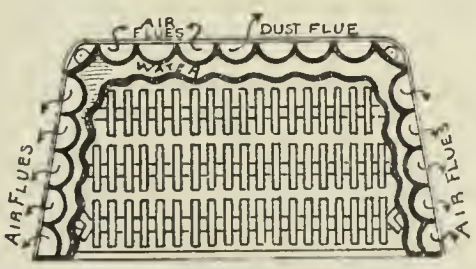


Fig. 9.—Back Section.

4000 and 4500 square feet of direct hot water radiation. The hight of the boilers is 6 feet. A new catalogue giving full details of the boilers is ready for distribution.

The Popular Hot Water Fire Place.

Our readers will be interested in the Popular hot water fire place which is being manufactured by Wray, Weitzel & Robinson, Bellwood, Pa. Fig. 1 is a plan view of the fire place at a level of the grate showing the water section and the air spaces. Fig. 2 shows a sectional elevation of the fire place and pipe connected with two radiators on the floor above for heating two rooms by direct radiation, while the fire place is arranged to heat one room on the first floor by heated air currents and the other from the fire direct and also by hot air. The fire place is made in three sizes, Nos. 1, 2 and 3. In the No. 1 the lower section only is used for water heating, while the upper section, which is exposed to the heat from the fire, is capable of heating a large volume of air. This size, it is claimed, has a capacity for carrying from 75 to 100 feet of radiation. In No. 2 both the top and bottom section, as shown in Fig. 2, are used in heating water and are rated for carry-



The Popular Hot Water Fire Place.—Fig. 1.—Plan View at Grate.

ing from 150 to 200 feet of radiation. In No. 3 the fire surface of the grate is increased so that a capacity for carrying from 200 to 250 feet of radiation is claimed for it. All sizes are arranged for using $1\frac{1}{4}$-inch flow and return pipes. In this construction all the advantages of a grate as a means of ventilation are claimed and the positive heat from direct radiation is realized, and by means of the water circulation the heat can be distributed as desired. It is further mentioned that these grates can be set and used in connection with either steam or hot water heating plants, connecting the same as with ordinary radiators. The grate is intended for private residences, public buildings and school houses, where it is said to change the air in the room as often as twice an hour, and, through the circulation of the heated air which enters, all parts of the room are kept equally warm. In describing the apparatus the point is made that there is no ventilation in a flue unless it is heated, and that the use of one of these grates makes an excellent assistant to an overtaxed hot water system, affording both additional heat and positive ventilation. For use in houses

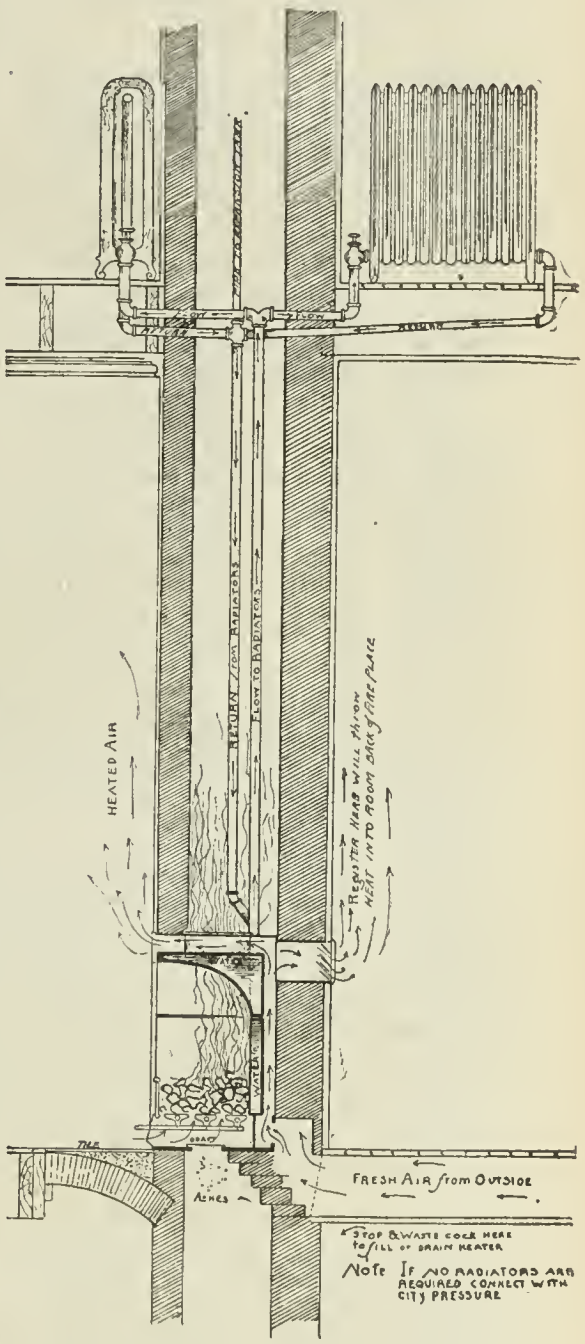


Fig. 2.—Sectional View with Radiators Connected.

where there are steam or hot water heating plants in the spring and fall, before the larger apparatus is started, the grate is said to possess special advantages. The claim is made that a large percentage of the heat generated from the fuel is realized by this system of grate heating.

An ordinance has been introduced in the Philadelphia City Council authorizing the Pennsylvania Heat, Light & Power Company to lay conduits and to use any street or alley in the city not actually occupied by a street passenger railway, and whose width does not exceed 40 feet, except to cross such streets, or to use them longitudinally where it is necessary in order to construct a continuous line. The com-

pany agree to furnish heat free to all police and fire stations, and at the city's request to any city building at a cost equal to the cost of the fuel used during the preceding year. A letter which accompanies the ordinance gives the incorporators as William B. Page of Albany, Robert Reaves, C. N. McKinney and John Taylor of Scranton, and James E. Hayes of Camden.

Hot Water Heating.*

BY JAMES MACKAY OF THE AMERICAN BOILER COMPANY.

I am pleased to be with you at this, the opening meeting of your proposed course of lectures upon practical subjects. Having gained some experience from many years of close and intimate acquaintance with the tongs and with the stocks and dies, and having passed through the various stages of steam fitter's helper and worked for years as a journeyman steam fitter, I feel, as I stand before you this evening, very much at home among you.

You no doubt are aware that I am expected to give a short talk upon hot water heating, which, if treated exhaustively, is a subject that involves a great deal more than can be even briefly outlined in the short time at our disposal. From a practical standpoint, however, we may, with profit, go over its record and its history ; take up its different methods of practical application ; trace its various stages of progress and improvement, step by step, from the earliest time at which we have any authentic record of its use up to the present time, when we find it one of the most important factors in the heating business of our country.

There are in the United States today over 10,000 men actively engaged in the sale, manufacture and erection of goods used exclusively in hot water heating, such as heaters, radiators, radiator valves, air valves, union elbows, expansion tanks, pipe, fittings, pipe hangers, floor and ceiling plates, bronzes and enamels, and when we realize that ten years ago there were not 500 men so engaged, an idea of the growth and present importance of the industry may be obtained.

The Most Ancient Apparatus.

In ancient Rome, over 1800 years ago, hot water was employed as a means for supplying artificial heat, and traces of its use for the same purpose are being at the present time unearthed from the ruins of the buried cities of Pompeii and Herculaneum. The only difference between modern practice and that of our ancient brothers is that we use iron while they used brass pipes arranged in coils, substantially the same in form and pattern as they are built by us today.

Now, while we have no positive or authentic records to show that this system of heating was used continuously or from time to time in some part of the world between the first and the eighteenth century, still it is reasonable to suppose that such was the case. In any event, we know that hot water was used in France about the year 1777 for heating incubators and brooding houses, and it appears at that time to have developed a high degree of efficiency, for it attracted considerable attention, was adopted and successfully used for heating purposes by several of the most prominent and practical men of that day.

* Read before the Steam Fitters' Protective Association, at Chicago, February 18, 1895.

Early English Heating.

From France, hot water heating found its way to England, and prior to the year 1825 was quite extensively used for heating greenhouses, conservatories and dwellings of the better class. From this time on it grew rapidly in popular favor, and was used for heating all manner of public and private buildings. Various systems of piping were employed, some of them good and some bad; but out of this experimental practice grew our modern knowledge of the subject.

One of the first arrangements of circulating mains of which we have any detailed or accurate description was a single main 3, 4, or 5 inches in diameter, ascending from the top of the heater, and from this the different branches were taken to supply coils located in different parts of the building. Each coil had one connection only, practically the same as a steam radiator is connected to-day. It was expected that the hot water would flow along the top of the main into the coils, and that the cold or return water would flow along the bottom of the connection into the main, thence along the bottom of the main into the top of the heater. This arrangement was speedily improved upon by adding a second or return connection to each coil, and connecting them with a second main, which was in turn connected with the bottom of the heater, thus providing a separate flow and return main, and producing what is now known as a two-pipe hot water job. It may be safely said that all our modern systems of piping were evolved from efforts equally as crude.

The heaters used in those early days were nearly all made of pipes, fitted in the shape of coils into furnaces of various forms, some of them being built of bricks, while others were incased in iron shells or jackets. The coils themselves were made of wrought iron pipe and sometimes of cast iron or copper. In all cases they were made exceptionally heavy and strong and were tested to very high pressures.

High Pressure System.

This precaution was very necessary, as almost all of the work was put in upon what is now known as the "high pressure" or "closed tank" system. The expansion tank was located, as it now is, at the highest point in the system, but instead of providing a safety valve or fusible plug as a factor of safety the apparatus was filled with water from the top of the expansion tank, and as soon as the desired hight of water was obtained a plug was screwed into the opening, and the entire apparatus tightly sealed up. The temperatures carried in the water under this arrangement varied from 230° to 350°, and those temperatures were uniform, or nearly so, throughout all parts of the system. The pressure maintained was also very high, and great trouble was experienced in keeping the joints tight. This system of heating served its purpose well, however, and continued to grow in public favor. The piping and other details of the work were continually being simplified and improved upon. The open expansion tank system was also introduced, and it proved very satisfactory and efficient, until, at length, about the year 1850, what was considered a high degree of excellence was attained.

Introduced in America.

About this time the system was introduced into America and was used more especially throughout the colder sections of the country for heating greenhouses. In the provinces to the north of us, owing to the extreme cold climate, it grew in great favor and was used for heating all kinds of buildings, especially large public structures and greenhouses.

My first introduction to the business was as a helper upon a large greenhouse job. The boiler, or heater, was what is known as a "Saddle Back." It was made of wrought iron and was set upon a brick arch or fire chamber. This type of boiler has long since practically fallen into disuse, though some manufacturers are still offering it for sale. The heating surface placed in the greenhouse itself was 4-inch cast iron pipe of the usual pattern. The joints were put together with rubber rings, which fitted tightly around the end of the pipe, and were thick enough to fill up the hub of the next length when the end and the hub were brought together. This made a water tight joint which was easily put together or taken apart; it was also fairly durable. One lineal foot of 4 inch pipe to each 2½ square feet of glass was put in. This proportion proved ample to maintain a temperature of 60° in the house when the outside temperature was 15° below zero. I never knew what temperature was maintained in the water of this apparatus, but as it was an open expansion tank system and the tanks were located only a few inches above the heating pipes, the temperature in the water could not have been high.

Water Tube Boilers.

At this time a great many water tube boilers were used. They were made of 1½-inch extra heavy wrought iron pipe put together with heavy gray cast iron fittings, and were of various forms and sizes to suit all manner of conditions. One of the most popular and efficient constructions was a boiler made in the same way as an old fashioned box coil. It was put together with open pattern return bends, and was brought together at the top and bottom by large headers or branch tees connected with right and left threads in the usual way. This boiler was made from 30 to 36 inches wide, 6, 8, or 10 feet long and about 4 feet high; the dimensions varying according to the capacity required. As it had a large amount of surface exposed to the direct action of the fire, and as almost all of this was horizontal or bottom surface, which the rays of heat, gases and other products of combustion came in contact with at right angles, it developed a very high rate of efficiency. However, it was hard to clean, and being incased in brick work, was difficult to get at for repairing.

Other Forms of Boilers.

Tubular boilers were also used. They were the familiar tubular construction, except that they were filled up with tubes to withim three or four inches of the shell. In practice this construction was not found as efficient as the water tube boiler. This was owing to the limited amount of direct fire surface and the large amount of flue surface. In order to make the tubes or flue surface effective, the grate surface had to be increased to such an extent that it was out of all proportion to the requirements as represented by the radiation, and in many cases the bottom rows of tubes were not effective. Then, again,

if for any reason it was necessary to force the fire, the gases escaping into the chimney were at a very high tem perature, representing considerable loss. It was also found that these boilers rusted out very rapidly during the season when they were not in use; and with light firing that the circulation in them was sluggish. While this type of boiler is still to a certain extent in use, it cannot, in my opinion, be said to represent the best practice. Other boilers were constructed of cast iron in various forms, all on the sectional principle. Some of them were quite effective, while others had grates altogether too large for the heating surface over them. The poor ones were sifted out and cast aside, while those possessing merit survived. But it is a strange fact that at the present time we find manufacturers who ought to be better informed rehashing some of the old cast aside types of sectional boilers and putting them upon the market as new constructions, only to have them fall by the wayside as time goes on. To be properly proportioned for hot water heating a boiler—or to be more correct, a heater—should contain from 60 to 75 per cent. of direct fire surface and from 25 to 40 per cent. of flue surface. In small heaters, say up to 4 square feet of grate, there should be 1 square foot of grate to every 20 or 25 square feet of heating surface.

Proportioning Boiler Surfaces.

In large heaters, up to 8 or 10 square feet of grate, the proportion can be much larger, say 1 square foot of grate to every 30 or 35 square feet of heating surface. The value of heating surface in its relation to amount of radiation supplied depends a good deal upon its arrangement in the heater and the way in which it is presented to the action of the fire and gases. With ordinary efficient surfaces, the grate area being proper, 1 square foot of heating surface in small heaters will take care of from 6 to 8 square feet of radiation, and in large heaters, from 10 to 15 square feet. Some years ago we used in lieu of modern radiation box and wall coils of various shapes. You are all familiar with their construction, and I have no doubt have put in many hard days' work making and testing them. It is in this particular branch of heating that great improvements have taken place. The modern cast iron vertical sectional radiator, being neat, compact and ornamental, is more in keeping and will harmonize better with a modern interior than the old style coils, though I think the latter more effective, foot for foot, than the former. For hot water heating efficient plain surface radiation only should be used. Extended surfaces are expensive and inefficient, and should not be used, especially if the apparatus is to be operated at a low temperature.

Kinds of Radiation.

There are three kinds of radiation in common use—viz.: Direct, indirect and direct-indirect. The last two named are used more especially for ventilation. In apportioning the amount of radiation required for any given exposure account must be taken of the temperature at which it is proposed to operate the apparatus, bearing in mind that the lower the temperature at which proper results can be obtained the better will be the quality of the heat and the greater the economy of fuel. I should recommend that a hot water heating apparatus be capable of maintaining a temperature of 70° during coldest weather, with a temperature in the water not to exceed 160°. Under those conditions a larger amount of radiation would be required than if a higher temperature were carried, but it would be more satisfactory to all parties concerned. The outside wall and glass exposures in any room or building exert the greatest influence in lowering the temperature therein, and for this reason they should be considered as the most important factors in apportioning radiation. The cubic contents also must be considered and good judgment used to ascertain how many cubic feet of air will have to be warmed per hour due to the change of air that may be effected through properly provided channels or through badly fitting doors and windows.

Apportioning Radiation.

The wall surface may be reduced to its equivalent in glass surface and the whole figured as so much glass, or each factor may be treated separately. The latter plan I consider best. In apportioning direct radiation to a given room, in which it is intended to maintain a temperature of 70°—and in the water of the heating apparatus, a temperature of 160°—it has been my experience that 1 square foot of radiation to each 60 cubic feet of contents, 1 square foot to each 2 square feet of glass and 1 square foot to each 8 or 10 square feet of outside wall will do the work properly. Great care must be exercised in judging as to the exposures, construction of the walls and fitting of doors and windows, together with any local conditions which might affect the result, and due allowance made. If a temperature of 200° be carried in the water the radiation may be decreased about 20 per cent.

To ascertain the amount of direct-indirect radiation required for any given room, the usual method is to ascertain the amount of direct radiation required, and to this amount to add 25 per cent. I have found under these circumstances that each radiator should have a cold air duct of an area in the ratio of 40 square inches to each 100 square feet of radiation. This duct should be brought through the wall a little above or below the radiator, so that it will make a right angle turn before entering the base of the radiator. It should also be accessible for inspection and cleaning purposes. Air can be delivered through a direct-indirect radiator at a velocity of about 3 feet per second.

Indirect radiation is usually apportioned by adding 50 per cent. to the amount of direct radiation required. This calculation would answer if wrought iron surfaces were used, but it is entirely inadequate for heating purposes if cast iron indirect radiation, taken at its commercial rating, is used. In such a case I should recommend increasing the amount required for direct radiation 100 per cent.; then the amount will not be found any too liberal.

Size of Air Ducts.

The warm air ducts from indirect radiators, if discharging upon the first floor, should be as near as possible 1¼ square inches in area for each square foot of radiation in the radiator to which they are connected. If discharging upon the second floor, 1¼ square inches in area to each square foot of radiation should be provided, and 1 square inch in area to each square foot of radiation if discharging upon the third floor. The cold air duct should be from 25 to 33 per cent. smaller than the warm air duct, and the radiator should be so incased that all of the incoming air will pass over every inch of the heated surface. There should be an air space above and below the radiator, that above being at least 20 per cent. larger than that below, and the lower space should not be less than three times the area of the cold air duct. The warm air should be discharged on the opposite end from that at which the cold air is admitted.

There is another factor governing the sizes of direct and direct-indirect radiators, upon which we have not touched—that is, as these radiators heat entirely by convection, warming the air to a given temperature, a certain quantity of air will be required to produce certain results, either in warming or ventilating. Under known conditions, the velocity of the air passing in at the air duct can be calculated, and the duct so proportioned as to deliver the proper quantity of air; then the radiating surface must be apportioned according to the amount of air it will warm per hour, regardless of its relation to the direct radiation, as before described. One square foot of indirect radiation at a temperature of 160° will heat 87 cubic feet of air per hour from zero to 70°. In order to attain this efficiency large amounts of air must be passed over the radiator. In large rooms where the air is changed from four to seven times per hour, even better service can be obtained. Indirect radiators should be arranged in groups as compactly as possible, and in connecting them with the mains they should be favored so as to maintain proper circulation with light as well as with heavy fires. A properly erected hot water heating apparatus, on heat being applied at the base of the column of water, will circulate uniformly throughout the system of piping and radiation. This circulation is due to the cold column of water descending and displacing the heated water, which ascends through the piping into the several radiators, where it is cooled and returned to the source of heat. The point at which the return mains are connected to the heater should be the base of the column of water, and the point at which heat should be applied.

Systems of Piping.

There are many systems of piping in use, and experience has taught us that they are all good under some conditions. The two-pipe system is possibly better known than most of the others. It consists of two mains—a flow and return. Sometimes they are carried direct from the heater to the different divisions of the work, and in such cases small pipe is used. At other times two large trunk mains are used, from which branches are taken to the different parts of the building. In this system the mains usually ascend from the top of the heater, rising about 1 inch in 8 feet, although it is quite common to cause the flow mains to descend from the top of the heater, venting the high point into the expansion tank. In such cases the extreme end of the flow main is connected through a small pipe into the return opening of the heater, and the return main commences at the point where the first connection is taken from the flow main and runs parallel to it around the basement, receiving the return connections in the order in which they are supplied from the flow main and returning them to the heater in the same order—*i. e.*, the first radiator supplied is the last returned to the heater, and the last supplied is first returned. The size of the

main is governed by the amount of radiation supplied. If it is long and exposed, 1 square inch in area should be allowed for each 100 square feet of radiation. If short and compact, the area of a 1-inch pipe will be found sufficient for every 100 square feet of radiation supplied.

When very large mains are used, trouble sometimes occurs through internal circulation in the main itself, and for this reason I would recommend that nothing larger than 5 or 6 inch pipe be used in any main. If greater area is required than this will afford, divide the work and use two or more 5 or 6 inch mains.

Overhead Piping.

The overhead system of piping is also much used. With it all of the water is carried in a large riser to the top of the building, where the main is distributed to different parts of the work, and descends to the basement through single drop mains called risers. The radiators are placed, as far as practicable, immediately above each other, so that they can be conveniently connected to one of these drop mains, both flow and return connections being at the same end of the radiator, the flow at the top and the return at the bottom; both are connected to the same drop main. No air valves are required, as all air is vented through the top connection of the radiator into the riser. The horizontal mains diverging from the top of the main riser descend about 1 inch in 10 feet, thus making this point the highest in the system of piping. Above it is located the expansion tank, connected with an expansion pipe from the bottom of the tank into the side of the most convenient horizontal main. A vent pipe is also taken from the extreme highest point in the main and connected with the side or top of the expansion tank above the water line. By this arrangement all air from the system is discharged into the tank.

It is not a bad plan, especially if the tank is located only a short distance above the main, to put it under a slight pressure and maintain an air cushion in it. Years ago it was the custom to govern this air cushion by a common ball cock, sometimes placed in the tank and at other times cased up at the side of it. In appearance it was not unlike an automatic water feeder. Of late years, however, automatic air valves have been used for this purpose, but it cannot be said that they properly answer the purpose or that they are reliable. In the basement the risers are connected into the side of the return main, which is carried around the basement and connected with the bottom of the heater. The area of the main in all its parts should be equal to the area of a 1-inch pipe for each 100 square feet of radiation supplied. Radiators may be tapped ¾ inch up to 40 square feet, 1 inch up to 70 square feet, 1¼ inches up to 125 square feet; larger than this, 2 inches.

Single Circuit System.

One of the oldest systems of piping used for hot water heating is known as the single circuit or one pipe system. It is exceedingly simple, and where suitable is very effective. It consists, as its name implies, of a single main, which, starting from the heater, is carried vertically as high as the ceiling will permit, then turned and carried as a horizontal main around the basement in a continuous circuit, having its highest point where it leaves the vertical pipe, and descending about 1 inch in 10 feet until it reaches a point immediately at the rear of the heater, where it drops and is connected with the return opening of the heater. If the heater is located in a position that is central to the work, two circuits may be taken from the vertical pipe and carried in opposite directions around the basement. Flow connections to radiators and risers are taken from the top of this main, and return connections brought into the side of it.

The expansion pipe from the bottom of the expansion tank should be connected with the bottom of the heater, and a circulating pipe taken from the top of the highest point in the main and connected to the side of the expansion tank below the water line. The size of the main for this system should not be less than 1 inch in area for each 100 square feet of radiation supplied, and it should not be reduced in size at any point. Air valves are necessary on all radiators. Up to 50 square feet radiators may be tapped 1 inch; up to 100 square feet, 1¼ inches; up to 200 square feet, 1½ inches; larger than 200 square feet, 2 inches.

In all work due provision must be made for expansion and contraction. To my mind a square elbow from the top of a main to lateral branches compensates better for expansion than a 45° elbow.

In the class of work under discussion theory furnishes us many valuable lessons, but I think one pound of practice is worth ten pounds of theory, and you, gentlemen, who are actively engaged in the practical details of the work have more and better opportunities to acquire a thorough knowledge of the art than any who depend upon books and theory entirely.

James D. Mowry.

James D. Mowry, for the past 15 years president of the W. H. Page Boiler Company, died at his residence, 256 Broadway, Norwich, Conn., last week, after a sickness of several weeks. He was an old and respected citizen and had in his long and memorable life been identified with many local enterprises. He had been agent of the Chelsea Mills and of the Rockland Mills prior to 1865. He started the Mowry Machine Company, was for years secretary of the Page Wood Type Company, and finally their president. In 1857 he took an active part in arranging for the bi-centennial celebration of the settlement of the town, and was a member of two committees that contributed to the success of that memorable event.

He was a loyal citizen and during the dark days of the Rebellion did what he could to promote the cause of the Union. At the opening of the war he was a member of a committee for the raising of a war fund. In 1862 he contracted to furnish the Government with 30,000 rifle muskets of the latest Springfield construction. The barrels were made at Cole & Walker's, Franklin street, the locks by C. B. Rogers & Co., and the other pieces at Mowry's factory in Greeneville. In 1854 he was the leader in the movement to connect Greeneville and Preston with a bridge, and as the result of his labors witnessed the erection of the first bridge across the Shetucket River at that point.

He was a member of Somerset Lodge No. 34, F. and A. M., and a member of the Elms Club. He was a man of kindly disposition and pleasing personal qualities, and was highly esteemed by those who knew him. Mrs. Mowry, his daughter, Mrs. Frederick T. Mason, and his son, Col. William C. Mowry, survive him.

HEATING NOTES.

The McCormack Steam Heating Company, Wallingford, Conn., lighted their building with electricity last week for the first time. The plant was put in by the Standard Storage Battery Company of Northford and is said to give satisfactory results.

Samuel Burns was a caller at *The Metal Worker* office this week. Mr. Burns is secretary and manager of Thomas W. Weathered's Sons, 139 Centre street, New York, manufacturers of hot water boilers and greenhouse constructors.

A patent has been granted to C. A. Ball, Washington, D. C., for a radiator so constructed that only such proportion of the radiating surface may be used as is necessary for the work, special valves and diaphragms securing the result.

The Connecticut State Board of Health have adopted a plan for ventilating the State Prison and the work of installation will be done by the inmates.

In commenting on heating greenhouses, using gas for fuel in a hot water heater, Thomas Fletcher makes the following statement in an English journal: "A span roof house, protected from winds, size 20 feet square, 12 feet to ridge, required, in one year, a total gas consumption of 34,000 cubic feet to maintain a minimum of 45° with a hot water system. It is quite out of all question to expect to heat a good sized conservatory with gas for anything approaching three times the cost of coke. Under equally good conditions as regards economy, 1 pound of good dry coke is equal to 19 cubic feet of 18 candle gas, and at the prices paid here—*i. e.*, 4 shillings ($1) per 1000 cubic feet, this quantity of gas would cost 1 penny. At its present price, 13 shillings ($3.25) per ton-coke would cost one-fourteenth part of this, and although in practice the figures would come out much more favorably for gas fuel, the difference would still be prohibitive, except on the smallest scale."

George C. Blackmore of the United States Radiator Company, Saltsburg, Pa., called at *The Metal Worker* office this week.

The Vosburgh cast iron patent adjustable floor thimble and ceiling plate combined is the subject of an elaborately decorated poster issued by the N. O. Nelson Mfg. Company, St. Louis, Mo., who make it. The poster, measuring 11 x 15 inches, is printed in colors and in a circular panel in the middle is a view of the Vosburgh thimble in place. The only text relating to it is: "No argument is necessary. It speaks for itself." On the back of the poster are prices of the No. 1 and No. 2 sizes. The former has a range of from 9 to 16 inches and the latter of from 15 to 22 inches. The device is made for all sizes of pipe from ¾ to 4 inches.

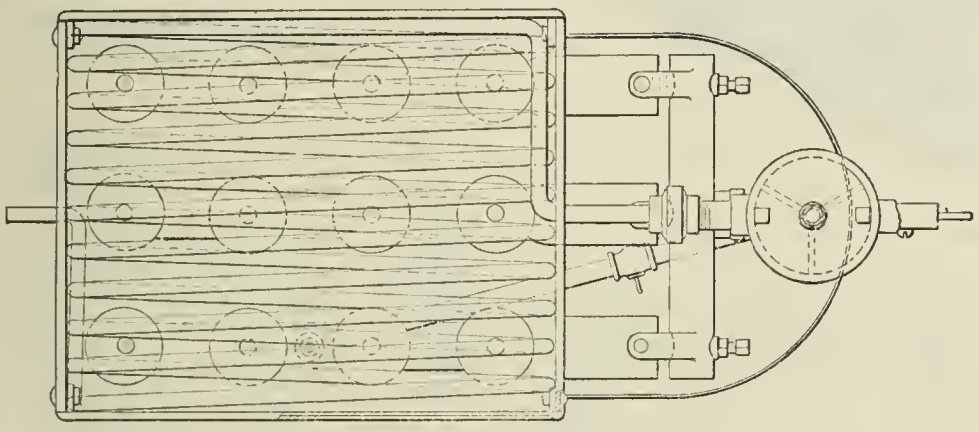
The John W. Mills Company, 100 Lake street, Chicago, are to move to 93 on the same street, having secured a portion of the showroom occupied by the Niagara Radiator Company.

C. B. Matteson, manager of the Chicago office of the J. H. McLain Company, has resigned his position with the above company, and is to enter the employ of the American Boiler Company as city salesman.

PLUMBING and GAS FITTING.

Clarke's Instantaneous Water Heater.

Those who cook with gas and others who require hot water, particularly in summer, will be interested in Clarke's instantaneous water heater, the patents for which are controlled by the Gilbert & Barker Mfg. Company, 82 John street, New York, who are just putting it on the market. It is designed to completely take the place of the range water back and kitchen boiler. It may



Clarke's Instantaneous Water Heater.—Fig. 1.—Plan View.

be placed at any convenient spot in the cellar kitchen or elsewhere and connected with the cold water supply to the building. The hot water service may then be run the same as from a boiler to all of the fixtures in the house where hot water is required. It has been tested in connection with a water service carrying 125 pounds of pressure, with the water supply at 40°, and furnished water at 130° temperature at the rate of one gallon per minute. Fig. 1 shows a plan view of the heater with the heating coil with the burners under it and the controlling valve, which is one of the features of the heater. Fig. 2 shows a longitudinal sectional view of the heater and the valve construction. The general adaptability of the heater is largely due to the fact that gas is burned only when water is being drawn. The gas is turned on or off by the mere act of drawing water. The valve arrangement, shown in Fig. 2, is like a direct acting steam pump. At one end is a cylinder, containing a piston actuated by the flow of water. The water from the supply is admitted under the piston and taken out above it. When a faucet is opened anywhere on the hot service, whether it be close to the heater or hundreds of feet away, the flow of water instantly raises the piston. At the other end of the piston is arranged a direct acting gas valve which opens immediately on the piston being raised by the water and lets on a full supply of gas to the burners under the heating coil, where a pilot light instantly flashes the burners into use. The coil is made of 32 feet of ½-inch seamless drawn copper tubing and is placed in an iron case 12 inches wide, 15 inches long and 10 inches high. The heater is 30 inches long, including the valve, and stands 15 inches high.

Since the bind of the stuffing nut under the piston will vary with the pressure of the supply on different floors of a building, a counterpoise is furnished which can be set at any required point on the valve lever to aid in closing the valve when a faucet is closed. The variation of quality and pressure of gas in different towns and on different floors of a building is anticipated, and needle valves are provided, which may be adjusted by hand when the heater is installed. By this arrangement a sufficient velocity and quantity of gas is secured to induce a proper amount of air to enter the bell-shaped atmospheric burner chamber. The quantity of water drawn can be reduced by the user at the faucet, so that water at a much higher temperature than that mentioned can be obtained. By reducing the quantity drawn it remains in the heating coil over the burners a longer time. When used in public places, like barber shops, hotel washrooms, &c., the temperature and quantity of the water drawn can be regulated by placing a stop cock on the supply to the heater and setting it, as found satisfactory by experiment. The burner is divided into three sections, each having four flame jets burning 10 feet of gas apiece when the burner is in full operation. With this heater it is claimed that hot water can be secured promptly at any time of the day or night in such quantities as desired. It is also pointed out that no large body of hot water is stored in a boiler to give an uncomfortable temperature to the apartment in summer. It is claimed that it is far more economical to heat the water wanted as it runs and then stop the use of fuel than to store a quantity of boiling water to waste a large percentage of its heat continually. The comfort derived from cooking by gas in summer has led to many kitchens being heated by some other means than the cooking apparatus so that gas may be used in the winter. It is claimed that the difficulty in securing hot water under such conditions is overcome by the Clarke hot water heater.

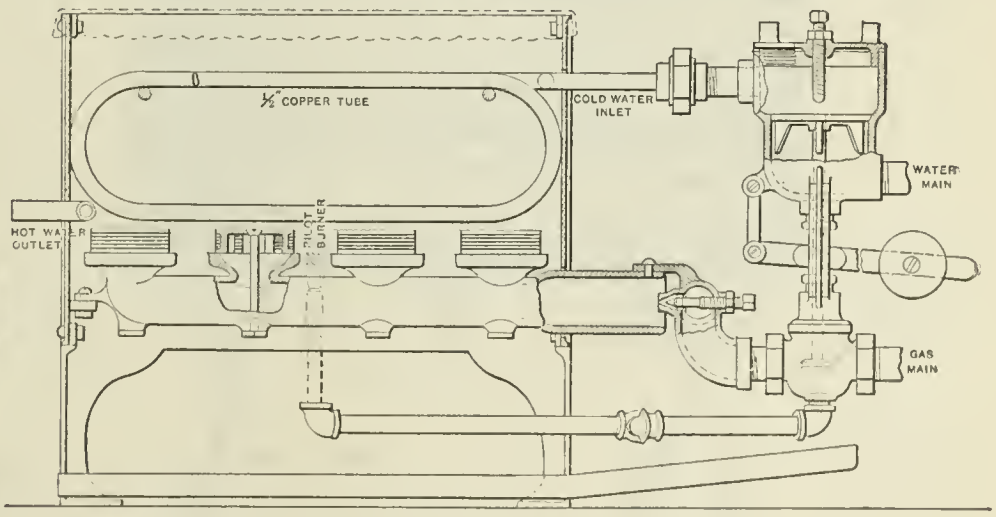


Fig. 2.—Sectional View.

Association News.

Connecticut Plumbers' Association.

President J. B. Weiant of the Connecticut Association of Master Plumbers has appointed the following committees for 1895:

Sanitary Committee: Robert Morgan, New Haven; F. A. Curtiss, New Haven; H. B. Middlebrook, Bridgeport; John M. Page, Naugatuck; S. H. Beard, New Britain.

Legislative Committee: J. S. Craig, Hartford; James Ahern, Hartford; James F. Duffy, Hartford; James Donovan, Middletown; Lyman D. Mills, Middletown.

Essay Committee: L. H. Mills, Bridgeport; A. Troland, Norwich; J. G. Shearlock, New Haven; Wm. Vanderman, Willimantic; G. W. Washburn, Danbury.

Apprenticeship Committee: S. E. Dibble, New Haven; Thos. D. Barlow, Waterbury; Francis J. Reynolds, Ansonia.

THE MASTER PLUMBERS' ASSOCIATION of Augusta, Ga., held a meeting last week and was addressed on the subject of "Sanitary Plumbing" by Health Officer Christman. The latter invited a committee of the association to meet the Board of Health at its next meeting, and the Sanitary Committee, consisting of Lewis Willenbecher, F. E. Whitesell and E. B. Evans, was delegated for

this purpose. The Plumbers' Association has become a member of the National Association of Master Plumbers, has adopted a constitution and by-laws and will hereafter meet in Seagreaves' Hall, North Sixth street.

A NUMBER of Nebraska plumbers met recently at Lincoln and organized the Nebraska Master Plumbers' Association. The following officers were elected: President, James H. O'Neill, Lincoln; vice-president, John Rowe, Omaha; secretary, H. H. Gaffey, Lincoln; treasurer, B. C. Humphrey, Fairbury.

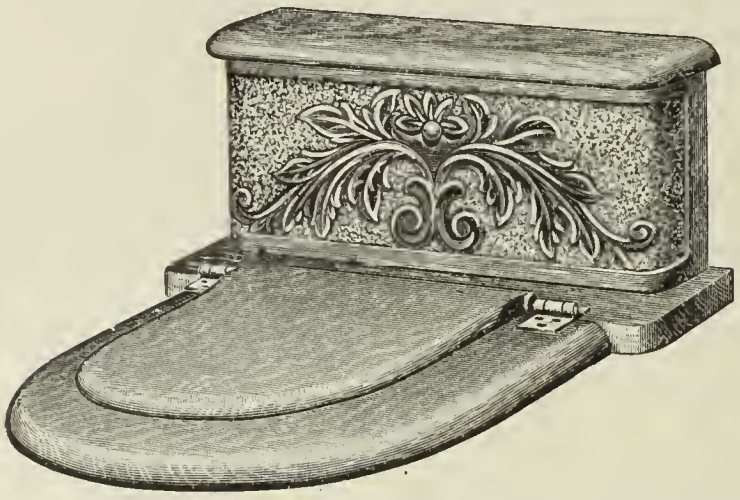
JOHN MITCHELL, president of the National Association of Master Plumbers, will respond to the toast "The National Association" at the banquet after the convention of the New York State Association of Master Plumbers, at Troy, N. Y., next week.

NEW YORK CITY will send a delegation of 14 plumbers, headed by President McDermott, to the State convention of master plumbers at Troy, N.Y., on March 5 and 6.

BIRKERY MFG. COMPANY, Hartford, Conn., manufacturers of the well-known Birkery ball cock, are distributing to their friends a very neat pocket match safe made of seal leather, and they advise us that any master plumber who may have been unavoidably overlooked and will send them a postal card will receive one by return mail.

High Grade Closet Fixtures.

Our illustrations show some of the many high grade seats and tanks for water closets. made by the Pfau Mfg. Company, 138–142 Hunt street, Cincinnati, Ohio. Fig. 1 shows the hand carved closet seat, and Fig. 2 the Roman pattern flush tank. These fixtures are furnished in different woods, light and red cherry, natural and antique oak, ash and walnut, all of which are made with a high grade finish, being water rubbed and given a piano finish. The closet seat is furnished with a back handsomely carved by hand and has finely nickle plated hinges. It can be supplied with or without the seat cover as preferred. The flush tank is provided with heavy polished or nickle plated brass brackets and a fine chain and pull. The tanks are made in three sizes, No. 0 being used as automatic tanks, No. 1 for use with washout and hopper closets and No. 2 for siphon jet closets. Several different styles of valves are mentioned as adapted for use with the tank from which the plumber can make a selection.



High Grade Closet Fixtures.—Fig. 1.—Showing the Hand Carved Closet Seat.

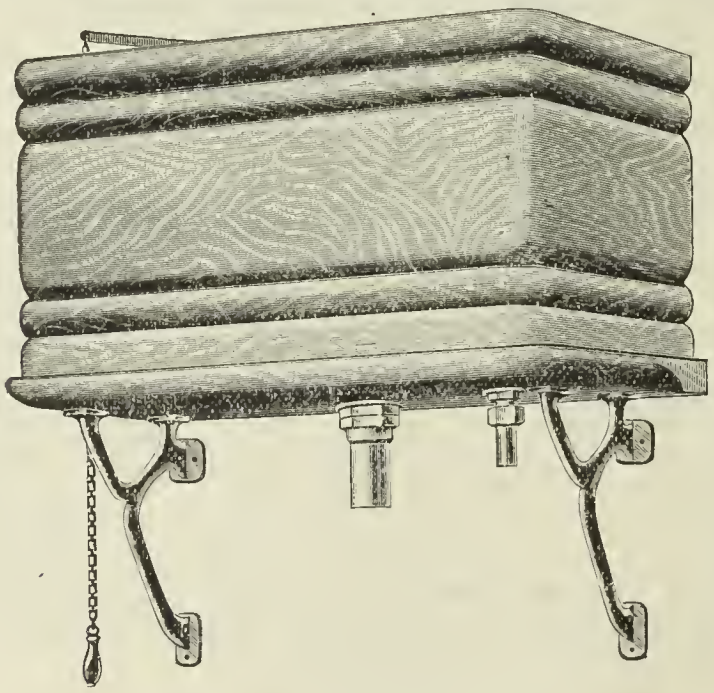


Fig. 2.—Roman Pattern Flush Tank.

A NEW and attractive business sign now appears over the door of 129 Beekman street, New York, which announces that A. Keller is conducting the business of stoves, French ranges, plumbing, steam and gas fitting, he having bought out the interest of his former partner.

TRAPS AND VENTS.

THE New York *Tribune* suggests that there exists a need for a water insurance company, to insure against damage done by bursted water pipes, whether caused by freezing, poor material or natural wear and tear.

BROWN BROS. have leased a store in the Barnard Block, Saginaw, Mich., which they will use for a plumbing establishment.

GEORGE MORLIDGE has opened a plumbing shop at 633 York street, Newport, Ky.

JOHN A. JACKSON is building a plumbing shop for Curran & Murray, at Baker and School streets, Morton, Pa.

ROBERT CLARK and THOMAS ELDER are preparing to open a plumbing establishment in the basement of the Howarth Building, on Seventh avenue, Beaver Falls, Pa.

WM. C. LOVE, Haverford, Pa., sustained a loss in his plumbing shop by fire of $2500, partly covered by insurance.

GEORGE F. HICKMOTT, for a number of years connected with the plumbing and metal trades and for some time past a dealer in plumbers' specialties and sheet metals at 152 Federal street, Boston, Mass., has associated himself with the Birkery Mfg. Company, Hartford, Conn., and will continue to visit the trade in the interest of the Birkery ball cock and several other specialties with which he has been identified. Mr. Hickmott is well and favorably known in this line and will have a hearty welcome in his new capacity.

COUNCILMAN TIMOTHY BRONSFIELD has opened a plumber's shop on Delaware street, between Fifth and Sixth streets, Leavenworth, Kan.

A LAW putting plumbing under the control of the Board of Health has been presented to the Legislature of the State of Delaware.

JOHN H. CABEEN, 38 Church street, Boston, Mass., had his plumbing establishment flooded by water thrown on a fire in an adjoining building.

T. F. BOHAN, Little Falls, Minn., has moved his plumbing shop to First street.

R E. HARRIS has purchased the old electric light building on East Calhoun street, Macomb, Ill. He will move his present building to the rear of his new purchase and occupy the entire space as a plumbing and steam fitting shop.

R. T. ALLEN, Bangor, Maine, has sold one half interest in his plumbing business to Robert D. Linn of Old Town.

ABEL P. RANDALL, Westerly, R. I., for many years with Robert Drysdale, will begin the plumbing business for himself March 1.

AT THE ANNUAL MEETING of the Bridgeport, Conn., Builders' Exchange, Zalmon Goodsell was elected president and Lucius H. Mills treasurer. Among the other members of the exchange who are plumbers are C. S. Eames, M. W. Manwaring, Edwin A. Creevey, F. & F. C. Booth, John Kearns, E Lynch, Pierce Mfg. Company, Green & Logan, Wheeler & Cook, H B. Middlebrook and Donahue & Bertilson.

THE BRIDGEPORT STEAM HEATING COMPANY, Bridgeport, Conn., are a well equipped plumbing supply house and have a large warehouse. They carry a

complete stock of water closets, urinals, bathtubs, lead pipe, drain pipe, steam and gas fittings, &c., and cut pipe to sketch. A new boiler and engine have been put in to supply the power needed.

THE PLANT of the Sperry Sewer Pipe Company. Akron, Ohio, has been sold to Harry Thompson, of that city.

THE NEW YORK STATE SEWER PIPE COMPANY of Rochester, N. Y., were incorporated on February 25, with a capital of $20.000. The directors named are W. H. Garsline, Ira L. Otis, Ed. W. Peck and Frsnk H. Kondolf of Rochester.

THE OPERATIVES on sanitary ware in the shops of the Trenton potteries are taking steps to resist the newly posted reductions in wages, which they say range fiom 25 to 50 per cent. A committee has been appointed to confer with the manufacturers in the hope that an agreement may be arrived at.

PLUMBER'S LICENSE has been taken out by William Nedvideck, 216 S. Third street, La Crosse, Wis.

THE plumbing and heating establishment of Hulett & Hsy, at No. 203 Sixth street, Rscine Wis., was visited by a $200 fire recently.

THE KALAMAZOO PLUMBING & HEATING COMPANY have begun business at 111 North Rose street, in the Chase Block, Kalamszoo, Mich. Fred. Herman will have charge of the plumbing department, Andrew Frey of the steam heating and E. S. Shepard of the office and general supervision.

C. L. HICKS, Waterbury, Conn., had a $1000 fire in his plumbing shop, which was covered by insurance.

DAVID J. MCKEOUGH has tendered his resignation as plumbing inspector to Mayor Gibson of Utics, N. Y., to take effect at the pleasure of the Board of Health. Joseph Frank, at present assistant inspector, is a candidate for the vacancy, and it is understood that his chances for the appointment are good. Mr. McKeough and his brother Thomas F. have engaged in the plumbing, steam and gss fitting and hot water heating business at 41 Columbia street, corner of Broadway.

WALTER N. FOSS of Augusta, Maine, a practical plumber and steam fitter, has connected himself with the firm of Sturtevant & Haseltine of Pittsfield, Maine, and will attend to that department of their business.

WILLIAM BISHOP'S SONS, 205 South street, New York, publish an illustrated catalogue calling attention to the many specialties which they manufacture and handle. Particular attention is given to William Bishop's patent pump water closets for use in vessels, either above or below the water line. Various closets are shown, likewise other ships' fittings, such as pumps, sea cocks, basins, deck plates, &c. As an indication of the extent of their business, they mention that in the past year they have supplied fixtures for and done work on over 400 naval vessels, steamboats, ferry boats, pilot boats, steam and sail yachts, beside doing a good deal of house plumbing.

THE WELL KNOWN FIRM of Hughes & Stephenson, Montreal, Canada, after a very prosperous business career of 16 years in the plumbing and heating business, have dissolved by mutual consent. They succeeded Richard Patton on his death, and the business, therefore, has been carried on without interruption for over 30 years. W. A. Stephenson retires from the firm and the business will be continued by J. W. Hughes, whose name will be familiar to our readers as a contributor to the columns of *The Metal Worker* for many years past. Mr. Hughes will have the valu able assistance of his son W. R. J. Hughes in carrying on the practical department. Mr. Hughes, Jr., besides having served a iegular apprenticeship at the trade and worked for several years as a journeyman, has had the additional advantage of a course in the New York Trade School, and is thoroughly familiar with modern methods of plumbing and practical sanitation.

A SERVICEABLE ARTICLE for desk equipment, in the shape of a glass paper weight, is being distributed by the E. Stebbins Mfg. Company of Brightwood, Msss. The paper weight is of glass and the possessor will have constantly before his eyes the reminder that when he has to do with plumbing work he should use Stebbins' Special faucets.

THE STRIKE of the workmen at the pottery of the Western Ssnitary Pottery Company, Tiltonsville, Ohio, has been settled, the demand of the employers for a reduction of 25 per cent. on the ssnitary pottery wage scale being withdrawn. The plant has been idle for some months, but about 3 weeks ago the management offered to resume operations if the men would accept the reduction referred to. The proposition was refused by the workmen, who went on strike. The plant is again in full operation.

UNDER the name or style of the Newell-Booth Company, Limited. A. T. Bootb, for many years with the Haines, Jones & Cadbury Company, manufacturers of plumbing supplies, Philadelphia, and Wm. H. Newell, also for many years connected with the same concern, but latterly engaged in business on his own account as a manufacturer of plumbers' specialties, have commenced business in the same line at the corner of Broad and Buttonwood streets, Philadelphia, in the building lately occupied by the Hook Smelting Works. The upper portion of the building has been utilized for their foundry, finishing shops and stock rooms, while the ground floor contains their showroom and office. The company propose to csrry in stock a full line of plumbing supplies, and will manufacture and introduce as soon as possible a few specialties for which their experience has taught them there is an opening. In a circular recently sent out to the trade the company pledge themselves to sell to the trade only. The new concern enter the market under favorable circumstances, and should very soon attain a prominent position in the business.

THE DAVIS & STEVENS MFG. COMPANY, Seneca Falls, N. Y., have just added a new specialty to their business in the manufacture of a new gas machine for regulating the burning of natural or artificial gas.

NOTICE IS ISSUED to the trade by George F. Bishop and James G. Bishop that under the firm name of William Bishop's Sons they are carrying on the business established 35 years ago by their father, the late William B shop. They have a branch store at 724 Third avenue, Brooklyn, and their main store and shop is at 205 South street, New York. They carry in stock a full supply of the latest msrine sanitary specialties and fittings and are in position to do ship plumbing woik of all kinds. The firm are also coppersmiths and steam fitters. In the circular which they issue attention is called to the ships' closets which they have put in various boats, their No. 1 Naval Closet being used in the United States Navy, and they give a list of a number of ships in which they are employed. They also refer to other closets and mention the names of many well-known yachts and vessels carrying them.

B. T. STEWART of Skowhegan, Maine, has made airangements to go into the plumbing business at Pittsfield, Maine.

A SIGN on tbe building at 5 East Nineteenth street, New York, proclaims that the Meyer Sniffen Compsny, Limited, will make a fine display of handsome plumbing fixtures as soon as the showrooms can be fitted up. Their line of modern sanitary goods has many attractions, and a visit to their exhibition, when completed, will doubtless prove pleasing and profitable to the plumber.

THE MASTER PLUMBERS' ASSOCIATION of Montreal, Canada, held their first annual banquet February 25 at the Queen's Hotel, about 150 membeis being present. The dinner was to celebrate the insuguration of the association and to emphasize its gratification at having received its act of incorporation. President Lamarche filled the chair in a most able manner and in a characteristic speech, or rather speeches, for he spoke in both French and English, in acknowledgment of the toast to the association, gave an account of the aims and wishes of its members, which include the promotion of good plumbing, the furtherance of the public health and the education of the people to the necessity of proper sanitation. At the left of the chairman was Acting-Mayor Alderman Leclerc, who is himself a "knight of the ladle and cloth," and on his right was Alderman Beausoleuil, chairman of the Board of Health, who in the course of an able speech promised the master p'umbers the aid and co-operation of the board. Speeches were likewise made by representatives of the leading manufacturing and supply houses of the Dominion, who promised cordial assistance to the association. Music was a feature of the banquet that was much appreciated.

THE DOLLAR GAS BILL before the New Jersey Legislature has been defeated.

DAYTON & CO. of Clinton, Iowa, have arranged for opening a plumber's establishment at Savanna, Iowa. They have rented the Bowman Building and will do all kinds of plumbing, gas and steam fitting, and keep a full line of supplies of all kinds.

WILLIAM B. GILCHRIST has purchssed the interest of his partner in the plumbing business at Wilkes-Barre, Pa.

THE BOSWORTH HEATING & SUPPLY COMPANY of Hartford, Conn., have changed their articles of association so as to enable them to deal in manufacturers' and engineers' supplies and all kinds of merchandise and machinery used by steam fitteis, gas fitters and plumbers.

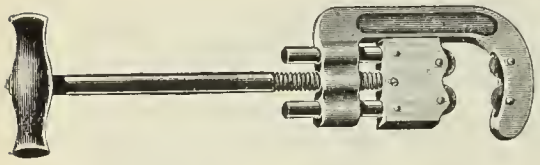
SAMUEL S. SINGLETON, a plumber and hardware merchant of Middletown, Conn., died last Tuesday of heart disease. He was 70 years old. He leaves a wife and one daughter.

DEAN WILSON, Chief Inspector of the Bureau of Plumbing, Buffalo, N. Y., says his crusade against plumbers

who had no license, or had failed to obtain a certificate of qualification, has been successful. He also says: "I don't want people to think that Buffalo plumbers are not as competent as any, for they are. They do as good work, generally, as is done in the United States, and the reputation of this city for good sanitary plumbing is excellent. The best plumbers, the leading men in the business, do all they can to assist in enforcing the regulations, and they greatly aid this department. If they didn't, we couldn't do the work cut out for us."

Four-Wheel Pipe Cutter.

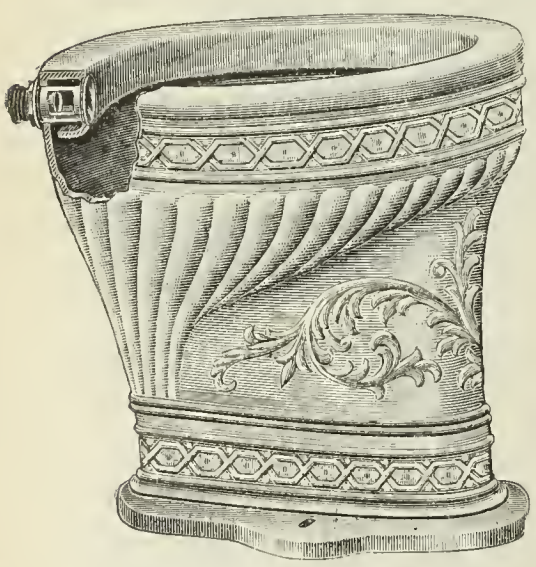
The accompanying illustration shows a new form of pipe cutter brought out by the Vanderman Plumbing & Heating Company of Willimantic, Conn., and sold under the name of the Vanderman four wheel pipe cutter. The construction and operation of this tool are clearly shown in the illustration and no further description is necessary. The cutter is especially adapted for cutting cast iron soil and water pipe. It is made in three sizes, No. 1 being adapted to cut from 2 to 4½ inches, No. 2 from 2 to 6 inches, and No. 3 from 4 to 10 inches.



Four-Wheel Pipe Cutter.

The Hornless Water Closet.

The accompanying illustration shows a new form of closet made without a horn. The coupling passes entirely through the closet rim to the inside of the closet. The threads are in the middle, the outside nipple and lock nut being in one piece, so the same length is always attained. The frequent breaking of horns is what led to the invention of the closet by Thomas Kelly & Brothers, 124 Franklin street, Chicago, Ill. The date of the patents which have been allowed in the United States and Great Britain and are about to be issued is March 5, 1895.



The Hornless Water Closet.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

AN OMNIBUS APPROPRIATION BILL before the Minnesota Legislature provides $5000 for heating the Mankato School and also provides for the erection of two new school buildings.

BIDS will be received at the office of the Commissioner of City Works, Brooklyn, N. Y., until March 6, 1895, for plumbing work in connection with the alterations and repairs to be made in the offices of the City Hall now occupied by the Controller, Auditor and Board of Audit.

BIDS will be received at the office of the Commissioner of City Works, Brooklyn, until March 6, 1895, for furnishing and fitting up a steam heating apparatus in the Twentieth precinct police station house, &c., on the northeast corner of Hamburg and De Kalb avenues.

SENATOR PALMER has introduced a bill in the Connecticut Legislature to appropriate $5000 for heating and ventilating the New Britain Normal School.

A LARGE RAILROAD DEPOT is to be built at La Junta, Col., which is to have a heating and a plumbing system.

GEORGE SAUNDERS, Andover, Mass., has received the contract for ventilating the Musgrove Block, according to plans laid down by the State Inspector.

THE CONTRACT for plumbing the F. A. C. Club House, Fitchburg, Mass., has been let to John B. Farnsworth of Leominster, who did the plumbing for Lockey & Mayo's new block in Leominster. The contract calls for annealed brass tubing throughout and provision is made for a continuous hot water circulation.

W. H BARTHOLOMEW, New Haven, Conn., is to build a handsome residence to have a modern plumbing system and a hot water heating plant.

THE FOSKETT & BISHOP COMPANY, New Haven, Conn., have recently received contracts for placing Bolton hot water heaters in the residences of Hon. John F. Dillon, Far Hills, N. J.; C. A. Singer, Larchmont, N. Y.; Hon. W. Z. Larned, Summit, N. J.; Chas. P. Thompson and Geo. Stelzle, New Haven, Conn.

JAMES T. KAY, Meriden, Conn., is finishing up the heating of the new Center School. A new Economizer boiler, manufactured by the Porter Mfg. Company of Syracuse, N. Y., has been put in. Mr. Kay will also soon finish the plumbing and heating of the new Curtis Home. The plumbing is done in an elaborate manner, the best fixtures of the J. L. Mott Iron Works being used, with enameled baths and sinks, and everything in the most approved modern style.

KEEFE BROTHERS of Oswego have begun the work of heating and plumbing in the new hotel at Pulaski, N. Y.

WHITAKER & DUNLAP, Littleton, N. H., have received the contract for the plumbing in the new school house.

THE New Haven, Conn., town meeting, held last week, authorized the City School District, says the New Haven *Record*, to borrow a sufficient sum to make the amount available for new schools $180,000--$90,000 for the Grand Avenue School, $80,000 for the George Street School and $10,000 for the enlargement of the Winchester School.

THE KALAMAZOO PLUMBING & HEATING COMPANY, Kalamazoo, Mich., have the contract for plumbing and fitting the new Craver Block.

THE PLUMBING CONTRACT for School No. 7, at Rochester, N. Y., has been readvertised owing to some misunderstanding of the original bidders. The siphon closet of the J. L. Mott Iron Works has been specified.

A MASCOT STEAM HEATER, made by the United States Boiler Company, Detroit, Mich., is being put into the Ursuline Academy, at Santa Rosa, Cal.

THE HEATING APPARATUS at Hanover Park, Meriden, Conn., by which both the Casino and the merry-go-round buildings are heated, has given the most satisfactory service during the severe weather of the past few weeks. Both buildings are heated with steam. The plant was installed by Taylor & Taylor of Meriden, Conn.

A. D. WARD, Augusta, Maine, has completed the plumbing and heating plant in the Hill, Macomber & Wright Block.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until March 22 for work, including the roof construction and roof covering for the United States Court House, Post Office and Custom House at Sioux City, Iowa. Drawings and specifications may be had from the Supervising Architect, Washington, or from the Superintendent at Sioux City.

THE L. H. PRENTICE COMPANY, 203 and 205 Van Buren street, Chicago, are to install a steam heating and power plant in the Mooney & Brisbane Building, at Main, Washington and Clinton streets, Buffalo, N. Y.

THE CHARLES H. SIMMONS COMPANY, 72 Market street, Chicago, have the contract for steam heating in the tenth to thirteenth floors of the Y. M. C. A. Building, 153 to 157 La Salle street.

KROESCHELL BROS. COMPANY, 41 to 59 Erie street, Chicago, have the contract for steam heating in the flat building of Philip Binne, North avenue, between Wells street and La Salle avenue.

THE SMITH & ANTHONY COMPANY, 219 Lake street, Chicago, have the contract for warm air heating in the flat building of Dr. Crissman, North Clark street.

SMITH & DONEY, 1046 North Western avenue, Chicago, have the contract for the plumbing and drainage in the flat building of W. Bubonon, Elston and Redfield avenues.

FRANK J. RUH, 1204 Diversey street, Chicago, has the contract for the plumbing and drainage in the residence of L. Mallern, 587 Orchard street.

JOHN WATSON, 1284 South Trumbull avenue, Chicago, is to do the plumbing and sewerage in the flat building of James Crosby, 1095 South Oakley avenue.

WILLIAM READ, 345 Forty-third street, Chicago, is to do the plumbing and drainage in the two store and flat buildings of C. Fiend, Fifty-first and Justine streets.

JAMES J. DOYLE, 6040 South Halsted street, Chicago, is to do the plumbing and drainage in the flat building of A. Smith, 3232 Fifth avenue.

TIN PLATES.

Is Overproduction in Sight?

A well informed correspondent in one of the Western States, who is largely interested in the American tin plate industry, has favored us with his views in regard to the prospects before the manufacturers of tin plates in this country. He gives as his impression, based upon rough calculations of productive capacity and consumption, that by the end of the current year the domestic manufacturers will have to face a strong home competition, caused by an overproduction of about 30 per cent. This theory is sufficiently startling at this early stage in American tin plate making, and it is deserving of some consideration.

The premises from which our correspondent deduces his statement, as given by him, are briefly these: The total consumption of tin plates in the United States is 6,000,000 boxes a year. The Standard Oil Company, the largest individual consumers, use 900,000 to 1,000,000 boxes a year, upon which they are allowed a rebate of 99 per cent. of the duty. This places them beyond the reach of the American manufacturer. The Pacific Coast trade amounts to between 500,000 and 1,000,000 boxes a year, which the Americans cannot touch on account of freight rates, the English manufacturers being able to ship so much cheaper by water. The dressed beef men who ship abroad are also entitled to 99 per cent. rebate on their shipments of foreign material, and they prefer buying foreign tin, owing to the fact that having both foreign and domestic tin plates in their factories would necessitate so many certificates, oaths, &c., to convince the Government that they are consuming imported tin only for their export business that they prefer to use foreign material altogether. Thus, all told, there are at least 2,000,000 boxes of tin plates consumed here every year which, it is argued, will always belong to the Welsh trade; at least until the conditions in this country approximate those obtaining on the other side. Accordingly, he estimates, only 4,000,000 boxes, in good years, are left to be fought for by American manufacturers.

Our correspondent calculates that there are at present mills enough in operation and in process of erection to make from 5,000,000 to 6,000,000 boxes per year. Consequently, he concludes, by the end of this year, the American manufacturers will have to face a home competition of an overproduction of 30 per cent. With this in view, he sees nothing encouraging to our domestic tin plate makers in the outlook, even if the building of new tin plate plants does not go beyond those already under contract.

It is difficult to estimate with any degree of accuracy the aggregate capacity of the tin plate works now in operation or in course of erection in this country. But, so far as we have been able to judge from a necessarily rough calculation, based upon reports of the proposed capacity of the new works now in process of construction—and these reports seldom err in the direction of under-estimation—their capacity, together with those of the existing works, will most probably not exceed the lower figure quoted by our correspondent—namely, 5,000,000 boxes per annum—and that only if the entire capacity was in constant employment.

Taking the other estimates presented as approximately correct, this would leave a possible surplus production of American plates amounting, in a good consumptive year, to about 1,000,000 boxes. But it is not unlikely that the figures given for the consumption that must for some time remain out of reach of the home manufacturers are rather above the mark. So far, at least, as they relate to the proportion of imported plates used in the oil and packing industries and re-exported, with the benefit of rebate of duty, in the form of cans, the estimate appears to be too high. Inquiry among the leading tin plate importing houses in this city, and consultation with one of the best informed individuals in the country in regard to the oil and canning trades, lead us to the conclusion that, at the outside, not more than 1,500,000 boxes of tin plates are re-exported yearly, including the greater part of the tin used on the Pacific Coast. This latter amount, which our correspondent places at between 500,000 and 1,000,000 boxes, cannot much exceed the lower figure. Last year's imports at San Francisco, according to the Custom House returns of that port, were only 213,000 boxes.

Moreover, the estimate of 6,000,000 boxes total consumption of tin plates in the United States in a good year, appears to be a decidedly low one. We have before us the record of tin plate imports for the past ten years, which shows that in the years 1889, 1890 and 1891 the numbers of boxes of tin plates brought into this country, calculated on a 14 x 20 full weight basis, were 6,733,840, 6,362,160 and 6,502,900 respectively. Last year, which was an exceptionally bad one for the tin plate trade, the imports reached 4,537,580 boxes, to which must be added about 1,200,000 boxes manufactured at home, making about 5,700,000 boxes entered for consumption during a period of unusual trade depression. As very small stocks were held at the close of the year, we should place a good year's consumption at nearer 7,000,000 than 6,000,000 boxes. Calculating on this basis, the overproduction claimed by our correspondent would be eliminated, and a sufficiency of trade would be left for all the American manufacturers, provided—and here comes the real difficulty—they are at the time producing the material called for by American consumers in proper quantities and proportions.

While we do not believe that the American tin plate works will be turning out a surplus of high grade bright charcoal plates, or even of ordinary coke tins by the close of this year, there does, however, seem to be some danger of their overdoing the roofing plate business. According to the latest published returns, the terne plate output of the United States comprised nearly 45 per cent. of the whole, a proportion which, if continuously maintained, would shortly entail a large surplus production of this class of plates. But the good sense and sound judgment of the American manufacturers may be relied on to avoid any such unwise proceeding.

A Modern Tin Plate Plant.

Many misleading and unauthorized statements have recently been made concerning the nature of the improvements and additions to the plant of the New Castle Steel & Tin Plate Company, New Castle, Pa., which have been under consideration for some time. Through the courtesy of George Greer, president, and Charles Greer, secretary, of the company, we were favored during a personal call with full information regarding the additions to be made at this plant, and also regarding some improved methods to be put in use in the manufacture of tin plate. At the start we wish to state that this concern will not build a stamping works, nor is it contemplated to remove a stamping works from another locality to New Castle, as has been stated.

The present plant consists of six mills, the output being from 35 to 40 tons of black plates per day. The firm have decided to erect 10 or 12 additional mills, making 16 or 18 in all, and when these have been completed, the output of the plant will be from 100 to 125 tons of black plates per day. The addition of these mills will give the New Castle Steel & Tin Plate Company the distinction of having the largest single plant of its kind in the world.

Provision has also been made for the erection of eight additional mills when they are needed. The contract for the new mills has been placed with the A. Garrison Foundry Company of Pittsburgh, Pa., and consists of hot mills, complete tandem cold roll mills, doubling shears, spindles, boxes, crabs, &c. The contract for the engines has been placed with the Bass Foundry & Machine Works, Fort Wayne, Ind., which concern furnished the engines for the present plant. The contract calls for two Corliss cross compound condensing engines of 1100 horse-power each for driving the hot mills, and one Corliss compound condensing engine of 700 horse-power for driving the cold mills. The same concern will furnish 175 tons or more of grooved pulleys for driving the mills by rope power. Power from the engines to the rolls will be transmitted by 2-inch special ropes. The diameter of the largest grooved wheel will be 25 feet, and this wheel will take power from a similar wheel from the engine shaft 14 feet 7 inches in diameter. These wheels are all grooved for 28 2-inch ropes made for this purpose. The contract for the new buildings, of which there will be two, has been placed with the Shiffler Bridge Company, Pittsburgh, Pa. These buildings will be 360 x 110 feet and 360 x 105 feet in size, and will be of steel. Ample light has been provided for and a new system of ventilation will be introduced. The buildings will be absolutely fire proof and will be constructed with a view of handling the raw and manufactured material to the most economical advantage.

In addition to the above improvements the New Castle Steel & Tin Plate Company have in view the more than doubling the capacity of their tinning department and the introduction of considerable labor saving machinery. The plan of driving the mills by rope power, thus doing away with gearing and housing, has been indorsed by some of the leading engineers of the country and pronounced entirely practicable. Incidentally it may be mentioned that this system has been in successful operation for some time in the plant of the New Castle Wire Nail Company, and is now being introduced on a more extensive scale in the rod mill of the same concern. An electric light plant of 100 arc lights of 2000 candlepower each of the very latest design and improvements will be installed. From the same dynamos incandescent lights will be furnished for the office.

Electric cranes, especially designed for this plant, will be used in the hot mill and cold roll mill buildings, and also in the annealing departments. In the construction of these improvements and additions the expenditure of money has been a secondary consideration, the whole object being to have a tin plate plant that will represent the most modern ideas of construction and improvements. It is expected that when the additions to equipment have been completed and the new methods introduced, the plant of the New Castle Steel & Tin Plate Company will be the best equipped tin plate plant in the world, and will, it is said, mark a new era in the manufacture of tin plates.

CABLE ADVICES from England report the stoppage, owing to financial difficulties, of the large Dyffryn Tin Plate Works of Daniel Edwards & Co. at Morriston, South Wales. The liabilities are estimated to be very large, probably between $300,000 and $400,000. The failure of other tin plate concerns is expected to follow. A meeting of employers and employed was held this week at Swansea and a committee was appointed to formulate a scheme to further reduce the make and raise prices to a basis of 11 shillings. Only 16 manufacturers were, however, present at the meeting.

The Welsh Tin Plate Crisis.

Not for 30 years has the Welsh tin plate trade been in such a critical condition as it is in at the present time. Probably never before in its history has the outlook for future improvement been so gloomy. During the disastrous period of depression which followed the close of the war in the United States the entire trade was reduced to the verge of bankruptcy and the workmen and their families were literally starving. But at that time they had always the good hope before them that the American trade, which was their mainstay, would revive again and that they would ultimately be enabled not only to recover their losses, but to extend the market for their product on this side of the water. While things are not yet as bad with the Welshmen as they were in the middle of the '60's, the existing emergency compares to disadvantage with the former crisis in that little hope can be held out to them of retrieving their present losses in the American trade. Still less can they hope to increase their trade on this side of the water. To this fact the Welshmen appear to have been phenomenally blind until within a comparatively recent period.

The rise and progress of the tin plate manufacturing industry in the United States seems to have been blinked, whether willfully or not, on the other side of the Atlantic, until its existence could no longer be ignored. Only three months ago, one of the leading authorities in the Welsh tin plate trade publicly announced that the competition of the American works was no factor in the depression of the trade in Wales, and that the industry in this country was really on a very small scale. And yet, at that time, works having a capacity of at least 1,500,000 boxes were in existence, and were ready to start into full operation at the moment that the wage scale difficulty was settled. This they have since done; and the most sanguine friends of Welsh interests are reluctantly forced to admit, as does the London *Engineer*, in an article recently reprinted in these columns, that "the manufacture of tin plate in the United States is in a fair way to become a great industry."

In this, the day of their adversity, when it has become generally recognized that the United States has begun in reality to make her own tin plates, the Welsh manufacturers and their workmen are finding many candid friends among the English newspapers and trade journals. The general drift of their remarks is the familiar and exasperating "we told you so." On every hand the burden of the censors of the British press is that both employers and employed have been blind to their own best interests and are now reaping the fruit of their folly. They have now discovered, with wonderful unanimity, that the manufacturers should long ago have adopted more progressive and economical methods of manufacture; and that wages should have been "regulated" sooner, while such arbitrary restrictions on production as the famous "36-box rule" should have been discountenanced and done away with. The workmen, they say, should have been more ready to co-operate with their employers for the general good of both instead of resisting imperative wage reductions and insisting on the enforcement of ruinous restrictions on the output. "The employers," says the London *Ironmonger*, "are deplorably lacking in enterprise and the workmen in respect of adaptation to current competitive conditions." The only way of escape from ruin that the *Ironmonger* can see is that the tin plate trade should be taken hold of by the large iron concerns and run on a perfectly modern basis in all respects.

In conclusion we quote the authority just mentioned, which appears to have reached the most practicable and rational solution we have yet seen of the Welsh tin plate difficulty: "With straightforward financing, modern plant and processes, enterprise and 'go' there is no reason why the trade should not remain an important one in spite of any amount of American competition. There is ample room for expansion. For instance, tin plates ought to be and might be used for packing tea in India, Ceylon, China, Japan and other countries, and if the planters were properly approached, they would probably adopt the idea. But the Welsh makers do not approach them and do not seem capable of any effort to save the one trade which up to quite recently was one of our few remaining monopolies."

A New Process of Pickling Metal.

The pickling department is one of the most disagreeable features of wire drawing or tin plating establishments. For some years chemists and electricians have been attempting by the use of electricity to devise a method by which the use of acid could be largely or wholly avoided in cleaning metals. The substitution of electricity was found to be extremely difficult, owing to the resistance in the solutions to the current and the unevenness of action on the substances to be pickled. All efforts in this direction proved abortive until quite recently. It is now stated that the process of cleaning metals by electricity has been fully demonstrated in the West to be a complete success. A Scotch chemist, Dr. A. H. Ramage of Edinburgh, who has devoted years to the study of this question, has lately succeeded in demonstrating on a large scale in one of the leading wire mills of the country that he has overcome all the technical difficulties and reduced the process to practical results. Those who are familiar with what has been accomplished by him are confident that he has perfected a new process of pickling which will supplant the old method.

The process consists in making the articles to be pickled the anode or positive pole during the electrolysis of a solution of a salt of iron. In the case of pickling rods for wire drawing the rods were immersed in a solution contained in a vat made of wood and having round its sides in the solution a thin cylindrical sheet of iron, and connected by the hooks holding the rods to the positive pole of a plating dynamo capable of giving in the case of white pickling a current with a pressure of 1½ to 2 volts, and in the case of black pickling a pressure of 4½ to 5 volts between anode and cathode, while the thin circular sheet of iron was attached to the negative pole. The current passing through the solution liberates the acid of the salt on the anode or article to be pickled and the iron on the negative,

consequently liberating the acid on the rods. This, combined with the surface scale and iron, forming the original salt again, which is dissolved in the solu tion, while the amount of iron dissolved off the rods was deposited on the negative cylindrical plate.

A small dynamo of 8 horse-power served a ton of rods per hour consecutively, cleaning them so thoroughly that they drew down from No. 5 to No. 15 gauge perfectly. The wire was then galvanized, and that operation was also quite successful.

In black pickling the current used is of greater voltage than in white, be cause the scale covering the rods or plates being a poor conductor it caused a greater resistance to the current. As the scale dissolves, the current passes through with diminished voltage.

The process hss also been practically tried with plate for tinning, and are rangements are now being made to place it in some of the largest tin platworks in the country. The plates were pickled ½ ton at a time, and perfectly done, and then tinned.

The process is owned by the International Metal Pickling Company, 1113 Chamber of Commerce Building, Chicago, who have placed it in a wire mill near that city.

Those who have had experience of the steam and acid fumes ever present in conducting the old process will thoroughly understand the relief to workmen which cleaning by electricity will give, while its saving of nearly all the acid used by present methods is of the greatest practical account. The saving in acid in one mill alone amounts to $1800 per week, which shows enormous possibilities in economy. From a sanitary point of view, great advantages are also claimed, as the new process does away with the insidious health destroying fumes and with waste liquors running down drains to pollute rivers and lakes. The pollution of water courses is now becoming an important matter in this country. Looking at the question from all sides, the successful application of electricity to the pickling of metals may be considered one of the great improvements of this decade.

SCRAP.

PRESIDENT M. M. GARLAND of the Amalgamated Association of Iron and Steel Workers was the guest of the American Tin Platers' Union, at Elwood, Ind., this week. He expressed the opinion that the outlook was much brighter for the tin plate business, and he looked for a revival of business in this line during the summer months.

ACCORDING to English advices, more disquieting rumors are being circulated as to the financial position of tin plate works in South Wales. It is stated that at least two large and old established concerns have actually suspended payment, and that others are likely to follow suit.

A PRESS CABLE DISPATCH of February 28 from Swansea, Wales, states that at a meeting of the South Wales Tin Plate Board of Control, held that day, it was decided, in view of the depression in the tin plate trade, to only run 397 mills, and that these establishments were to run only on two-thirds time. It was also resolved to restrict the production to one-third of the present output. Eighty-five mills which have not joined the Board of Control will work independently.

THE LEECHBURG FOUNDRY & MACHINE COMPANY, Pittsburgh, have made their first shipment on the contract for tin plate machinery to the La Belle Iron Works, Wheeling, W. Va.

F. R. PHILLIPS, Philadelphia, is erecting and equipping the entire tin plate plant for McIlvain, Crater & Hugh, at Reading, Pa. Two Phillips-Newbold machines have been shipped to the works and a third will follow as soon as ready. Mr. Phillips advises us that he has recently shipped three of his latest improved eight-roll machines to the Falcon Tin Plate & Sheet Company, Niles, Ohio, and two to Richmond, Va. Three more are building for the South and nine for the West.

A NEW FEATURE in the British Board of Trade returns of imports and exports for the month of January last is a separate table showing the exports of black plates of steel and iron for tinning. Prior to 1895, iron black plates were included with "hoops, sheets, and boiler and armor plates," while steel black plates were enumerated under the heading of "steel unwrought;" consequently it was very difficult to obtain any reliable statistics as to the amount of black plates for tinning purposes shipped to the United States from Great Britain. The amount so exported in January, 1895, was 24,153 tons. To all other countries 15,808 tons were shipped, making total exports 39,961 tons.

POLLOCK & Co., Limited, is the style of a firm located at 2040 North Tenth street, Philadelphia, who have commenced tinning plates. They have one pot running on roofing plates and expect to have others in operation shortly. The concern originally were manufacturers of solder, and they propose to continue that branch in connection with their new venture.

WE UNDERSTAND that a new tin plate works will shortly be put in operation in Baltimore, Md. A suitable location in the section of the city known as Canton has been secured and contracts have already been let for the machinery equipment. It is reported that the contracts include machinery for rolling black plates.

MERCHANT & Co., Incorporated, Philadelphia, are now running six pots at their tin plate works.

THE QUESTION of the actual capacity, present and prospective, of the American tin plate works is a particularly interesting one, in view of the prediction freely expressed that their product will before long outrun consumption. John Jarrett of Pittsburgh, secretary of the Tinned Plate Manufacturers' Association, who has excellent facilities for gathering information on this head, figures out that at the present time there are in operation in this country, and in actual course of construction, 157 hot mills. There are contemplated, and will likely be erected within the next six months, 39 additional mills, or a total of 196 hot mills that are expected to be in operation by October 1 next, or earlier. Allowing a product of 2 tons to the turn, or 6 tons per day for each of these mills, which is a low estimate, gives a total daily output of 1176 tons. Computing 270 working days to the year gives an annual output of 317,520 tons of 2240 pounds each of black plates. In a box of IC plates, 14 x 20, there are 112 pounds. Simply multiplying the total output by 20, the result gives a potential production by American tin plate works of 6,350,400 boxes per annum.

SERVICEABLE DESK BLOTTING PAPERS are being distributed by Nathan Trotter & Co., Philadelphia, Pa., in the interests of their special plates. One blotter, backed with smooth paper, refers to Trotter's roofing, which is described as a high grade American roofing plate, extra heavy coated and every sheet guaranteed to be equally and evenly coated, the sheets furthermore being resquared and stamped with brand and thickness. An important feature of this plate is that there are no wasters. The firm have had a long experience in supplying the wants of the American people in the line of tin plates and metals, having been established in the year 1789 and are therefore in their 106th year.

THE TIN PLATE DECORATING COMPANY, 110 John street, New York, an old-established concern making a specialty of color work and other decoration for tin ware, speak in high terms of the smooth and even quality of the coating on the high grade bright tin plates made in this country. They refer to the American product as lending itself peculiarly well to their work, for the finer kinds of which a particularly smooth surface is indispensable.

THE HENDERSON TIN PLATE COMPANY, Norristown, Pa., have their works still closed down, and there seems to be no probability of their being put in operation in the near future.

THE WORKS of the Norristown Tin Plate Company at Earnest Station, near Norristown, Pa., are closed down indefinitely and Richard Lewis, their late manager, under whose superintendence the works were erected and successfully run for over two years, has returned to Wales. We are informed by Charles S. Trench & Co., 20 Cliff street, New York, the agents of the Norristown Tin Plate Company, that the works are now for sale. They include eight tinning sets, a steam pickler, electrical plant and other recommendations.

THE Falcon Iron & Nail Company and the Falcon Tinplate & Sheet Company of Niles, Ohio, have opened an office and warehouse in Chicago for the sale of Galvanized and Black Sheet Iron, Cold Rolled and Common Surface Sheet Steel and Tin and Terne Plate. A full stock will be carried at all times, so that prompt shipments can be guaranteed. The office and warehouse are at the well-known stand at 16 and 18 West Lake street and will be under the management of Wm. E. Stockton, who was for many years the Western representative of Moorhead, McCleane Company. The Falcon companies have for some time been contemplating the establishment of a warehouse in Chicago, and are fortunate in securing such a well and favorably known representative of the Sheet trade as Mr. Stockton to manage it. E. C. Brainard, general salesman, will be more closely associated with the home office in the future.

TWO HUNDRED AND THIRTY Welsh tin plate mills, out of a total of 531, were entirely idle the first week of this month, and many more were running at a low rate of production. Since that time others have shut down, so that nearly half the tin plate capacity in Wales is now inactive.

THE eight mills of the Dyffryn Tin Plate Works, Morriston, South Wales, are idle.

STOVE TRADE NOTES.

Daniel M. Thomas.

The death of Secretary D. M. Thomas, which was briefly announced in these columns last week, removes from a broad field of usefulness a man of sterling worth and one whose loss to the stove trade of the country will be severely felt, especially by the two associations with which he was prominently identified during the later years of his life. Although the trade at large was kept advised from time to time of the serious illness of Mr. Thomas, and finally of the faint hopes entertained of his ultimate recovery, the announcement contained in our last issue must have come as a sudden shock to the multitude of those who enjoyed a personal acquaintance with him, while many others who knew him only by his name and works will deeply regret the loss to the business world. For nearly a year past Mr. Thomas was far from a well man, but it was not until his return from a meeting of the stove men in the West, early in December last, that his condition became such as to alarm his friends. For a time he was confined to his home, but during the holiday week felt so much better that he visited his office at 80 Broadway, New York. The improvement in his condition, however, was of short duration, and with occasional rallies he gradually grew weaker until at a quarter before 12 on the morning of Thursday, February 21, he quietly passed away.



DANIEL M. THOMAS.

Mr. Thomas was born on May 11, 1840, at Swansea, South Wales, where he received his early training and education. At the age of 14 years he became connected with the tin plate industry, remaining in Swansea until the year 1867, when he came to America. His first business connection in this country was in the capacity of bookkeeper for the house of Foxell, Woodworth & Jones, hollow ware manufacturers, Troy, N. Y. In February, 1868, in connection with the late Louis Potter of the then stove manufacturing firm of Potter & Paris, he formed what was known as the Troy Galvanizing Company. In November, 1868, Mr. Potter disposed of his interest to the firms of Hicks & Wolfe and Sheldon & Greene, at that time prominent stove makers of Troy, but the business was continued until galvanized reservoirs ceased to be largely employed for stoves. In 1871 Hicks & Wolfe leased the foundry of Morrison & Colwell, at Green Island, and Mr. Thomas assisted in the management, which may be said to have been his introduction to the stove business of this country. In the year 1874, the galvanizing trade having been rendered unprofitable by the introduction of tin lined copper reservoirs for stoves, Mr. Thomas, in connection with two others, erected in 1875 a foundry at Medina, Ohio, for the manufacture of hollow ware. Owing, however, to a lack of sufficient capital, the enterprise was not altogether successful, and Mr. Thomas turned his attention to other things. Later in the year named he was invited by the late W. H. Tefft, president of the Detroit Stove Works, Detroit, Mich., and the late John J. Bagley, Governor of the State of Michigan, to make his home in Detroit. This he did, and in connection with Mr. Tefft, Gov. Bagley, Francis Palms, E. S. Barbour, M. I. Mills and Jeremiah and James Dwyer, he formed what was known as the Detroit Iron & Brass Mfg. Company, incorporating it under the laws of the State of Michigan, the principal product of the company being stove hollow ware. As secretary, he continued in the management of this corporation until the year 1887, when the charter was surrendered. The business was carried on in Detroit until 1881, when it was removed to Elmira, N. Y., and continued under the name of the Chemung Hollow Ware Works.

It was, however, in his relations to the National Association of Stove Manufacturers and the Stove Founders' National Defense Association that Mr. Thomas was best known to the stove trade of the country. It was at the Louisville meeting of the stove manufacturers, held February 3 and 4, 1886, that a resolution was adopted authorizing the employment of a permanent secretary. Mr. Thomas received the appointment and entered upon the discharge of his duties July 27, with headquarters in Louisville. The Defense Association was formed at Cleveland, Ohio, on June 4, 1886, at which time Mr. Thomas was elected secretary of that organization. These positions he retained until February 1, 1890, when he retired and shortly afterward took general charge and direction of the affairs of the Keeley Stove Company of Columbia, Pa. At the Chicago convention of the National Association of Stove Manufacturers held the first week in February of that year Mr. Thomas was elected president, which office he held until the Philadelphia meeting the first week in May, 1891. At this time he was again selected for the office of permanent secretary of the two associations, retaining it until the time of his death. Mr. Thomas was in many ways peculiarly well qualified for these important offices, being a man of strong character, wide experience, not easily discouraged by difficulties however serious, and of excellent executive ability. At the time of his death he was a member of the American Institute of Mining Engineers and president of the Bower-Barff Rustless Iron Company, he being elected a director of the company on October 2, 1891, and president on August 31, 1892. He leaves a widow, three daughters and a son.

The funeral services were held at his late residence, 134 Fort Greene place, Brooklyn, N. Y., at two o'clock on the afternoon of Monday, February 25. The impressive burial service of the Episcopal Church was read by Rev. Dr. Lindsay Parker of St. Peter's Church, assisted by a boy choir, which rendered, among other pieces, "Abide With Me," "Rock of Ages" and "I Heard a Voice from Heaven." The floral tributes were numerous and beautiful, conspicuous among them being a large wreath of lilies of the valley, with the letters "N. A. S. M." in dark flowers across the center; a handsome cross from the New York members of the National Association of Stove Manufacturers, and a beautiful wreath from the New England Stove Manufacturers' Association.

Among the friends who gathered at the house were representatives of the stove associations with which Mr. Thomas was connected, and also members of the local trade. Prominent among those present were George D. Dana of St. Louis, Mo., president, and W. S. Stevenson of Philadelphia, Pa., treasurer of the National Association of Stove Manufacturers; W. T. Bradberry of the Anshutz-Bradberry Company, Pittsburgh, Pa; E. W. Peck of the Co-operative Foundry Company, Rochester, N. Y.; Abram C. Mott of the Abram Cox Stove Company, Philadelphia, Pa.; W. F. Greene of Troy, N. Y.; C. L. Merritt, formerly of Jones & Merritt, hollow ware manufacturers of Auburn, N. Y.; Prof. George W. Maynard of the Bower-Barff Rustless Iron Company; Eugene Munsell of Eugene Munsell & Co., D. S. Ramsay of Ely & Ramsay, Fred. and Dwight Richardson of Richardson & Boynton Company, Henry E. Janes of Janes & Kirkland, agents for the Michigan Stove Company, and William Corry, all of New York City.

The Stove Trade of the Ohio Valley.

Reports respecting the stove and range industry within a radius of 200 miles of Cincinnati are still somewhat conflicting, but the impression is given of an improvement in the volume of business, certainly in the growth of confidence. Especially is this the case in Ohio and Indiana. There are exceptions, of course, even in Ohio, but south of the Ohio River the opening of better times seems to be delayed beyond the experience of those in more fortunate situations.

Some manufacturers in Ohio are very emphatic in their statements of marked improvement in trade since the opening of the new year, citing a volume of business in January more than double that of January, 1894, while thus far February has kept pace with the preceding month's record. On the other hand there are foundries south of Mason and Dixon's line where sales have averaged about 10 per cent. less thus far during the current year than during the corresponding period of 1894, and in consequence some manufacturers are still running only half time, without encouraging prospect for the early future. Money continues scarce and collections poor.

Of course the value of any comparison with last year depends largely upon the actual business done a year ago, and all improvement or depression is of a relative nature. Happily the experience of the Southern foundries seems to be the exception rather than the rule. The stove cupolas north of the Ohio are melting more and more iron as the season advances, as is evident from purchases of pig iron, reports of contracts and by direct information of a number of manufacturers, who are resuming operations or increasing half to full time. The money market at Cincinnati has hardened materially during the week, with increased application for discount from merchants and manufacturers and liberal shipments of currency to the rural districts.

Philadelphia Stove Trade.

The stove trade in this section is dull and inactive. It was naturally expected that the recent cold snap would stimulate the trade sufficiently to help off the stock of heating goods remaining in the dealers' hands. Such was not the case, however, except as regards gas and oil heaters, which goods found ready sale and were practically cleared out. The demand for coal stoves throughout the month of February was exceedingly light. Of course after the end of January the season for heating goods is considered closed, but it was surprising that the continued severe weather did not prolong the season. There is a little doing in ranges, but it cannot be said that business in this line is up to the average. The demand for furnaces keeps up wonderfully well, especially in the higher grades.

Refrigerators and gas and oil cooking goods are making their appearance on the market, and the outlook for a better trade than was experienced last year in this line is very encouraging. Most of the goods show improvement upon last season's styles, and the variety is somewhat increased.

It is pleasing to notice a decided improvement in collections. Fully two-thirds of the obligations maturing last month were met in full. Requests for renewals of paper were for the most part accompanied by cash remittances, and the plea of "hard times" was urged by chronic laggards in a lesser degree than for some time past.

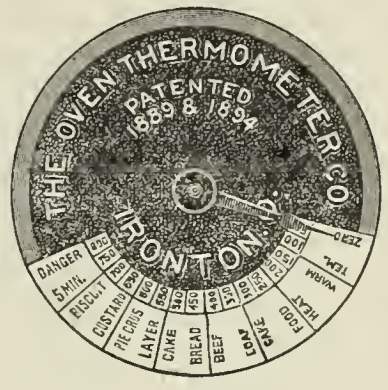
Stocktaking has occupied the attention of founders more or less since the opening of the year, and the running of foundries consequently has not been steady, even with a decreased output. There is a comfortable feeling existing in regard to the future, and the usual preparations in the way of new goods for the coming season are evident. It is pretty generally conceded that the demand next fall will be large, but conservatism in regard to outputs will be studied, and therefore it is not at all likely that there will be heavier stocks warehoused than was the case last year, reliance being placed upon a full running of plants to supply the demand.

The Secretaryship of the National Association of Stove Manufacturers.

We are in receipt of official advices that the office of secretary of the National Association of Stove Manufacturers will, for the present at least, be continued at 80 Broadway, New York City, as heretofore. Miss M. A. Thomas has been appointed to serve as secretary until the next annual meeting of the association in May. All correspondence pertaining to association matters should therefore be addressed as above.

Oven Thermometer.

In speaking of the oven thermometer shown in the accompanying illustration the Oven Thermometer Company of Ironton, Ohio, say that it is just the proper thing for bake ovens of all descriptions and that it has been in use by a number of professional and amateur cooks with great satisfaction. The hand on the dial is operated by mechanism which is moved by the expansion of a straight piece of brass which is fastened securely at both ends. A very little expansion causes a considerable curve and the movement is transmitted by means of a cogged rack to a small pinion on the shaft which passes through the tube to the dial. In adjusting it to an oven door it is only necessary to drill a ¼ inch hole to allow the small tube to pass through. The casting to which the brass rod is attached is then fastened to



Oven Thermometer.

the oven door by means of a jam nut to which the dial is attached. All the iron parts are nickel plated and the dial is enameled in the same manner as watch dials. The parts being interchangeable, any part that may be broken can be replaced in a few minutes. The company issue circulars, which will be furnished on application, showing the dials used in connection with coal and wood stoves and with gas ranges. They are said to be very simple and easily adjusted.

New York East Side Chat.

The late John S. Perry paid a great deal of attention to statistics, and among his addresses to the stove trade was one touching immigration. The prospective immigrants were counted as large consumers of stoves, and so they are, for stoves formed a part of every family outfit, and a diminution of immigration meant a lesser demand for stoves. But in addition to its consumption of stoves immigration has brought a large number who have become dealers in them, and it is astonishing how successful are many of them. New York numbers lots of these people, who couldn't speak a work of English, who have started in the business and are in good circumstances—in fact are wealthy, according to their way of living. As soon as the Americans make money they begin to spend it, and plenty spend more than they make. The family want to get away from the shop and have a house to themselves, and it takes considerable money to run them without regarding accumulation. Not so with the for-

eigners. They save and pinch and live in the same surroundings that would hardly suit even the poorest Americans. As the greenhorns arrived in New York they were in demand, and as they could not speak United States, would work for their board. Excellent help and mechanics were easily procured by the East Side dealers for nominal wages and they made them earn it. Nights, days and Sundays they put them through; they would send men downtown and make them bring up a load of stuff big enough for an express wagon, carry stoves on their backs or in hand carts—in short, it was an ever lasting work for the greenhorn.

They usually put in an appearance through Water street in company with one of the boss's progeny, perhaps a little girl eight or nine years old. It is surprising how young these children begin to learn business. She has the orders written out, and as the pieces are bundled up she pays for them and the man carries them home. Some of these tots interpret very fast and seldom make mistakes. The parents of many of them never learn English and cannot make themselves understood, although they may have been here for years. They depend entirely upon their children, consequently the youngsters early acquire business habits and are unusually precocious. The daily contact with the teeming East Side populace whose only refuge is the streets is a prominent factor in their development. They are always sent to school, and it is somewhat surprising the metamorphosis that is made in them in a few years, especially the girls. They begin to spruce up very early, and as they generally come from a healthy stock they round up in great shape, and the dirty little snip soon becomes a natty young woman. But, of course, she will have the East Side polish, which is not exactly of the 400 style, but it is a sort of a sure Mike kind and no humbug, and when she slings on her duds Sundays and holidays and goes down to Coney Island or wherever she pleases, she don't say nothing to nobody and nobody desires to say anything to her unless she wills it. There is no theory about her education; it is practical and what she knows she knows. People who are brought up in the tenement house districts acquire what may be termed a tenement house twang to their voice and it seldom leaves them. Many of these people get uptown and live in great style—that is, as far as spending money and having fine houses are concerned—and they really do enjoy being sociable and having good times, and as a rule they don't neglect their downtown neighbors. Many of the East Side tenements turn out a big crowd who visit up in the high priced circles of the city and they all have a good time. But if you once get on to that twang you will never mistake the origin of many of New York's finely draped people. They certainly are stylish looking, and if you did not know their voices you would think they were McAllister's intimates.

You can rely upon it that Heinne Schnitz, whose portrait adorned *The Metal Worker*, will get uptown before long. He has got some fine looking kids and they will boss him out. The men who have the hard times with these greenhorns when they begin to come downtown for repairs are the porters in the stove stores. They have a smattering of English, but it is as clear as mud to the porter as to what Heinne or his brother would want. As soon as they commence to ask Heinne about "the dates, or, if it is a draw grate, does it shake on the side ?" the trouble begins. Usually when people do not understand each other's language, they make amends by yelling about what they wish to say, and by doing this they are evidently under the impression they make it perfectly clear what they do say.

But the Water street porter is not a saint at any time, and the crowd and rush in the fall transform him into a demon. There are always a lot of people after repairs, and as they come in a rush, all wanting to be waited on at once, it is very trying; and when it comes Heinne's turn in one of these crowds to get his stuff, and he has to be questioned about it, you can rely upon it there is a row. But Heinne grows out of it in a year or two, and when "he makes pisness by himself," somebody looks after him besides the porter, and "How do you do, Mr. Schnitz ? How is all the family, Mr. Schnitz ? Come down to get some stoves to day, Mr. Schnitz ?" &c. One touch of business makes kindred of us all.

JEEMS.

ODD PLATES.

THE KERNAN FURNACE COMPANY, Utica, N. Y., will be represented upon the road during 1895 by the following salesmen, who will cover the territory named: William J. Owens, in Illinois and Wisconsin; George B. Carrwith, headquarters at Omaha, Neb., in Minnesota, Iowa, Nebraska, Missouri and Kansas; C. H. Fresher, Western Pennsylvania, Southern Ohio and Indiana; E. R. Rayburn, in Northern Ohio and Michigan; J. A. Breen, in New York and Vermont; John Hastings, in Central New York, and Harry King, in New York City, Brooklyn, Eastern Maryland and the District of Columbia. The company's Chicago branch will be in charge of Charles A. Sweeney and Edward F. Kernan and their Denver branch, which will handle the trade in Colorado, Wyoming, Utah and the Pacific Coast, will be under the management of Kellogg & Stokes.

THE Albany. N. Y., branch of the Stove Mounters' International Union has appointed a committee to visit the various foundries in that city and endeavor to arrange for carrying on the business under the auspices of the union.

JACOB WILSON, Easton, Pa., has augmented his popular line of New Idaho ranges by the addition of a size having an oven 20½ x 21 inches in area and 13 inches in hight.

THE WEST SIDE FOUNDRY COMPANY of Troy, N. Y., have just completed the list of their traveling men and the territories to be covered this year, as follows: D. L. Hamill, for Western New York; J. F. Hart, for Eastern, Northern and Southern New York; E. Geer, for Vermont and New Hampshire; O. C. Harrison, for Michigan, Wisconsin and Minnesota; E. B. Morse, for Indiana, Eastern and Southern Ohio. In Northern Ohio the company will be represented by the Stolberg & Clapp Company of Toledo, Ohio.

THE EXCELSIOR MFG. COMPANY, St. Louis, Mo., advise us that their agent at Austin, Texas, Geo. A. Brush, has sold one of their largest Charter Oak ranges to Mrs. Governor Culbertson of Texas. Mr. Brush in writing to the Excelsior Mfg. Company with reference to this sale admits that he feels very proud of having made it, as the cook in the Governor's house is a prize cook, and had a Charter Oak range in her mother's house for seventeen years, and thus feels that she knows the merits of the Charter Oak stoves.

THE LEHIGH STOVE & MFG. COMPANY of Lehighton, Pa., are distributing a neat four-page folder illustrating and describing the Lehigh range, which is offered the trade in four sizes and 32 varieties. This stove has been upon the market for nearly five years, and has established for itself an enviable reputation among dealers. The circular states that this stove "marks a distinct improvement in range construction, being made with what is known as a sheet flue, which, while increasing the draft and making a marvelously quick baker, at the same time avoids any contraction of the oven." It has patent triplex grate, oven door opener and attractive ornamentation, in which nickel plays an important part.

THE MODEL LEHIGH RANGE, which has recently been placed upon the market by the Lehigh Stove & Mfg. Company of Lehighton, Pa., is the subject of a very complimentary notice in a recent issue of the Lehighton *Press*. Reference is made to a practical test of this range in the kitchen of the residence of Mr. Butler, at East Mauch Chunk, Pa. On Saturday evening, February 16, Mr. Butler entertained E. L. Smith, the bookkeeper of the stove works; Isaac Oberholtzer, superintendent of the mounting department, and Jacob De Frehn, who has charge of the shipping department. The entire dinner was prepared on the Model Lehigh and was a success in every particular.

THE CLEVELAND STEEL RANGE COMPANY have just completed arrangements for the transfer to them of 66 feet of land at the northwest corner of Detroit and State streets, Cleveland, Ohio, where they propose erecting early in the spring a three-story factory which will accommodate about 300 men. We understand that by the terms of the transfer the company gain control of the entire lot, which extends back to Vermont street. The building will be of brick and equipped with machinery of the most approved pattern. At the present time a frame dwelling occupies the new site, but this will be moved to the west of the lot so as to make room for the new building.

THE WEIR STOVE COMPANY of Taunton, Mass., are making arrangements to enlarge their works in order to provide additional facilities for meeting the increasing demands of their trade. About two years ago they added a story to the office portion of their main building, and now they propose to raise the remainder of the structure another story, thus making both parts uniform. The work will be commenced as soon as the weather will permit and pushed rapidly to completion.

MICHAEL RAGAN of Cadott, Wis., died of Bright's disease on February 13, at the age of 32 years. He was manager of the Cadott Heating & Stove Company and secretary of the Northwestern Heating and Stove Association.

THE GEAUGA FOUNDRY & MFG. COMPANY, Painesville, Ohio, have a curiosity in the shape of a cook stove which is claimed to be the oldest of its kind in that State. It is said to have been cast in the year 1822, direct from a blast furnace, the material being charcoal iron made from bog ore.

THE SHULTZE STOVE MFG. COMPANY of Austin, Texas, were recently incorporated, with a capital stock of $20,-

000. The incorporators were Herman Shultze, Claude Wright and Gustavus A. Bohnert.

THE PHILLIPS & CLARK STOVE COMPANY of Geneva, N. Y., have resumed operations after being closed about two months.

JOHN H. SCHNEIDER, eldest son of Paul and Anna Schneider, died at Bedford, Ohio, on Friday, February 22, in the twenty-fourth year of his age. He was assistant superintendent of the Schneider & Trenkamp Company of Cleveland, Ohio.

THE RICHARDSON & BOYNTON COMPANY, 234 Water street, New York, are receiving congratulations on the behavior of the Perfect hot air furnaces during the recent cold weather.

THE TOLEDO STOVE COMPANY of Toledo, Ohio, whose foundry has been closed for a short time on account of damage from fire, advise us that the *débris* has been removed and that their molding department is now in complete running order.

THE SUPERIOR STEEL RANGE COMPANY of Cleveland, Ohio, have recently removed their offices to the large building 131–135 Viaduct, where they enjoy increased facilities for handling their large and growing business. The demand for Superior and Marquart steel ranges is of a gratifying character, and with their new accommodations they are prepared to promptly handle all orders with which they may be intrusted.

THE LEHIGH STOVE & MFG. COMPANY of Lehighton, Pa., are distributing an illustrated circular calling the attention of the trade to their Model Lehigh range, fitted with patent oven thermometers. The latter device is so placed as to show at a glance at the outside of the oven door the degree of heat within the oven. The device tells when the oven has reached the proper temperature, and avoids the time and trouble of constantly opening the oven door to see if the heat is great enough. It also tells how to manage the fire by showing when the oven is nearly at the right heat, at which time, with a good fire, the front drafts can be closed. This not only saves putting on fresh fuel while baking is in progress, but also saves in the amount of fuel used. The Model Lehigh embodies all the improvements of the famous Lehigh series, and has ample flues, cut top, large oven, patent duplex grate and attractive ornamentation.

THE EMERGENCY TRADE resulting from the cold weather has made business brisk for Sam S. Utter of 113 Beekman street, New York, oil and gas heaters alike being in demand. Arrangements are being made for a lively summer trade and his line of oil and gas cooking stoves for this year will be of the up-to-date character.

THE FRONT RANK STEEL FURNACE COMPANY, 705–707 North Main street, St. Louis, Mo., are distributing to their friends in the trade cards measuring 3½ x 6 inches, calling attention to the fact that they are heating contractors and in a position to furnish and install both warm air and hot water apparatus.

THE BRAND STOVE COMPANY of Milwaukee, Wis., are about to open a branch warehouse and salesroom at 77 Lake street, Chicago, on the ground floor, under the management of De Witt Van Evera, as heretofore. They will carry a stock of stoves and a full line of castings. They will be fully equipped and in better shape than ever to do business in Chicago and suburbs, having what they consider one of the best locations in the city for handling goods. They expect to be ready by March 11 to make deliveries of both stoves and castings from the Chicago house.

THE PORTSMOUTH STOVE & RANGE COMPANY, with general office and works at Portsmouth, Ohio, have just issued a little pamphlet of a size convenient to carry in the pocket, illustrating and describing their model steel ranges. These are shown in different varieties, accompanied by full descriptive particulars. Attention is also given to steam tables, charcoal broilers, &c., while price-lists and numerous testimonials constitute other features of the little volume.

THE K D STEEL RANGE COMPANY have recently been incorporated at Cleveland, Ohio, with a capital stock of $10,000, for the purpose of buying, selling and manufacturing steel ranges and novelties. The new concern are erecting a factory for manufacturing purposes and expect to have the plant in operation in about six weeks. The incorporators are Frank Lewis Warke, Oscar T. Emrich, Frank C. Cain, Irving E. Hershy and Frank E. Dellenbaugh.

MAY & FIEBEGER, Akron, Ohio, are offering the trade what is known as the Akron air blast furnace, so constructed, it is claimed, as to successfully burn all kinds of fuel, but more especially soft coal. This heater is the invention of Mr. May, who after 25 years' experience in the furnace business became convinced by careful experimentation and study that radical improvements could be made in furnaces as then constructed. He therefore invented and about six years ago perfected the "air blast" principle for burning coal, which he has applied to the Akron air blast furnace. This heater has been before the trade sufficiently long to establish for itself an enviable reputation, and during the extreme cold weather of the past winter has been severely tested with entirely satisfactory results.

JAMES P. GARDNER has an article in a late issue of the Cincinnati *Commercial Gazette* in which many facts and figures of interest in connection with the American export trade are presented. He shows that from June 30, 1892, to June 30, 1893, there were exported stoves and ranges valued at $216 463, and for the fiscal year ending June 30, 1894, the valuation was $236,284, showing an increase of $19,821.

THE FAVORITE STOVE & RANGE COMPANY of Piqua, Ohio, received under recent date a very complimentary letter relative to a gas range which they have lately put upon the market, the writer being the general superintendent and engineer of the Mutual Fuel Gas Company of Chicago, Ill. We quote from the letter the following extracts: "The burners work perfectly under a range of pressure of from 1 to 4 inches, and I have been unable to make them explode either while lighting or turning off the gas. The pilot for lighting the oven burners is both ingenious and effective, and without doubt, the best I ever saw. The oven is a gem, being amply large for any family, and perfection itself in its operation."

GRINBERG BROTHERS of 154–155 South street, near Peck slip, New York City, are pushing with a great deal of enterprise the sale of their specialties in the way of gas and oil stoves. They are offering the trade, among others, the Eagle two burner hot plate for gas and a two-burner lamp stove made under the same name.

THE B. C. BIBB STOVE COMPANY, Baltimore, Md., are about to place on the market the Harford, a portable range in two sizes, for use either with or without a fire place. It has a horizontal boiler, right or left oven, ash pit of ample size, patented device for heating an upper room, and all modern improvements. The range will also be supplied to suit an ordinary side boiler, and fitted with brackets and plate shelf. The company are also redressing their Washington fire place heater, and the same, in its improved style, will be known as Washington No. 2. The company's works are at present closed for stock taking.

WE HAVE RECEIVED from the Michigan Stove Company a package of circulars and pamphlets calling attention to a number of their leading specialties. One of these publications which is printed in colors relates to the Oak-Garland line of stoves for hard or soft coal or wood. A four-page folder illustrates and describes the Syphon Oak-Garland, an attractive base heater embodying the latest features. This circular is also printed in colors and presents a general view of the stove as well as a view showing the bottom of the stove removed and the base flues exposed. A circular which we find in the package carries a picture of an outside swinging sign consisting of the Garland trade-mark. The sign represents the results of efforts which have been made ever since the company's trade-mark was originated, with a view to producing something that would exactly meet the requirements. The sign is made of stamped metal and measures 36 x 44½ inches. The purpose of the sign is to hang in front of the dealer's store, where it cannot fail to attract attention. These signs are offered at the low price of $11 each and the company agree to take back the sign at any time and to refund the money. We also have from the company a card, intended for transmission through the mails, and carrying upon one side reference to the use of aluminum in Garland stoves and ranges and to the fact that they are provided with aërated ovens.

FLASHINGS.

THE JOHN MCVOY CORRUGATED IRON WORKS, Muncie, Ind., are reported as running steadily, and shipping out three carloads of iron a week.

J. J. LINSKY, Union City, Conn., is remodeling his building, which will have sheet metal cornice and skylights.

THE JERSEY CITY GALVANIZING COMPANY, 112 John street, New York, have just issued a new and enlarged catalogue and price-list of their specialties in metal roofing, corrugated and round leader, ventilators, and sheet iron work of a large variety. The company are running their works in Jersey City, N. J., full and speak encouragingly of the outlook in business.

GLOBE VENTILATOR COMPANY, Troy, N. Y., send out cards calling attention to the merits of their well-known device. A white line sketch of a ventilator ousting a company of disease germs, together with an appropriate description in verse, is a feature of the card.

Star Wrenches.

The cuts shown herewith represent wrenches offered by the Star Wrench Company, 801 Wainwright Building, St. Louis, Mo. The pipe wrench, Fig. 1, is made without springs and is interchangeable in all of its parts. The movable jaw and the nut are made with an oval top and bottom thread, guaranteed by the makers not to slip or burr. The manufacturers claim that the wrench grips the pipe firmly without any lost motion, and that it will not mash the pipe nor slip off. The wrench is made in eight sizes,

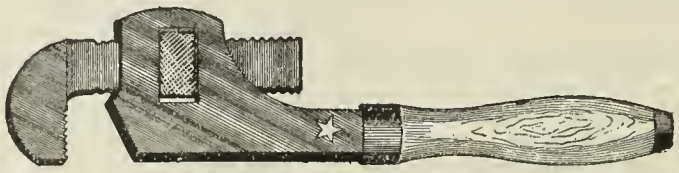


Fig 1.—The Star Pipe Wrench.

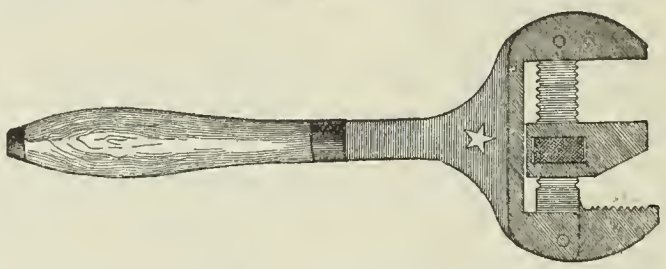
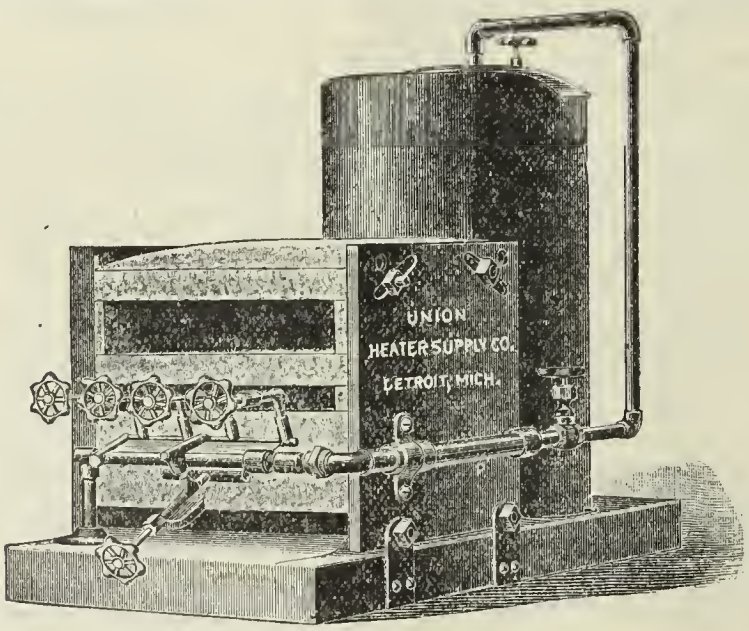


Fig. 2.—The Star Combination Wrench.

lengths from 6 to 48 inches, to take pipe from ⅛ inch to 5 inches in diameter. The combination wrench, Fig 2, is referred to as simple in construction, strong, durable, and as entirely free of springs. It is claimed that it is interchangeable in all its parts, and that it cannot slip, lock, or mash the pipe. The wrench is designed for nuts, couplings and pipe, for the use of plumbers, gas fitters, machinists, engineers, and for every branch of the mechanical trade where a wrench is used. The tool is made 10 and 14 inches long, to take from ⅛ inch to 1½ inch pipe.

Tool Dresser.

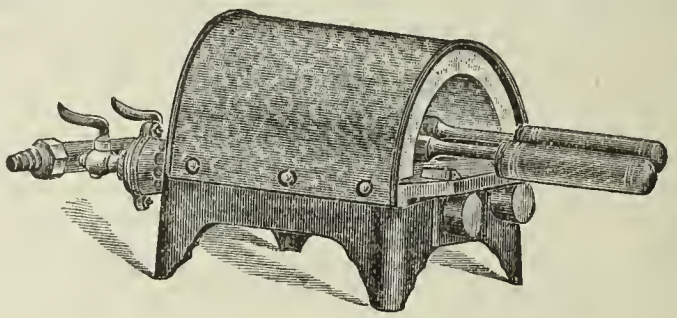
The Union Heater Supply Company, 90 Congress street, Detroit, Mich., make a specialty of gasoline apparatus for mechanical purposes, and one of their tool dressers is shown in the illustration herewith. It is designed to take the place of a forge for heating tools for dressing, tempering and annealing. It occupies but little space, can be readily transported to the work, is clean, and after the fuel tank is filled and the air pressure applied a steady flame is always ready immediately on opening the burner needle valve. The opening for the insertion of tools for heating is 8 inches wide, 2 inches high and 6 inches deep.



Tool Dresser.

Gas Soldering Iron Furnace.

The accompanying illustration shows a general view of a new gas soldering iron heater that has just been brought out by A. Weiskittel & Son, Baltimore, Md. The manufacturers allude to the present demand for a heater of this kind on account of the requirements of the insurance companies. The furnace is designed with a view to give the greatest heat with the least consumption of gas. It has two burners controlled by separate cocks, as shown in the illustration, so that one or two soldering irons can be heated at a time, as desired. The hood or top is made of semi-circular fire brick covered with sheet iron, which holds the heat and increases the efficiency of the burners. The device is sold at a reasonable figure, and the trade are requested to write for prices and circulars.



Gas Soldering Iron Furnace.

A trial of a Harveyized steel armor plate, manufactured by John Brown & Co. of Sheffield took place on February 12, at Portsmouth, England. The plate was selected by the Admiralty authorities from a batch of plates forming one of the barbettes of the new British battle ship "Magnificent," now building at Chatham, and had been reduced to the following dimensions: 8 feet in length, 6 feet in width, and 6 inches in thickness. Four 6 inch Holtzer projectiles were fired against the plate, with the velocities of 1507 feet, 1815 feet, 1960 feet, and 1815 feet per second respectively. All the projectiles were completely broken up, fragments of the third shot alone succeeding in just perforating the plate and lodging in the backing. The penetration in the other cases was estimated at from 2 inches to 4 inches. The trial was considered very satisfactory, the behavior of the plate being almost identical with that of the original test plate manufactured by Brown & Co., and tested in February, 1894.

As an illustration of the rapid introduction of the basic open hearth in this country, it is stated that the cargo of dead burnt Styrian magnesite received by the Fayette Mfg. Company on the steamship "Alsatia," arriving on February 15, was all sold three weeks before the arrival of the vessel. The above company have made arrangements for the receipt of this material every month, which insures fresh material and prompt shipments. This dead burnt magnesite is ground and prepared for bottoms and repairs, and is in a convenient shape for storing and using, there being no loss in transportation or handling. In the items of labor and refractories it has been shown that the small manufacturer with two open hearth furnaces using prepared magnesite is on the same basis as a larger manufacturer with a larger number of furnaces using magnesite or dolomite.

Herr Joseph Treitl, an ironmonger, of Vienna, who has just died at the age of 91, has left 800,000 florins to the Vienna Academy for the promotion of scientific research.

A very marked revival is reported in the lumber business in Tennessee, where a number of manufacturing concerns have started into operation after long seasons of idleness, and others are preparing to start.

TRADE REPORT.

The Iron Market.

Pig Iron.—There has been no change in the situation in the New York market. Consumers are melting a fair amount of Iron, but are still buying cautiously. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

The Pig Iron market in the Philadelphia district is reported as very quiet, and although the aggregate tonnage is considerable, it is taken in such a way that it is hardly noticed. Small orders frequently renewed appears to be the fashion, except when some special inducements are offered, which at the present low prices cannot be very often. The impression gains ground that higher prices for Coke and Ores are among the probabilities for the near future, but as yet it has had no influence either on producers or consumers. The former accept orders at the old figures for almost any quality that a buyer will take, while the consumers appear just as little inclined to increase their orders as they have been for months past. Sales in moderate quantities at about the following prices for Philadelphia, and from 20¢ to 30¢ less for water delivery, or at points such as York, Harrisburg, &c.:

Standard No. 1 Foundry X	$12.00 to $12.50
Standard No. 2 Foundry X	11.00 to 11.50
No. 2 Plain	10.75 to 11.00
No. 1 Soft	11.50 to 11.75
No. 2 Soft	10.75 to 11.00

Business in the Chicago Pig Iron market shows some improvement over the previous week. The sellers of local Irons have been particularly favored in transactions. Quite a number of sales are reported, the largest calling for 1500 tons. Southern Iron represents a much smaller quantity, the sales all told amounting to about 1000 tons. Lake Superior Charcoal has been quiet, with very little doing outside of carload lots. No changes have been made in prices, the quotations on local Irons being unaffected by the recent cuts in Southern brands. Quotations are as follows for cash:

Lake Superior Charcoal	$13.00 to $14.00
Local Coke Foundry, No. 1	10.25 to 10.50
Local Coke Foundry, No. 2	9.75 to 10.00
Local Coke Foundry, No. 3	9.50 to 9.75
Local Scotch	10.50 to 11.00
Ohio Strong Softeners, No. 1	12.50 to 13.00
Southern Silvery, No. 1	11.50 to 11.75
Southern Silvery, No. 2	11.25 to 11.50
Southern Coke, No. 2	10.00 to 10.50
Southern Coke, No. 3	9.75 to 10.25
Southern, No. 1, Soft	10.25 to 10.50
Southern, No. 2, Soft	9.75 to 10.25
Alabama Car Wheel	17.50 to 18.00
Jackson County Silvery	15.50 to 16.00
Other Ohio Silvery	14.25 to 14.50

Production in the Pittsburgh district continues very heavy, and some of the stacks are making exceptionally good records in production. In Foundry Iron the situation is unchanged. The demand is fair, and prices are about as they have been for several weeks past. We quote as follows:

No. 1 Foundry	$10.50 to $10.65 cash.
No. 2 Foundry	9.65 to 9.75 "

In the Cincinnati district contracts, ranging between 1000 and 2000 tons for delivery running through several months, have been offered to Southern furnaces at a shade under quotations, but with the increased business in sight producers are disposed to adhere even more closely to their views of a turn for the better soon, and all offers under the previously current rates have been refused. Northern Charcoal Iron, too, is meeting a better demand with some large trades pending at the moment. Western Pipe works and radiator manufacturers have been among the recent buyers, and Eastern Pipe works are said to be contemplating contracting for round amounts. There is also evidence that small buyers, while not anticipating their wants, to any great extent at least, are not running so close to shore as during the past few months, and as a result there may be less complaint regarding shipments. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.00 to 9.25
Southern Coke, No. 3	8.50 to 8.75
Ohio Soft Stone Coal, No. 1	14.50 to 15.00
Ohio Soft Stone Coal, No. 2	14.00 to 14.50
Lake Superior Coke, No. 1	11.75 to 12.25
Lake Superior Coke, No. 2	10.75 to 11.50
Hanging Rock Charcoal, No. 1	16.00 to 16.50
Hanging Rock Charcoal, No. 2	15.50 to 16.00
Tennessee Charcoal, No. 1	13.00 to 13.50
Tennessee Charcoal, No. 2	12.00 to 12.50

The conditions governing the St. Louis Pig Iron market are practically the same as last reported. Sales have dwindled down to carload quantities with an occasional 100-ton lot. There seems to be a fair consumption, but there is not much inquiry for Iron for future wants. Furnacemen seem to believe that prices at present ruling are as low as they can possibly go and are not pushing sales to any extent, preferring rather to wait and secure the advantage of advance of price, no matter how small. No. 2 Foundry continues to be quoted at $6.75, f.o.b. cars Birmingham. The starting up of two of the local Stove foundries will help increase the consumptive demand. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.00 to $10.25
Southern Coke, No. 2 Foundry	9.50 to 9.75
Southern Coke, No 3 Foundry	9.00 to 9.25
Southern Car Wheel	16.00 to 16.50

Metal Market.

Pig Tin.—The sharp turn upward mentioned in our last week's report has been followed by an almost unbroken decline and shrinkage in wholesale prices, making a weak and depresed market. Probably 300 tons have changed hands in a speculative way and the average quantity has passed into final channels of distribution and into consumers' hands. The downward course of values may fairly be attributed to the natural influence of excessive supplies, assisted by comparatively unopposed "bear" operations of prominent traders. Importations have been heavy, bringing the total for this month to date up to 2307 tons and adding several hundred tons to the spot stock. There are now about 1700 tons afloat, and it is probable that importations will exceed deliveries during the next 30 days. Straits Pig in small retail parcels is quoted at 15¢ @ 15½¢ ℔ lb, the lower figure being the most common.

Copper.—At the lower level of prices established of late there has been more business in Ingots, chiefly purchases by home consumers, deliveries running the next two months. Ingot was offered in large lots at as low as 9.50¢ for delivery during the summer months, but without developing much buying interest. This indication of weak undercurrent to the market is not the only one. Home consumers are extremely conservative, at all events. Export trade prospects are by no means flattering, and production is proceeding at a rate that doubtless causes more or less extensive accumulation of stock in first hands. Jobbers' price for small lots of Lake Ingot from stock is about 10½¢ ℔ lb.

Sheet Copper.—A moderate volume of inquiry is noted; but, although the feeling among consumers is regarded as better, the actual amount of buying is in the aggregate below par. Small lots of Sheet Copper are quoted by jobbers at 14¢ ℔ lb, net.

Pig Lead.—There have been forced sales of a few carloads of Common Domestic, under the influence of which the price went down with very slim results in the way of business. As thus tested, the market is a weak one for sellers. Large consumers seem disinclined to purchase here or in the West except at a lower level of values, and the smaller ones are buying in a hand to-mouth way only, pending developments. As for speculative interest, there appears to be none aside from remnants of old deals. American in small lots from store is quoted at 3⅞¢ @ 3¼¢ ℔ lb.

Lead Pipe and Sheet.—No tangible improvement is to be recorded in the demand for manufactured Lead. Buying is still in the nature of small purchases for present needs alone. Prices in this section are maintained at the list rate, namely, 5½¢ for Pipe and 6½¢ for Sheet, with 20 % discount.

Spelter.—No improvement in the volume of business or in the demand has taken place here. The larger movement is still almost wholly on orders calling for a few carloads at a time or single carloads, and the demand is wholly bare of spirit. Jobbers also report a very tame demand for small parcels, for which they quote 3¾¢ @ 4¢ ℔ lb for Western brands.

Antimony.—The jobbing trade has been fair, but the movement otherwise is still light. Prices remain at about 8¢ for Hallett's and 9½¢ for Cookson's, in small lots from store.

Nickel.—Sellers quote at about 35¢ @ 40¢, according to size of lot.

Tin Plate.—Coke Plates for forward delivery have been the only really redeeming feature of the market during the week. These have met with very fair sale, the requirements of canners in

some quarters being imperative. Spot sales of the same have also been somewhat better. However, the entire dealings are doubtless of very moderate average for this season of the year, and have not been of sufficient magnitude to put any backbone into prices, which still remain somewhat weak and irregular. Bright Charcoals are selling in moderate quantities only, and the demand for Ternes has been greatly restricted throughout the country by the severe weather and the general condition of the roads, &c. The outlet for Ternes is supplied almost wholly by American mills. Advices of severe depression on the other side, accompanied by heavy failures in the Tin Plate trade and the consequent closing down of works, has induced the impression that the restricted production resulting may bring about a stiffening in prices. But the late starting into operation of a strong force of American works is likely to neutralize this.

The condition of the British Tin Plate market is thus described in a special London cable dispatch of February 27 to *The Iron Age:* Tin Plate has continued slow. Transactions limited to small lots, chiefly for Russia and 'Frisco. Only a moderate forward business has been done. Quotations, f.o.b. Wales, are as follows:

Bessemer Cokes, IC 14 x 20	9/	@ 9/1½
Siemens Cokes, IC 14 x 20	....	@ 9/4½
Ternes, 20 x 28	18/	@ 23/
Charcoals, IC 14 x 20	10/6	@ 13/

Sheet Iron.—Spot business in both Black and Galvanized Sheets is quiet, but a large number of orders are being placed with mills for deliveries extending over the next three months. Some makers are, however, refusing to book orders very far ahead at present prices. The demand for light Black Plate for tinning purposes is referred to as excellent. Prices on both Black and Galvanized Iron exhibit no improvement, however. Jobbers' quotations for small lots of No. 27 Common Iron from store rule at about 2.65¢. Galvanized Sheets in similar quantities are quoted at the discount of 75 and 5 % @ 75 and 10 % off.

The United States Geological Survey, C. Kirchhoff, agent, has issued the following preliminary statement of the production of Spelter, the unit being the short ton of 2000 pounds:

Production of Spelter.

States.	1894.	1893.	1892.
Eastern	7,400	8,802	9,582
Southern	1,576	3,882	4,913
Illinois and Indiana	28,972	29,596	31,363
Kansas	25,388	22,815	24,715
Missouri	11,992	13,737	16,667
Totals	75,328	78,832	87,260

A partial statement of stocks shows that stocks increased from 4562 tons on January 1, 1894, to 4911 tons on January 1, 1895.

Chicago Report.

Scrap.—Everything has been quiet the past week. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3 00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½ ¢
Tea Lead	....	2 ¢
Zinc	...	2¼ ¢
Rubber	..	4 ¢

Anthracite. — Business has again lapsed into dullness. Carload lots of 12 net tons or over are quoted as follows, although some concessions are now being made:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$4.75	$5 00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8.10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

CONDITION OF THE

Hardware Trade.

AS FEBRUARY draws to a close some houses report a gratifying increase in the volume of business, while with others trade does not yet manifest marked improvement. Travelers, however, are quite generally on the road, and the result of their efforts is the securing of a number of orders, which for the most part are carefully assorted and not specially large. They, however, in the aggregate undoubtedly cover considerable quantities of goods, and are sufficient to meet the immediate requirements of the purchasers. Both retailers and jobbers are apparently disposed to let the manufacturer carry the stocks from which purchases are to be made as necessary. Prices do not show any material change, and the market continues in a somewhat unsettled condition. Collections are fairly good.

Advices from Chicago.—Shelf Hardware has been affected to a considerable extent by the milder weather. Orders have been very much more numerous within the past four or five days, and the character of goods now in demand shows that outdoor work has begun to be prosecuted with some vigor. Important sections of the Northwest are still ice bound and it will be some little time before general outdoor work is in full swing. The trade has not yet recovered from the demoralization of Wire Nail prices by Chicago jobbers, and this matter will, perhaps, have to be settled before trade gets into a thoroughly satisfactory condition. The outlook continues to improve steadily, however, and jobbers here are looking forward to an excellent month's business in March. The Heavy Hardware trade shows some falling off in consequence of the change from winter weather and the diminished demand for winter goods. Collections have improved.

Notes on Prices.

Wire Nails.—Considering the disturbance which results from the active competition between two of the leading jobbing houses, the Wire Nail market continues in excellent condition, and most of the manufacturers are firmly holding to the advanced prices which for the past week or two have been ruling. There is a good deal of inquiry and negotiation, and a good many orders have been placed. As a result the mills are well occupied for some time to come.

Advices from Chicago.—Large orders have recently been placed by outside jobbers who evidently believe that this is a good time to secure aditional stock for their spring trade. Inquiries are growing better as manufacturers are seen to maintain a firm stand. The carload price has recently been advanced to $1.05 Chicago by manufacturers. This is 10 cents per keg higher than quotations made by two Chicago jobbing houses, who continue to maintain the fight which has been in progress here for the past several weeks. It is claimed that the end of this fight is now drawing near, as their contracts with mills are rapidly being taken out.

Cut Nails.—There has been only a moderate movement in Cut Nails the past week, but the mills report more frequent inquiries and refer to the indications of a fair business as the spring opens. Quotations are unchanged. Small lots from store, in New York, are held at 85 to 90 cents.

Advices from Chicago.—Manufacturers report very little trade in progress. Jobbers quote small lots at $1 from stock.

Barb Wire.—The Barb Wire market is steady, with an increasing volume of business. There is little doubt that the situation would be more completely satisfactory were it not for the disposition on the part of some of the jobbing houses who have large orders in at relatively low figures to undersell the prices which the manufacturers are now disposed to maintain firmly. Small lots of Four-Point Galvanized from store are held at $2.10 to $2.15.

Advices from Chicago.—Manufacturers are enjoying a good trade from many parts of the West and their business steadily improves as milder weather penetrates to more Northern districts. They expect to do a much larger business in March than ever before. The Chicago jobbers who are making low prices on Wire Nails also quote $1.55 for Painted and $1.90 for Galvanized. Small lots from stock are quoted at $1.65 for Painted and $2 for Galvanized.

Pneumatic Pump.—The Pneumatic Wall Pump put on the market by Hulbert Bros. & Co., 26 West Twenty-third street, New York, is sold to the trade at $18 net.

Lawn Mowers.—We are advised by S. A. Haines, who represents the Dille & McGuire Mfg. Company, Richmond, Ind., as manager of sales, that about March 20 they will advance their prices about 10 per cent. They refer to having largely oversold the production of any former year, and make this advance in view of the unnecessarily low prices now ruling on Lawn Mowers.

Glass.—The meeting of the Glass manufacturers held at Columbus, Ohio, on the 21st inst. did not result in any definite action being taken, but was

adjourned to meet at Pittsburgh on February 28. The condition of the market remains unchanged since our report last week, both in regard to prices and demand; while jobbers and manufacturers are awaiting anxiously the developments of the coming spring. New York quotations for American Window Glass in small lots are as follows: Single Strength, 85 and 10 to 85 and 15 per cent. discount; Double Strength Glass, 85 and 20 per cent. discount.

Old Metals.—The demand is still quite moderate, but there are indications of a recovering interest in some quarters which point to probable improvement in business in this line within a reasonable period. Some good orders have been taken by Scrap Iron dealers for certain qualities of Old Iron. Prices show no quotable change, the following quotations representing about the current rates paid by dealers in this city:

Heavy Copper	₱ lb 7 ¢
Light and Tinned Copper	₱ lb 6½¢
Heavy Brass	₱ lb 4¾¢
Light Brass	₱ lb 3¾¢
Lead	₱ lb 2¾¢
Tea Lead	₱ lb 2½¢
Zinc	₱ lb 2⅛¢
No. 1 Pewter	₱ lb 10 ¢
No. 2 Pewter	₱ lb 5½¢
Wrought Scrap Iron, ₱ gross ton	$7.50 @ $8.00
Heavy Cast Scrap, ₱ gross ton	7.50 @ 8.50
Stove Plate Scrap, ₱ gross ton	5.00
Burnt Iron, ₱ gross ton	3.00

Old Rags, Paper, &c.—The market is quiet, demand moderate and business not active. Dealers' purchasing prices remain at virtually the same figures as formerly quoted, nsmely:

No. 1 White Rags	₱ lb 3 @ 3¼¢
No. 2 White Rags	₱ lb 2¼ @ 2½¢
Mixed Rags	₱ lb ¾ @ 1 ¢
Blues and 3ds	₱ lb 1⅛ @ 1⅜¢
Hard Sized White Shavings	₱ lb 2⅛ @ 2¼¢
No. 1 White Book Shavings	₱ lb 1¾ @ 2⅛¢
No. 2 White Book Shavings	₱ lb 1 @ 1⅛¢
Light Book Shavings	₱ lb ⅝¢
No. 1 Mixed Shavings	₱ lb ⅞ @ 1 ¢
No. 2 Mixed Shavings	₱ lb ⅝ @ ¾¢
No. 1 Printed Books	₱ lb 1 @ 1¼¢
Ordinary Mixed Books	₱ lb ½ @ ¾¢
Newspapers	₱ lb 2-5¢
No. 1 Manila Paper	₱ lb ¾ @ 1 ¢
No 2 Manila Paper	₱ lb ⅝ @ ¾¢
Bogus Paper	₱ lb ½¢
Common Paper	₱ lb ¼ @ 3 5¢
Straw Chips	₱ lb ⅜¢
Binders' Clippings	₱ lb ½¢
Jute Butts	₱ lb 1½ @ 1¾¢
No. 1 Jute Bagging	₱ lb 1 @ 1¼¢
Mixed Bagging	₱ lb ¾ @ 1 ¢
No. 2 Bagging	₱ lb ½ @ ¾¢
Hemp Twine	₱ lb 2 @ 2¼¢
Manila Rope	₱ lb 2 @ 2½¢
Jute Rope	₱ lb 1½ @ 1¾¢
Mixed Rope	₱ lb ¾ @ ⅞¢

Old Rubber.—The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots, ₱ lb	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory, ₱ lb	@ .05¼
Rubber Shoes, less than carleads, ₱ lb	@ .04¾
White Wringer Rolls, ₱ lb	@ .03⅞
White Syringes, ₱ lb	@ .03⅞

THE QUICK SHINE COMPANY, St. Louis, have placed on the market a stove blacking which bids fair to prove popular from the fact that it not only blackens the stove but will also polish the nickel. The polish is put up in tin boxes with an attractive label and is advertised as "the best on earth." The mode of operation is to apply it with a damp woolen cloth and rub the parts to which the polish has been applied with a dry cloth. The Donnell Mfg. Company, 612 South Sixth street, St. Louis, Mo., are the distributing agents.

Trade Notes.

THE JOEL HAYDEN BRASS WORKS, at Lorain, Ohio, owned by the United States Brass Company of Connecticut, was sold by the sheriff last week. The appraised value of the plant and 60 acres adjoining was $185,000. The property brought $141,000. The purchasers were Hon. H. S. Hoyt, Charles F. Matthewson and Edgar Woodman, trustees of the bondholders.

THE MUTUAL GAS SAVING COMPANY, for utilizing a patented invention for saving gas, has been incorporated st Bsltimore, Md., by Henry S. Cunnare, Cooper Lyons, John J. Myers, John A. Blondell and Michael A. McCormick, with a capital stock of $50,000.

THE NEW YORK STAMPING COMPANY of Brooklyn received a charter of incorporation this week. The company, whose capital is placed at $30,000, will manufacture metal goods. Directors are James Edgar and W. A. Bardell of Brooklyn, and J. F. Pierson of New York City.

THE LOS ANGELES IRON & STEEL COMPANY of Los Angeles, Cal., recently placed an order for 600 tons of steel billets at Pittsburgh, Pa., to be used in the manufacture of Light Plates and Sheets.

A. C. DALLAS & Co, 79 Lake street, Chicago, have been appointed Western agents for the Benedict & Burnham Mfg. Company, manufacturers of Seamless Brass and Copper Tubes, Brszed Tubes, Sheet Brass, Rods, &c.

FERD. BLEMLY, 151 Fulton street, New York, makes a specialty of fine metal chasing. He is now completing a set of fine brass patterns for a fireplace lining and borders to match. He also does mold making, die sinking, and makes steel, brsss and rubber stamps.

THE WORKS of the Chicsgo Pipe Company, New Philadelphia, Ohio, were burned down on February 28. The loss is estimated at $100,000, partly covered by insurance.

ALUMINUM AND ALLOY METAL WORKS of Peru, Ind., have been incorporated, with a capital stock of $45,000. The directors are James O. Cole, R. A. Edwards, C. C. Emswiller, R. H. Bouslog, W. J. Wilder, L. B. Jenks.

EVEN those who are not in any way interested in buying Ice Cream Freezers should turn over our advertising psges to the announcement of the S. C. Tatum Company of Cincinnati, Ohio, for the pleasure of seeing the three Ethiopians eat ice cream made in the Ohio Freezer.

AMONG the special advertisements to be found in this issue of *The Metal Worker* is one giving a list of tinners' supplies and tools together with the prices. It is a special sale and any tinners or others having use for such materials and machines will be interested in the sale.

The statistics of metallurgical production in Belgium in 1894 show that the amount of pig iron manufactured was 810,940 tons, being an increase upon the previous year of 65,676 tons. Rails and sheets amounted to 122 474 tons, as against 118,602 tons in 1893, and other iron 330,917 tons, as compared with 371,119 tons. The production of steel ingots in 1894 was 396,914 tons, as agsinst 273,113 tons, snd steel rails, sheets, &c., 344,766 tons, as compared with 224,622 tons.

CONTENTS.

	Page.
Edltorials:	
Observation	31
Travel	31
Co-operative Trading in Great Britaln	31
The Letter Box—	
Are Gravel Roofs Durable?	32
Insurance Rates on Gasoline Stoves	32
Heating of Tin Roofs	32
Frozen Wind Mill Tanks	32
Scant Radiatlon	32
Paste for Asbestos Paper	32
Heating Water by Incandescent Lamps. Illustrated	32
Anti-Freezing Mortar	33
A Cold Alr Duct	33
Which Is Best for Furnace Tops?	33
Making an Oil Tank	33
Trouble with Furnace. Illustrated	33
Enameling Gasoline Stoves	33
The Retall Store—	
The Quick Meal Gasoline Stove. Illus	34
The Yankee Sprinkler. Illustrated	34
Kitchen Tlme Table	35
The Comet Lawn Sprinkler. Illus	35
Standard Fiber Ware	35
Steel Mortar and Brick Hods	35
Memoranda	35
Steam and Hot Water—	
Blower Specifications. Illustrated	36
The Mahony Vertical Section Steam or Water Boiler. Illustrated	36
The Popular Hot Water Fire Place. Illustrated	37
Hot Water Heating	38
James D. Mowry	40
Heating Notes	40
Plumbing and Gas Fitting—	
Clarke's Instantaneous Water Heater. Illustrated	41
Association News	41
High Grade Closet Fixtures. Illus	42
Traps and Vents	42
Four-Wheel Pipe Cutter. Illustrated	44
The Hornless Water Closet. Illus	44
Heating and Plumbing—New Work and Contracts	44
Tin Plates—	
Is Overproductlon in Sight?	45
A Modern Tin Plate Plant	45
The Welsh Tin Plate Crisis	46
A New Process of Pickling Metal	46
Scrap	47
Stove Trade Notes—	
Daniel M. Thomas Portrait	48
The Stove Trade of the Ohio Valley	49
Philadelphia Stove Trade	49
The Secretaryshlp of the National Association of Stove Manufacturers	49
Oven Thermometer. Illustrated	49
New York East Side Chat	49
Odd Plates	50
Flashings	51
Star Wrenches. Illustrated	52
Tool Dresser. Illustrated	52
Gas Soldering Iron Furnace. Illus	52
Trade Report—	
The Iron Market	53
Metal Market	53
Chicago Report	54
Condition of the Hardware Trade	54
Notes on Prices	54
Trade Notes	55
Metal and Miscellaneous Prices	56
Labor Exchange—	
Help Wanted	58
Situatlous Wanted	58

Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 28, 1895.

Tin—

Straits pigs.....15½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 25.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade.	IC, 10 x 14	@ 5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX, 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX, 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—IC.	10x14.14x20	@ $4.75
	IC, 14x20.90 ℔	@ 4.25
	IC, 14x20. 100℔	4.50
	10 x 20	7.00
	20 x 28	9.50
	IX, 10x14, 14 x20	@ 6.00
B.V. Grade.	IC,10x14, 14x20	@ ....

Charcoal Plates.—Terne

Guaranteed Plates command specia prices, according to quality.

Mansel and Dean Grades.—	IC. 14 x 20	@ $4.75
	20 x 28	@ 9.50
	IX. 20 x 28	@ 12.00
Worcester Brand and equal.—	IC. 14 x 20	@ 5.25
	IC, 20 x 28	@10.50
	IX, 14 x 20	@ 6.50
	20 x 28	@13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56		$12.50
XX, 14 x 56	25.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.25
IX, 10 x 14, 12 x 12, 14 x 20 6.50

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.50
IX, 10 x 14, 12 x 12, 14 x 20. 7.00

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.00
IX, 10 x 14, 12 x 12. 14 x 20.. 7.50

Usual extraf or other crosses and 20 x 28 cuble these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20.....$5.75
IX, full weight, 14 x 20..... 7.50

Irondale A A:

IC, full weight, 14 x 20..... 5.25
IX, full weight, 14 x 20..... 6.75

Irondale A:

IC, full weigbt, 14 x 20..... 5.00

Irondale B:

IC, 100 lbs., 14 x 20 ..... 4.75
IC, full weight, 14 x 20..... 4.85

Irondale C, IC, 14 x 20, 100 lbs..... 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $4.75
Old Hundred, IC, 14 x 20, 100 lbs.... 4.50
R. W. & B., IC, 20 x 28, 216 lbs 9 50
Old Hundred, IC, 20 x 28, 200 lbs.... 9.00

Roofing Plates.

Palm, IC, 20 x 28.....@$10.00
Palm, IX, 20 x 28..... @ 12.00
Empire, IC, 20 x 28.....@ 10.75
Empire, IX, 20 x 28.....@ ....
Hickory, IC, 20 x 28.....@ 11.50
" IX, 20 x 28.....@ 14.00
Alaska (heavily coated), IC, 20x28@ 13.00
Alaska IX, 20 x 28.....@ 16.00
Special, IC, 20 x 28.....@ 13.00
" IX, 20 x 28.....@ 16.00
Niagara, IC, 20 x 28 ..... 9 50
Iroquois, IC, 20 x 28..... 9.00

Westmoreland:

IC, 14 x 20..... 5.25
IC, 20 x 28..... 10.50

Kenwood:

IC, 20 x 28..... 10.00

Furmston:

IC, 14 x 20..... 4.75
IC, 20 x 28 ..... 9.50

Irondale AA, IC, 14 x 20..... ....
Irondale A, IC, 20 x 28..... 10.50
Irondale B, IC, 20 x 28..... 10.10
Each extra cross $1.50.

Challenge, IC, 20 x 28.....10.50

Jnno:

IC, 14 x 20..... ....
IC, 20 x 28..... ....

Illinois, Old Method:

IC, 20 x 28..... 13.50
IX, 20 x 28..... 16.50

E. L.:

IC, 20 x 28 ..... 10.75
IX, 20 x 28 ..... 13.25

Jessie:

IC, 20 x 28..... 10.25

Old Process:

IC, 14 x 20..... 8.00
IX, 14 x 20..... 9.50
IC, 20 x 28.....16.00
IX, 20 x 28.....19.00

H. B. L., Old Style:

IC, 14 x 20..... 7.00
IX, 14 x 20..... 8.25
IC, 20 x 28.....14.00
IX, 20 x 28.....16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.40

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ ℔ 2 1-10¢	2 8-10¢
17 to 20	₩ ℔ 2 2-10¢	2 9-10¢
21 to 24	₩ ℔ 2 3-10¢	3 ¢
25 and 26	₩ ℔ 2 4-10¢	3 1-10¢
27	₩ ℔ 2 5-10¢	3 2-10¢

Russia, Planished, &c.

	100 lbs.
Patent Planished, ₩ ℔, A	$10.20 } 10%
Patent Planished, ₩ ℔, B	9.20 } dis
Craig's Polished Sheet Steel	8¼¢

Galvanized.

Juniata, or first quality.....dis.75&10%

Copper—

Ingot.

Lake.....16¾¢ @ 11 ¢
Casting Brands.....10 ¢ @ 10¼¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Disconnt on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅜ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅝ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .48
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... .....4¢

Sheet Zinc—

600 ℔ casks.....$4.75
800 ℔ casks,..... 4.95
Loose sheets..... 5.05

Solder—

½&½..... 9¾@10¢
Extra Wiping.....8½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....9@9½¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¢
Pipe.....5¼¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Wrought-Iron Pipe—

1¼ and under, Plain.....70%
1¼ and under, Galv.....34%
1½ and over, Plain.....77%
1½ and over, Galv.....57½%
Boiler Tubes, list Oct. 24, 1892.....68%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....65%
Gordon & Gilbert's Corrugated.....65%
Ritchie's (Galv. Iron only) Cor'd.....65%
Ritchie's Spiral Lock Seam, Galv'd....60%
Austin's Spiral Ribbed Pipe.....65%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....65%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Disconnt from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.10 square
Climax.....$2.90 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.00 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Disconnt from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....8 @ 10¢
Iron Paint, Bright Red.....₩ ℔, 2 ¢
" " Brown.....₩ ℔, 1¼¢
" " Purple.....₩ ℔, 2½¢
" Ground in oil, B. Red ₩ ℔, 6¼¢
" Ground in oil, Red..₩ ℔, 6¼¢
" Ground in oil, Brown ₩ ℔, 5¼¢
" Ground in oil, Purple ₩ ℔, 6 ¢
Linseed Oil, Boiled, in bbls.....60¢
Linseed Oil, Raw, in bbls.....58¢
Mineral Paints.....2@4¢
Orange Mineral.....8¢
Pure White Lead in Oil.....5¼@5½¢
Dry White Lead in bbls.....4¾@5¼¢
Red Lead, American.....5¼@5¾¢
Red Venetian, English, dry .....1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs.....7½¢
Sipe's Japan Oil, in bbls. ₩ gal..... .34¢
Spirits Turpentine, in bbls., ₩ gal. ..35¢
Asphaltum, Trinidad Refined, ₩ ton. $45
Tarred Felt, 1 Ply, ₩ 100 ℔.....$1.40
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.00
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl. of 300 ℔.....$2.80

NEW YORK, MARCH 1, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots.....₩ ℔, 63¢
100-℔ lots.....₩ ℔, 60¢
Ton lots.....₩ ℔, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ ℔, 60¢
100-℔ lots.....₩ ℔, 55¢
Ton lots.....₩ ℔, 58¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ ℔, 55¢
100-℔ lots.....₩ ℔, 53¢
Ton lots.....₩ ℔, 50¢

Antimony—

Cookson .....₩ ℔, 9¼@9½¢
Hallett's.....₩ ℔, 8 ¢

Brass—

Planished..... .....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¾-in. up to 2-in	$0.35
⅜-in. up to ¾-in	.36
½-in. up to ⅝-in	.38
⅜-in. up to ½-in	.41
5-16-in. up to ⅜ in	.48
¼-in. up to 5-16-in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 19, inclusive,	25 @ 30%

Copper and Bronze Tubing—

2¢ ₩ ℔ more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized.....70%
Galvanized, Locked Joints.....70%
Tin.....70%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..18¢ ₩ ℔, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10¼¢
Ansonia Grade Casting.....9¾¢
Planished.....net
Sheet and Bolt.....14¢ ₩ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:
Lap or Slip Joint, Galvanized.....75%
Lap or Slip Joint, Terne.....70%

Eave-Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized..... .....85%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.

Tin.....85%
Galvanized.....85%

Corrugated.

Flat Crimp.

Galvanized.....70%

Round or Square.

Tin.....70%
Galvanized.....70%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔ 2.25	2.60¢
Nos. 17 to 21	₩ ℔. 2.35	2.70¢
Nos. 22 to 24	₩ ℔, 2.45	2.80¢
Nos. 25 and 26	₩ ℔. 2.55	2.90¢
No. 27	₩ ℔. 2 65	3.00¢
No. 28	₩ ℔, 2.75	3.10¢
American B. B.	₩ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ ℔, 11@11½¢
Patent Planished....₩ ℔, A, 10¢; B, 9¢. 5%
Craig Polished Sheet Steel.....₩ ℔ 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75&5@75& 10% off.
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3½@3¾¢
Bar.....4@4½¢
Pipe.....5¼¢ 20%
Tin Lined Pipe.....12½¢ 20%
Block Tin Pipe.....30¢ 20%
Sheet.....6¼¢, 20%
Old Lead in exchange, 2¾¢ ₩ ℔.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....30%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔.....5¾
Lead, Amn. White, in oil..... .. @ 5¼
Lead, Red, bbls. and ½ bbls... .. @ 5¾
Lead, Red, kegs..... .. @ 5¾
Ocher, American..... .. @ 1½
Red Venetian, American..... .. @ 1¾
Linseed Oil:
Raw, ₩ gal..... .. @ .56
Boiled..... .. @ .59
Spirits Turpentine:
In bbls..... .. @ .30
Putty:
In barrels and ½ bbls..... .01½ @ .01¾
In tubs..... .01½ @ .01¾
In tin cans..... .01½ @ .02¼
In bladders..... .01¾ @ .02¼
Roofing Material, &c.:
Asphaltum Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe, " " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—

Galvanized.....50
Tin.....30

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.49@$1.50
Rosin, E. & F.....₩ bbl. $1.55@$1.65
Rosin, G. & H.....₩ bbl. $1.75@$2.05
Rosin, I. & K.....₩ bbl $2.35@$2.55
Rosin, M. & N.....₩ bbl $2.85@$3.05

Seamless Brass Tubes..net

List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.70@ 4.00
Peach Bottom, ₩ sqr.....4.75@ 5.60
No. 1 Chapman, ₩ sqr.....3.90@ 4.25
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.50@ 2.75
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½&¼, guaranteed.....11¢
No. 1.....8½@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 lb, ₩ lb.....3½¢ } 5% dis.
½ bbls., about 300 lb, ₩ lb.....4¢ } 5% dis.
Kegs, about 110 lb, ₩ lb.....4¢ } 5% dis.
75¢ extra for keg.
Kegs, about 55 lb, ₩ lb.....4¢ } 5% dis.

Yager's Soldering Salts.
½-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter.....3¾¢@4¢
Bertha (pure).....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb.....15@15½¢
Straits, pigs, ₩ lb.....15½@15¢
Straits in bars, ₩ lb.....15½@16¢

Tin Plates—

American Terne Plates—

N. B.—The following Terne Plate quotations are for 20 x 28, unless otherwise specified; 14 x 20 Plates are half the prices given below.

Alaska (re-squared) IC.....$13.00
Alderly, extra quality, IC.....10 75
Allegheny, IC.....9.00
" IX.....11.50
Anchor, IC.....8.25
Apollo Roofing, IC.....11.00
" " IX.....13.00
Black Diamond (Extra Coated), IC.....15.00
Bonus (Extra Coated), IC.....11.50
" " IX.....14.50
Boston, IC.....12.50
Brooklyn, IC.....9.00
Capitol, IC.....8.50
Central, IC.....9.00
Climax, IC.....8.75
Columbia, IC.....12 50
" IX.....15 50
Columbus, IC.....9.50
Dunlap's Double Dipped, IC.....15.00
" " " IX.....17.00
" Domestic, IC.....10.00
Empire, IC.....10.25
Eureka, IC.....9.50
" IX.....12.00
Eureka 200 lbs., IC.....9.25
Excelsior, IC.....9.50
Filbert, IC.....14.50
Flag, IC.....8 00
Florida, IC.....9.50
Flushing, IC.....12.50
Freeport (Hand dipped and Resouared).
IC.....13.00
IX.....15.50
F. R. P., Extra, IC.....15.00
Globe, IC.....8 50
IX.....11.00
Golden Star Old Style, IC.....15.00
" " " " IX.....18.00
Grace, IC.....8.50
Hamilton's Best Redipped, IC.....15.50
" " " IX.....18.50
Hickory (Resquared), IC.....11 00
J. L. O., IC.....9.25
Juniati, IC.....11.50
Juno, IC.....11.00
Kensington, IC.....13 50
" IX.....16.00
Knoxall, IC.....9 00
" IX.....12.00
Laufman's Apollo (Resquared), IC.....13.00
Laufman's Apollo (Resquared), IX.....14.50
Leominster, Extra Coated, IC.....11.50
Lion (Stamped), IC.....11.50
Lulu, IC.....10.50
" IX.....13.50
Maple, IC.....11 00
" IX.....14.00
Merchant's Roofing Resquared).IC.....15.00
Meurer's Old Method, IC.....15.00
Meurer Roofing, IC.....14.00
National, IC.....11.00
Nava, IC.....10.00
" IX.....12.50
New Castle Old Method, IC.....18.00
New Castle Palm, IC.....14.50
Old Colony IC.....15 00
Old Method, IC.....13.00
" IX.....16.00
Osborn's Old Process, IC.....14.00
" " IX.....17.00
Osceola, Old Style, IC.....14.50
" " IX.....17.50
Pennsyl Old Method (Treble Coated), IC.....14 00
Phillips' Roofing, IC.....14.00
Phœnix, IC.....9.25
Pullman, IC.....11.50
Republic, IC.....9.50
Scott's Extra Coated (Resquared), IC.....16.00
Scott's Extra Coated (Resquared), IX.....19.00
Standard, IC.....8.50
Star IC.....10.50
" IX.....13.00
Superior, IC.....9.00
Taylor Old Style (Resquared), IC.....15 00
" " " IX.....18.00
The Taylor Roofing, IC.....8 50
" " " IX.....16.50
The Osborn Roofing, IC.....11.50
" " " IX.....14.00
Thomson's Puritan, IC.....14.00
Tip Top, IC (Resquared).....9.75
" " IX.....12.25
Triumph, Old Style, IC.....15.00
" " IX.....18.00
U. S. Monongahela, IC.....12.20
U. S. Redipped, IC.....16.50
Venus, IC.....8 25
Waldo, IC, Hand-dipped.....11.50
Westmoreland, IC.....12.50
Willow, IC.....10 00
" IX.....13.00
Zero, IC.....9.00

American Bright Plates—

Almond, IC, 20 x 28.....$9.00
" IX, 20 x 28.....11 50
Brilliant (Tissue Packed), IC 20x28 15.50
" " IX, 20x28.20.00
Brooklyn, IC, 14 x 20.....5.50
Century, IC, 14 x 20.....5.00
Climax, IC, 14 x 20.....4.75
Excelsior, IC, 14 x 20.....6.50
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....5.50
Florida, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Gladys IC, 14 x 20.....4.50
Hazel, IC, 14x20.....5.50
Ivy, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Linden IC, 20 x 28.....10.00
" IX, 20 x 28.....12.50
Mars, IC, 14 x 20.....4.50
" IX, 14 x 20.....5.50
Merchant's Dipped, IC, 14x20.....10.00
Merion, IC, 20 x 28.....11.00
" IX, 20 x 28.....14.00
Mint, IC, 20x28.....8.50
" IX, 20x28.....11.00
New Castle Best Palm Charcoal, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
New Castle Palm Charcoal, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.00
New Castle, Charcoal, IC, 14 x 20.....6 25
" " IX, 14 x 20.....7.50
New Castle, S. Charcoal, IC, 14 x 20.....6.00
" " IX, 14 x 20.....7.25
New Castle Palm Coke, IC, 14 x 20.....5.75
" " IX, 14 x 20.....6.85
New Castle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Oak, IC, 14 x 20.....4.75
Palma, IC, 14x20.....6.00
Pansy, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.00
Phœnix, IC, 14x20.....5.25
" IX, 14x20.....6.50
Royal, IC, 20x28.....12.00
" IX, 20x28.....15.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Walnut, IC, 14 x 20.....4.65
Youghlogheny, IC, 14 x 20.....6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$6.2
20 x 28.....12.5
Pontymister Old Style Grade, IC, 14 x 20.....5.50
20 x 28.....11.00
IX, 14 x 20.....6.50
20 x 28.....13.00
Worcester Grade, IC, 14 x 20.....4.50
20 x 28.....9.00
IX, 14 x 20.....5 75
20 x 28.....11.50
Dean Grade.—IC, 14 x 20.....4.25
20 x 28.....8.50
IX, 14 x 20.....5.50
20 x 28.....11.00
Abercarne Grade.—IC, 14 x 20.....4.00
20 x 28.....8.00
IX, 14 x 20.....5.50
20 x 28.....11.00
Mansel Grade, IC, 20 x 28.....8.00

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ lb.

Melyn and Calland Grade. IC, 10 x 14.....$5.25
" " IC, 12 x 12.....5.50
" " IC, 14 x 20.....5.25
" " IC, 20 x 28.....10.50
" " IX, 10 x 14.....6.50
" " IX, 12 x 12.....7.00
" " IX, 14 x 20.....6.50
" " IX, 20 x 28.....13.00
" " DC, 12½ x 17.....5.00
" " DX, 12½ x 17.....6.50
Allaway Grade. IC, 10 x 14.....4.75
" " IC, 12 x 12.....5.00
" " IC, 14 x 20.....4 75
" " IC, 20 x 28.....9.50
" " IX, 10 x 14.....5.50
" " IX, 12 x 12.....5 75
" " IX, 14 x 20.....5.50
" " IX, 20 x 28.....1.00
" DC, 12½ x 17.....4.25
" " DX, 12½ x 17.....5.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....4.25
10x20.....6.50
20x28.....8.50
IX, 10x14, 14x20.....5.25
B. V. Grade.—IC, 10x14, 14x20.....4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$11.50
IXX, 14x28..(112 sheets).....11.90
IXX, 14x81..(112 sheets).....18.25

Tinning—Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks, Stove—

Improved Lock Frame, per doz.....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—

List Feb. 1, 1895.
1¼ and under, Plain.....70%
1¼ and under, Galv.....64%
1½ and over, Plain.....77%
1½ and over, Galv.....68%
Boiler Tubes.....75@77½%
Screw and Socket Joint Casing.....65%
Inserted Joints Casing.....60%

Zinc—

600 lb casks.....₩ lb 4¾¢
Per lb.....5¼¢

It Is Reported—

Alabama.

That C. E. Malone, Jr., has just opened a new Hardware store at NEW DECATUR.

That the Stove and Hardware business carried on at DOTHEN, by J. S. Espy & Son, will be hereafter conducted by W. W. Espy.

That Bell & Curtis are a new firm in the Stove, Hardware and Furniture business at BOAZ

Arkansas.

That Benton County Hardware Company have recently purchased the Hardware store of R E. Henry, at SILOAM SPRINGS, and will add it to their branch stock at that place.

That J. W. Newport has recently opened as a dealer in Hardware, Bicycles, &c., at EUREKA SPRINGS.

That Lamberson Hardware Company have succeeded to the business of A. S. Jenkins at AROENTA.

That J L Pearson & Co., Hardware dealers, WOOSTER, have been succeeded by H. Robinson.

That Parker C. Ewan has succeeded T. P. Umstead & Co. in the Hardware and Stove business at DUNN.

That W. R. Hamilton & Co. have succeeded W. R. Hamilton as dealers in Hardware, Bicycles, &c., at BERRYVILLE.

That W. A. Cook of the Foster Hardware Company of LITTLE ROCK has sold his interest to W. C. Foster.

Colorado.

That the Tompkins Hardware & Mining Supply Company of CRIPPLE CREEK have removed to VICTOR.

Delaware.

That Stevens & Slaughter, Hardware, DOVER, have been succeeded by Slaughter & Rice.

Florida.

That L. B. Lee has recently commenced the Hardware business at TAMPA.

That Claxton & Culver is the title of a new Hardware firm, at BARTOW, G. C. Culver of Iowa having bought a half interest in the business of W. R. Claxton.

Georgia.

That H. J. Fite & Co., Hardware merchants, AMERICUS, have removed to new quarters.

That J. J. Ware of the Hardware firm of Ware & McMillan, LA GRANGE, has sold to his son his interest in the business.

Illinois.

That A. R. Solle has succeeded V. M. Barbour in the Hardware business at CHICAGO.

That Oliver McNulty is now carrying on the Hardware business at CAIRO, formerly conducted by his father, the late John McNulty, by whom it was established 22 years ago.

That M. P. Brewer has bought the interest of J. J Green in the Hardware business at PROPHETSTOWN.

That Mueller & Krautwurm, Hardware dealers, CHICAGO, have been succeeded by C. Mueller.

That C. W. Kessler, Hardware merchant, OQUAKA, has sold an interest in the business to Mr. Chant of MENDON.

That J. Augsburger is successor to the Hardware firm of Augsburger & Nafziger, HOPEDALE.

That the E. A. Keller Company, EDWARDSVILLE, have been incorporated. The capital stock is $15,000.

That Peter Ackerman's Hardware store at FRANKLIN GROVE was burned out on the 26th ult.

That M. G. Stevens, MAZON, has sold a half interest in his Hardware business to Perry Stiffler.

That a new Hardware store will soon be opened at MOLINE, in which Willard Baker, John Sessions and others are interested.

That Lehman & Engleshall are a new Hardware firm at LISLE.

That Irving Lattin's Hardware store at BRADFORD was burglarized a few days since. The loss is estimated at $250.

That F. Moehle, dealer in Hardware, Stoves, &c., and George F. Tscharner, dealer in Farm Machinery and Vehicles, OKAWVILLE, have consolidated their interests under the firm style of Moehle & Tscharner.

Indiana.

That James Branson, Hardware, &c., FARMERSBURG, has been succeeded by Branson & Renshaw.

That A. P. Harris of PARIS has bought the Hardware store, at CHRISMAN, conducted by Scanling Bros.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

Manufacturer of a complete line of combination hot air and hot water furnaces; also full line of stoves and ranges. gas and oil stoves, would employ a SALESMAN on liberal commission basis for Chicago and suburbs; must be posted in furnace business; give age and references. "Commission," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 2

A Cbicago manufacturer wisbes services of a reliable middle aged warebouse man who is familiar with tbe stove and casting business and acquainted with Chicago retail stove dealers; also capable of assisting in taking orders an sbipping stoves, and can read and write intelligently; give references. Box 77, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 2

A good TIN and SHEET IRON WORKER for inside and outside work; steady work and fair wages to the rigbt man. Conley Bros. Oneida, N. Y. Mar. 2

Two first-class PATTERN MAKERS who are thoroughly conversant with stove work; none but experienced and capable men need apply. D. H. Nation, foreman pattern department, Excelsior Mfg. Company, 1440 North Main street, St. Louis, Mo. Mar. 2

An A1 man, who thoroughly understands gasoline goods on commission; none but first-class men need apply; a handsome profit for the right party. "G. C. H.," 88 Congress street E., Detroit, Mich. Mar. 2

I will give a good, all around TINNER an interest in my well-established business; must understand roofing, spouting, furnace work and shop work; want a man who is sober and capable of handling the entire business; no money or tools required, but must be honest and show good reference. Lock Box 241, Garrett, Ind. Mar. 2

A first-class man who can do first-class work at both steam heating and plumbing; a steady job and good pay. Geo. A. Antbum, Biddeford, Maine. Mar. 2

To sell bot water and steam boilers; must be a man baving good tecbnical knowledge of tbe business; must be an approved salesman, accustomed to the road, and have special knowledge and familiarity witb Western trade. Gurney Heater Mfg. Company, 163 Franklin street, Boston, Mass. Mar. 2

A first-class TINNER and PLUMBER at once; steady job to right man; state wages expected No. 16 Lock Box, Wiconisco, Pa. Mar. 2

One or more first-class TRAVELING SALESMEN for each of the States of Iowa and Minnesota, to sell an A1 line of tinware, both plain and anti-rust, with some fast selling specialties to same trade, on commission; goods and prices guaranteed right. W. A. Judd, Clifton Springs, N. Y. Mar. 2

A first-class TINSMITH on ware, to manufacture Model milk coolers; one that can take some stock. H. W. Gazlay, Cortland, N. Y.

SALESMEN to sell as side line tbe best steel roofing in the market, witb a line of corrugated material, or good reliable men as general agents to operate States; no better product offered to the trade; good opportunity; send reference. Lock Box 205, Canton, Obio, Mar. 2

First-class PLUMBER with a license, to take charge of plumbing business in New York City. This is a grand opportunity to the right man. "B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 23

A first-class PLUMBER, HOT WATER and STEAM FITTER; work will be more planning and iron piping; must have good references, be temperate, and from New England; state age, married or single, and wages wanted. Wm. Nourse & Son, Newport, N. H. Feb. 23

At once, a first-class TINSMITH who can do a good job at plumbing, and give estimates on work; must be sober; the right man can secure steady work; state wages. The Clark & Jacobs Hardware Company, Danielsonville, Conn. Feb. 23

An A1 SALESMAN for hot air furnaces for Boston and suburbs; one who is acquainted with architects and builders. "A. & B.," office of *The Metal Worker*, 96-102 Reade street. New York City. Feb. 23

SALESMAN to sell tin and terne plates as side line in West and Northwestern States; give experience. Box 79, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 23

SALESMAN to sell as a side line, on commission, heater pipe, elbows, stove pipe and elbows, skylights, cornices, &c., galvanized leader, eave trough. Paterson Heater Pipe Company, 238 Straight street, Paterson, N. J. Feb. 23

SITUATIONS WANTED.

By a young man (25), with eight years' practical experience in the stove and heater business; good typewriter and understands bookkeeping; not afraid of hard work; best of references. "B. B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2

By a STOVE IRON PATTERN FITTER capable of taking charge of iron fitting shop and competent of doing correct work. "Stove Fitter," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2.

By a practical CORNICE and SKYLIGHT MAKER; first-class cutter and draftsman; understands estimating on work; capable of taking charge of shop and handling any number of men; can do all classes of hammer and raising work by hand; steady position; moderate wages; would take charge of shop or work at tbe bench; New York City or Brooklyn preferred. "J. C. T.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2

BY TINSMITH and GENERAL WORKER, at inside and outside work; city or country; fair knowledge of plumbing and steam fitting; best of references. Benj. W. Roberts, Box 467, Seymour, Conn. Mar. 2

By a party located in Water street, New York, correspondence with manufacturers who wish to be represented in and around New York City by a responsible party; hot water boilers, radiators. stoves, ranges; anything tbat appertains to the heater and range trade. "Manufacturers' Agent," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2

By a TINNER; married man of 25 years; temperate habits; would like steady job; understands tre tin and iron trade in all its branches; has worked some fr m plans; good on furnace work; general jobbing; Michigan only. P. O. Box 258, Davison, Mich. Mar. 2

By a first-class PLUMBER, who is also a good tinsmith and thoroughly understands range, beater and pump work; can estimate from plans; steady employment desired. "Industrious," office of *The Metal Worker*, New York City. Mar. 2

By a PLUMBER, TINSMITH and ROOFER' a good general jobber, also understands beater, range and furnace work; 22 years of age; city or country. Louis Katz, 150 Clinton street, New York City. Mar. 2

By a practical and competent TINSMITH; understands pipe fitting, pumps, stoves, &c.; capable of doing ary work that comes to a jobbing shop; references given; no objection to going a distance. P. O. Box 394 East Pepperell, Mass. Mar. 2

By a first-class TIN, COPPER and SHEET IRON WORKER; good at all branches; also first-class on country work; steady job wanted; city or country. B. Maurer, 63 Lewis street, New York City. Mar. 2

By a good TIN ROOFER and GENERAL JOBBER; sober, steady and reliable; willing to work for moderate wages to have steady employment; Newark or vicinity preferred. Will L. Russell, 2 Linden Block, Middletown, N. Y. Mar. 2

BOOKKEEPER, young man, 24 years, of good business ability, and experienced in tbe stove and sheet iron business, desires positlon witb a bardware concern, clerical or as salesman; A1 reference; small salary accepted. "C. F. P.," 153 North Tenth street, Philadelphia, Pa. Mar. 2

An experienced NICKEL PLATER wishes to engage with some reliable firm; can furnish best of reference; wages moderate. George Wright, 107 Ferry street, Troy, N. Y. Mar. 2

TINNER having experience in selling hardware, desires employment after March 1. W. H. Blair, care of Park Hotel, Columbus, Ohio. Mar. 2

By a TINSMITH who is a practical roofer, jobber and general workman, steady and temperate; can clerk in store; 15 years' experience; city or country. Thos. Reardon, 330 Exchange alley, New Orleans, La. Mar. 2

As SUPERINTENDENT or FOREMAN by a first-class draftsman and cutter in a cornice and roofing sbop; understands estimating on all kinds galvanized iron and c pper work; can give the best of references. Address "Cutter," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2

By young man in stove line as SHIPPING CLERK or SALESMAN; bas had an experience of 15 years; tboroughly acquainted with tbe trade; also well posted in gas and gasoline line. E. LAWRENCE, care A. Keller, 129 Beekman street, New York City. Mar. 2

By a first-class PLUMBER, who is bandy at steam fitting; city or country. John W. Stroud, 224 East 107th street, New York City. Mar. 2

By a man 33 years of age who thoroughly understands tin, sheet iron, steam and hot air furnace work, with a fair knowledge of plumbing; strictly temperate and capable of taking charge; best of reference from former employers. "X," care of P. M., Warren, Mass. Mar. 2

SUPERINTENDENT or FOREMAN by a practical iron molder; 29 years' experience in a foundry where plumbers' cast iron and sanitary ware are made; thoroughly understand the latest improvement in making cast iron pipe and fittings, the match plate system for the same and the process of making white porcelain enamel for all kinds of plumbers' cast iron and sanitary ware; best of reference. "Sanitary," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2

By a PLUMBER, city or country. D. H. Wright, 413 West 125th street, Box D, New York City. Mar. 2

By a young man as PLUMBER and GASFITTER; good jobber; wages moderate. A. Zach, 718 Second avenue, New York City. Mar. 2

By an all-around man, at roofing, conductor and cave trough work, iron piping, furnace work, general jobbing; fair knowledge of plumbing; sober, married; a steady job wanted. P. R. Baker, Pleasant Valley, N. Y. Mar. 2

By a young man 24 years of age who has had experience in all branches of the tin and sheet iron trade; first-class man; steady work desired; city or country. F. W. Farabaugh, 202 Nortb Sixteenth street, Philadelphia, Pa. Mar. 2

As FOREMAN in a tin and sheet iron shop wbere heating and ventilating is the principal work; 25 years' experience; can estimate and work from architects' plans, cut all patterns required and get out work as economical as it is possible to be done: references furnished; will go on trial either as foreman or superintendent until parties can satisfy themselves as to my abilities. "Competent," care F. Riviere, 29 Liberty street, Newark, N. J. Mar. 2

By two experienced men in the line of tin and hardware; one has had years of experience; would work in shop or store, or take charge of same; the other is a strong, practical man; good on furnaces; both can furnish good references. M. F. Sherman, Avoca, N. Y. Mar. 2

By a young man, 24 years of age; six years' experience at tin and sheet iron work; also indirect steam heat work; single; strictly sober; would correspond with any one baving a responsible position to be filled. "A. R. D.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2

By a first-class TINSMITH; also a good PLUMBER; references; city or country. Harry Rosenbloom, 3 Forsyth street, New York City, Mar. 2

By a practical PLUMBER, STEAM and HOT WATER FITTER; would like to engage with some house as salesman or clerk; understand the stove and range business; best of references as to honesty and sobriety. "A. H.," care of Wm. Hill & Sons, plumbers, 103 West Thirty-sixth street, New York City. Mar. 2

By a first-class PATTERN FITTER who can also do mending and fitting; can give first class references. "J. C. L.," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. Mar. 2

By a PLUMBER; city or country. W. Chandler, 277 West 127th street, New York City. Mar. 2

By practical TIN and SHEET METAL WORKER; also practical hot air furnace setter; can furnish tools and machines. John Gerkin, 1728 Graceland avenue, Indianapolis, Ind. Feb. 23

By a first-class PLUMBER and PIPE FITTER; strictly sober and steady, with years of experience; having been in business, can do estimating; would prefer work in New York or New England States. "Plumber," Box 603, Great Barrington, Mass. Feb. 23

Twelve years' experience in the heating, plumbing and general hardware business; competent to estimate from plans; able to superintend steam, bot water or furnace work; I wish to secure a position in some growing town or city where ability will count; can give first-class references; have been with one concern 12 years. "Work," office of *The Metal Worker*, 96-102 Reade street, New York City. Feb. 23

As TINNER, HELPER or GENERAL MAN in a hardware, stove, tin store or shop; four years' experience; best of references; sober, reliable and steady. "Jack the Tinner," 319 Main street, Keokuk, Iowa. Feb. 23

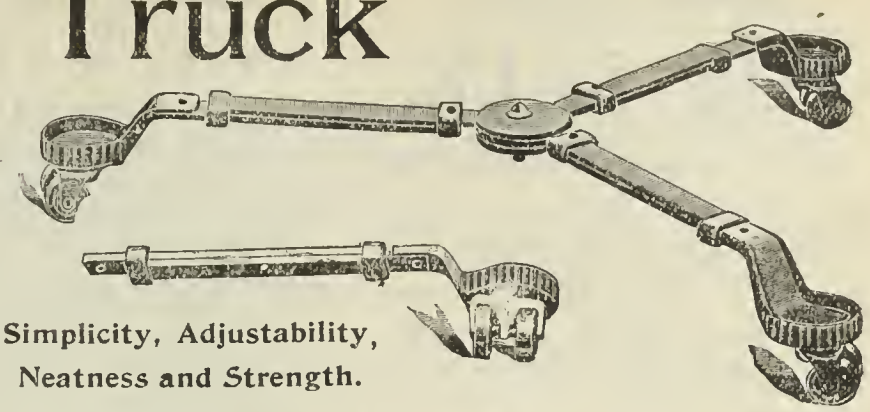
By a TINSMITH and GENERAL WORKER, at inside and outside work. Joseph Gleacher, 3150 Third avenue, New York City. Feb. 23

Gem Stove Truck

Not only accommodates itself to a stove with four legs, but, as shown in illustration, is equally as complete with a stove of three legs, a feature no other truck possesses. The adjustment is so perfect that one man can mount any ordinary stove with ease. Price, $30.00 per dozen. 1-3 doz. in neat case.

DISCOUNT TO THE TRADE.

Address **CHAS. F. FOX, - DAYTON, O.**



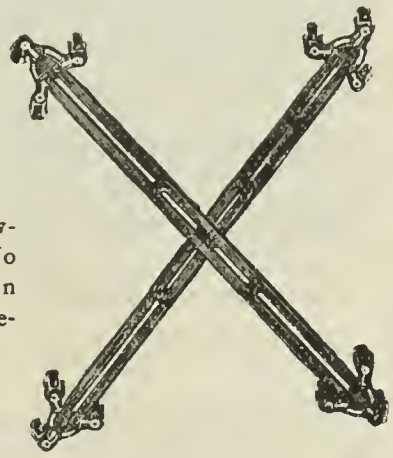
Simplicity, Adjustability, Neatness and Strength.



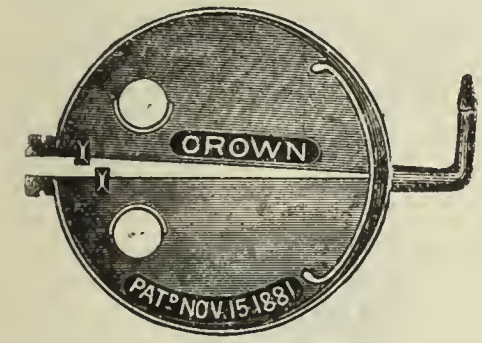
THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

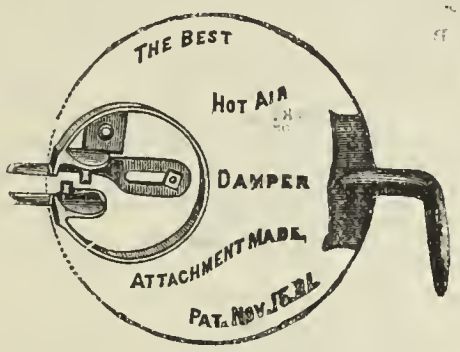
MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.



Crown Damper and Crown Damper Attachment.





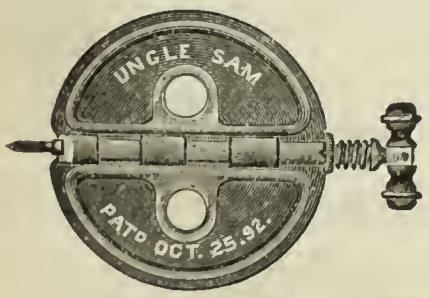
NICKEL PLATED HANDLE. **PUT UP 1 DOZ. IN A BOX.**

——MADE BY——

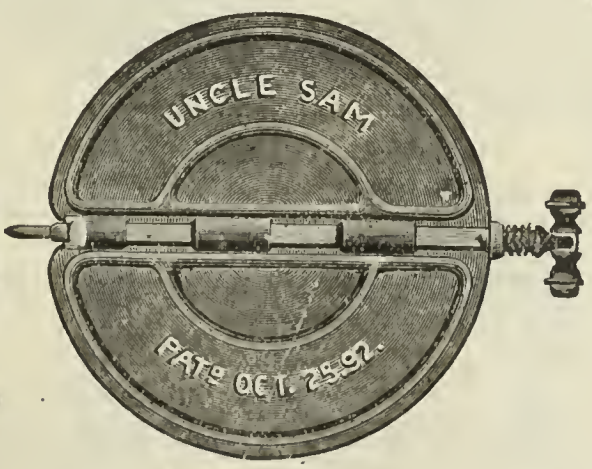
W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers



SOMETHING NEW.

The Little Giant Steel Truck. Strong, Light.

ENTIRELY OF

METAL AND AT A VERY LOW PRICE.

Write for Circulars and Prices to the Manufacturers,

THE G. L. VAN NAMEE MFG. CO.,

Gouverneur, N Y., U. S. A.

— THE luxury of modern traveling costs a great deal of money. A dining car of the most approved pattern costs $15,000 to build. Next come the kitchen utensils, the table furniture, the silverware and linen—averaging about $3000 to a car. Each car must have a steward, who usually gets $100 a month, a head cook, who values himself at $75 a month. There must also be one or two assistant cooks and three or four waiters. Three hundred dollars a month is the very smallest outlay for wages, while the cost of raw food material, breakage of dishes and the board of employees is about $3000 per month additional. An average five days' run costs nearly $600 for food and service, so that it would take forty persons at every meal on the run to pay the daily expenses, without allowing anything for interest on the investment, or for wear and tear on the furnishings.—*The Evening Sun.*

— SAFEGUARD FOR THE FUTURE.—A girl should be given an allowance every week, if it is not more than fifty cents. It will teach her how to handle the great sums intrusted to her care when she marries. —*Atchison (Kan.) Champion.*

— A MEAN TRICK.—Patrick was one of those witty sons of the Celtic Isle whose amusing sayings had entertained many transatlantic travelers.

One day, when the steamer was about leaving port, Patrick received the order to haul in a long cable that dragged astern. Patrick jumped to the task cheerfully enough, and hauled away contentedly. But the excessive length of the cable taxed his patience.

"I wonder what's become of the end of this ould cable, anyhow?" And finally, growing impatient, he growled out: "Fath, it's no use hauling away at the baste uv a cable Some divil's cut the end off uv it."—*Harper's Magazine.*

— HARRY: "I understand she gave you a flat refusal?" Jack: "Yes; nothing under a four story brown stone would satisfy her."—*National Standard.*

Special Notices.

FOR SALE.

A prosperous general Plumbing and Heating business. Established 40 years, in an Eastern city of 15,000 inhabitants. Volume of business $60,000 per annum. Stock and capital required small. Address

"PROSPEROUS," No. 32,

office of *The Metal Worker*, 96 102 Reade St., New York.

WANTED.

Line Hard Coal Base Burner for season '95 by stove manufacturing company not making them, to handle in connection with their own, who thoroughly and actively canvass the territory of Ohio, Indiana, Michigan, Illinois and Wisconsin. Address

"HARD COAL,"

office of *The Metal Worker*, 96 102 Reade St., New York.

FOR SALE or TO RENT.

Stove, Tin and House Furnishing business for sale. Established over 25 years. The only shop in the vicinity. The stock of goods can be reduced to suit the customer. A first rate chance for a young man. A good two-story store and shop, public hall above. A first-class two-story dwelling next door. Close to depot and post office. Satisfactory reasons given for wanting to sell. Address "W. B.," Lock Box 171, Pine Plains, N. Y.

Wanted To Buy At Once.

A House Furnishing, Stove, Tin and Plumbing business within a radius of one hundred miles of New York City. Address

"CASH,"

office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

1 20 inch Bar Folder, 1 encased Wiring, 1 Burring, 1 Turning up Machine. P. S & W. make. Correspond quick. IRA C. EWING, Avonmore, Pa.

WANTED.

One second hand No. 2 Moore's Double Seamer, also one Beil Edger. Both must be in good condition. State price. Address A. WATSON, East Liverpool, Ohio.

MECHANIC WITH 26 YEARS' EXPERIENCE in Tin business, understands boilers, machinery, drawing, stamping, drop forging, tinning and galvanizing, practical man, inventor of tools and machinery, wants position as superintendent. First-class references. Address "MECHANIC," office of *The Metal Worker*, 59 Dearborn St., Chicago.

FOR SALE.

A full set of iron patterns, all fitted, for manufacturing Numbers 14, 16, 18, 20, 24 Round Oak Stoves, latest improved designs. Also three sizes Cannon Stoves, all fallow boarded. Address

MARSHALL FURNACE CO., Marshall, Mich.

FOR SALE.

First-class set of Tinners' Tools. Price, $225 cash. Inquire of

JOSEPH F. HAINES, Rogers City, Mich.

WANTED.

To open correspondence with parties in Chicago or West who can handle Hot Air Furnaces and Hot Water Heaters in carload lots. Goods of Eastern manufacturer and well known. Address

"HOT AIR,"

office of *The Metal Worker*, 96-102 Reade St., New York.

Special Notices.

FOR SALE.

2656 feet 7 x 96 IX Terne Eave Trough	4 ¢ per foot.
3400 feet 8 x 96 IX Terne Eave Trough	4¾ " " "
918 feet 4 x 72 IC Terne Eave Trough	2½ " " "
125 feet 4 x 60 IC Terne Eave Trough	2½ " " "
424 feet 4 x 56 IC Terne Eave Trough	2½ " " "
60 feet 4 x 56 IC Bright Eave Trough	3 " " "
144 feet 4 x 96 Galvanized Gutter, Style "F"	7 " " "
180 feet 96 in. Galvanized Gutter, Style "K," 24 inch sheet	.16 " " "
14 dozen 4 inch Tin Spouting Elbows	.75 " " doz.
2 dozen 4 inch Galvanized Fixed Elbows	.60 " " "
7 4 inch Tin Richmond Cut Offs	35 " each.
1 48 " Star Ventilator	$3.00 "
1 2 " IXL "	.30 "
3 3 " " Ventilators	.45 " each.
5 4 " " "	.50 " "
3 5 " " "	.75 " "

BRADBEER COWLS.

2 - 3 - 4 - 5 - 6 - 9 - 10 - 12 inch

3 - 4 - 9 - 3 - 6 - 4 - 2 - 2 at..... List less 80%

STEPHEN'S CHIMNEY TOPS.

1 each 4 - 4½ - 5½ - 6 - 8 - 9 - 10 - 12 in. List less 80%
27 6 inch Galvanized Chimney Tops 40¢ each.

RICHMOND HANGERS.

3½ - 4 - 4½ - 5 - 5½ - 6 inch

1 - 1¼ - 2 - 2½ - 1 - 1 gross, at.. List less 25%
16 pair Punches for Richmond Hangers 25¢ each less 25%.
861 lbs. Drip Pans, assorted sizes.....4¢ per lb.

SECOND-HAND MACHINES.

1 No 2 Beader, with wood stand	$8.00
1 No. 2 " complete	15 00
1 No. 3 " 1 pair rolls	8 00
1 No 5 " complete	8 00
2 Wiring Machines with wood stand	2.00 each.
2 Common Standards	.75 "
1 pair No 0 Bench Shears	8.50
1 Pander's Circular Shear	7 00
1 No 1 Savage's Patent Rotary Shear, with Burring attachment	12.00
1 20 inch Improved Grooving Machine	10 00
1 No. 2 Moore's Double Seamer	5.00
1 Van Bramer's Bail ormer	4.50
2 Cast Iron Fire Pots	50 each.

NEW MACHINES.

1 Buckman's Square Pipe Former	$14 00
1 Slitting Machine, gauge to 4 inches	0.00
1 No. 3 Niagara Beader, complete	20 00
1 Niagara 4 Head Stake, 2 heads only	3.85
1 Burton's Double Seamer	18 50
1 No 3 Moore's Double Seamer	12.25
1 Smith's Patent Oval Handle Former	4 50
1 No. 0 S. P. Former, 2 inch, 37 inch rolls	16.00
1 No. 2 Stow's Patent Gutter Beader.	3 00
1 Woodhead's Seam Closer	15 00
1 28 inch Burritt's Cross Lock Seamer	36.50
1 Bell's Edger, common gauge	22 00
1 Bell's Edger, wide gauge	22.00
1 28 inch Spangler's D. L. Edger, 2 rods	15.00
2 sets Spangler's Roofing Seamers, common gauge	15.00 each.
1 set Spangler's Roofing Seamers, wide gauge	15.00
2 sets Spangler's Roofing Seamers, adjustable	15 00 each.
10 Lyle's Cleat Formers	1.00 each.
1 Quadruple (4 sides at once) Roofing Folder	70 00
1 Little Wonder Punch	15 00
3 Punches, each 3 16, ¼, for Little Wonder Punch	.35 each.
1 Coachmaker's Vise, 4 inch jaw	6.25
3 Manneer's Drills	3.00 each.
1 No. 66 Buffalo Drill	7.00
2 No. 2 Stonemason's Hammers	.60 each.
2 2 inch, No. 2 Steel Squares	.60 each.
6 6 inch Compasses	.20 each.
1 set 3-16 Steel Letters	5.00
20 Buttle's Fire Pots	1.75 each.

BRUCE & COOK,

190 Water Street, New York.

FOR SALE.

No. 7 Sturtevant Blower, only short time in use. Address

EUGENE MUNSELL & CO., 218 Water St., New York.

BARGAIN.

On account of death, a set of Peck & Stow Tin and Roofing Tools for sale at a big bargain for cash, to settle the estate Write at once to ED. BLIZZARD, Wauseon, Ohio.

FOR SALE.

Cast Iron Patterns of Furnaces, Ranges and Fire Place Heaters as follows: 11 sizes Furnaces, 4 sizes Ranges, 1 size Fire Place Heater. Address

ALVA HUBBARD & CO., Baltimore, Md.

Special Notices.

FOR SALE.

The leading stove store in a growing manufacturing city of 20,000, near New York. This is an old, and the best business stand in the city. Large store and moderate rent. We do Steam and Hot Water and Hot Air Heating, Plumbing and Tinning. This is a good investment, but present owner has too much other business to see to. Can inventory down to $3000. Address "A. A.," No. 119 office of *The Metal Worker*, 96-102 Reade St., N. Y.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

FOR SALE.

Patent Steel Roofing, with the necessary tools for applying electros for advertising, &c. Trade established. Good opportunity now open. Reasons can be given on application. Address

"COLUMBIA,"

office of *The Metal Worker*, 96 102 Reade Street, New York.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

The Williams Printing Co.,

Commercial Printers, and Binders.

Estimates Furnished for all Classes of Work.

96-102 Reade St., - New York.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

G. & J. R. BOLTON HEATERS. New Home HOT AIR FURNACES.

HOT WATER. STEAM.



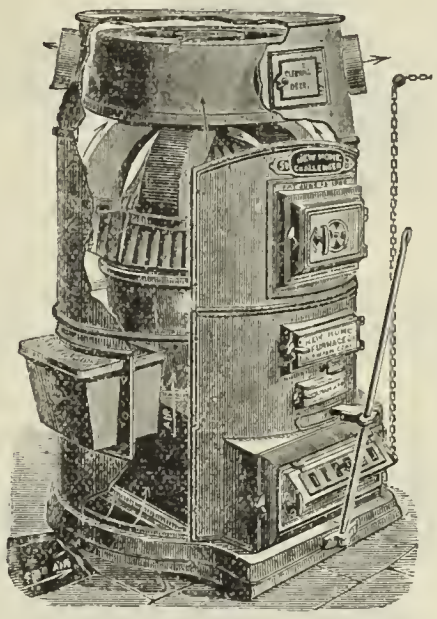
The Foskett & Bishop Co.,

MANUFACTURERS.

The Best Heating

Apparatus in the World.

SEND FOR PRICES, ETC.



NEW HOME FURNACE CO.,

NORWALK, CONN.

SALESROOM:

George H. Raymond, Manager, 114 Liberty St., New York.

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address

"STOVE FOUNDRY,"

Office of *The Metal Worker*, 96-102 Reade Street, New York.

Salesmen's Report Blanks.

More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.

PATENT PRACTICE EXCLUSIVELY

References Furnished on Application

E. B. STOCKING, Attorney at Law,
611 F ST., N. W., WASHINGTON, D. C.

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,

Solicitors of Patents.

OFFICES:

PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row.
WASHINGTON,
Atlantic Building, 928 F. St.



This little Torch is 4 in. high and 1¼ in diam. and is designed to do away with the greasy candle. Will burn gasoline or kerosene oil.

Sold by All Jobbers.

Kendrick Valve & Washer Co.,

SYRACUSE, - N. Y.



The largest and best assorted stock in America. All requisites for the draughting room. We have made a study of this line and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable.

CATALOGUE ON APPLICATION.

Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10 inches, Cloth. Price, $3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

CONTENTS:

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Sauce pans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set fo Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS,

Publisher,

96-102 Reade St., NEW YORK.

SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING.

WITH THIRTY-FIVE ILLUSTRATIONS.

43 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

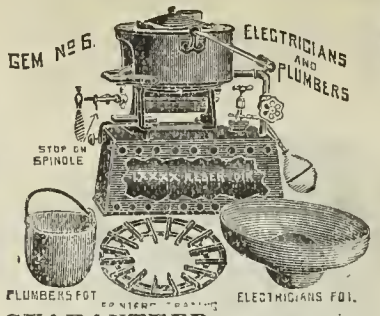
The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published

Sent, post-paid, on receipt of price, 25c

DAVID WILLIAMS,

PUBLISHER,

96-102 Reade St., New York



BURGESS GEM No. 6.

Electricians', Plumbers' and Tinners' Furnace.

GUARANTEED to melt 12 pounds of lead in eight minutes.

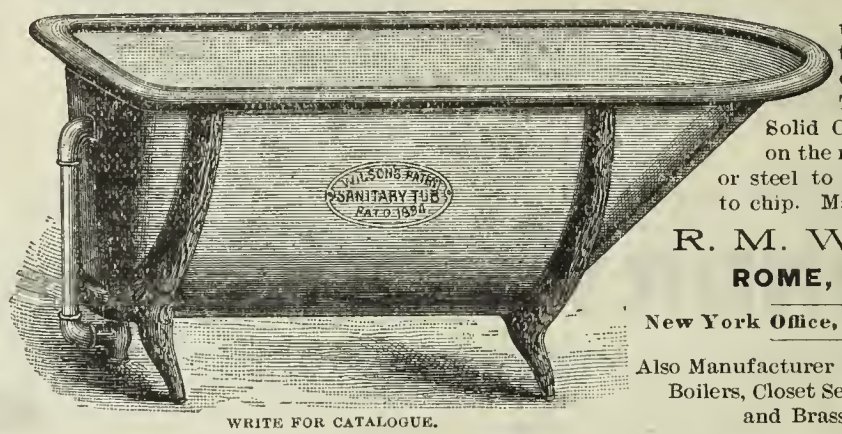
GUARANTEED to heat coppers and melt lead at the same time.

GUARANTEED that if it cannot be worked out of doors or on roofs in all kinds of weather your money will be refunded.

MANUFACTURED BY **Burgess Soldering Furnace Co.,**

COLUMBUS, OHIO.

R. M. Wilson's Solid Copper Bath Tub.



WRITE FOR CATALOGUE.

Success assured to all who handle the Wilson Patent Sanitary Bath Tub. The only Solid Copper Bath Tub on the market. No iron or steel to rust. No enamel to chip. Manufactured by

R. M. WILSON,

ROME, N. Y.

New York Office, 92 Walker St.

Also Manufacturer of Copper Range Boilers, Closet Seats and Tanks and Brass Work.

POCOCK'S ECCENTRIC

FORMING MACHINE.



We invite your attention to this new Former for Tinners' and Sheet-Metal Workers' Rolls, on which we claim rapidity of operation, superior construction and durability. The back roll is moved by eccentrics instead of screws, and can be changed instantly from the smallest circle to the passing of a straight sheet. It will flare metal easier and better than any other machine in use. You can get closer to front roll, therefore bend a smaller circle. For sale by all leading jobbers. Send for circular to

O. POCOCK, Mfr.
363, 365, 367 Clark St.
CINCINNATI, OHIO.

3-inch Rolls with Slip Rolls a specialty

At this time of the Year

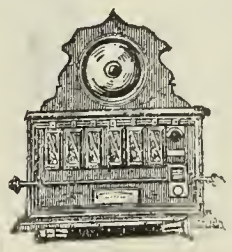
metal workers are busy fixing furnaces, steam pipes, etc. Dixon's Graphite Pipe Joint Grease will make a better joint than red or white lead and parts can be separated easily even years after. When used on valves it does not harden or cause the valves to stick. Send for circular and sample.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

MAPLE SYRUP CAN and SAP BUCKET STOCK.

We are now prepared to quote and ship promptly. Get our prices before buying.

J. M. & L. A. OSBORN, - - - CLEVELAND, O.



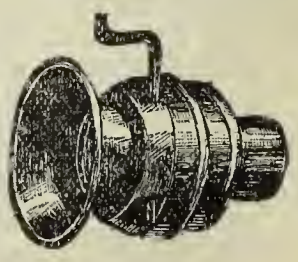
W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.

Manufacturers of

Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application



We Accept the Challenge

$1000

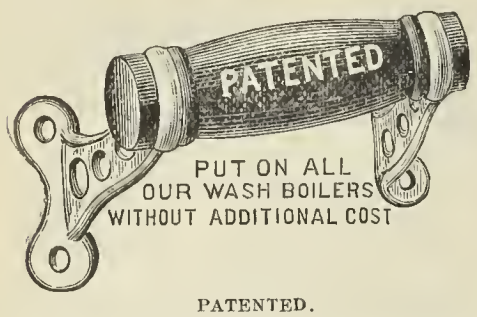
NASHUA, N. H., FEB. 28, 1895.

We have claimed in good faith that cream can be frozen in the "Improved" WHITE MOUNTAIN FREEZER in FOUR MINUTES. This, we maintain is *one-half* the time required to produce like results with any other Freezer on the market.

One of our esteemed competitors has "*Challenged the Claim*" that we have made, and now, as an evidence of our good faith, we hereby offer to deposit the sum of ONE THOUSAND DOLLARS with the publisher of THE IRON AGE, to be forfeited absolutely and by him contributed to any Charitable Institution in the United States in case we fail to prove before any disinterested committee of three persons, each and every statement we have made, either publicly or privately, relative to the matter under consideration, provided, however, that our competitor will deposit an equal sum, and subject to same terms and conditions as mentioned above.

The White Mountain Freezer Co.

ROYAL
WASH BOILER HANDLE.



PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,
116 N. 2d St., PHILADELPHIA, PA.

The Crystal Valve Oil Can.



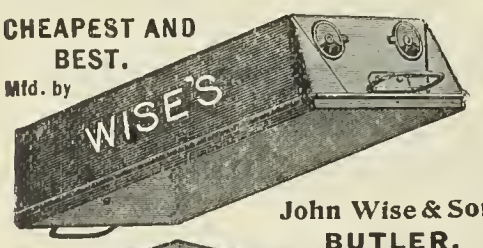
The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O,

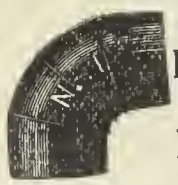
CHEAPEST AND BEST.
Mfd. by



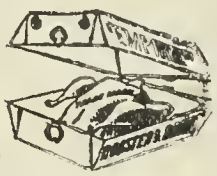
John Wise & Son,
BUTLER,
O.



NEW YORK ELBOW CO.
18 Cliff St., N. Y. City.



Makers of
Elbows
AND
Roasters.



THE TRIUMPH COOKER,
WITH LOCK COVER.
STEAMLESS, ODORLESS AND NON BOIL-OVER.
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.



A GREAT SELLER. Retailers are invited to send for prices. Jobber's discount allowed to first-class dealers.

THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN.

Leather and Rubber
WASHERS,

Machine cut, at less price than can be cut by hand send sample for prices.

I. G. MARSTON & CO.,
200 Ruggles St., Boston, Mass.

COLUMBIAN
ENAMELED STEEL WARE






Before.


After.

Covert Pants Stretcher.

THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

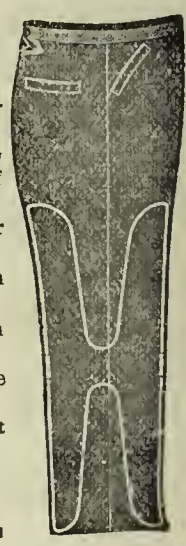
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

MANUFACTURED ONLY BY

COVERT MFG CO., West Troy, N. Y.

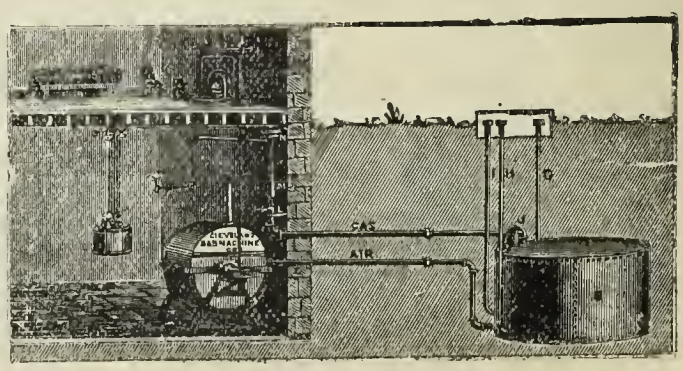


CLEVELAND GAS MACHINE CO.

82 Champlain St., Cleveland, Ohio.

Please send for **Reduced Price** List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engines.



THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

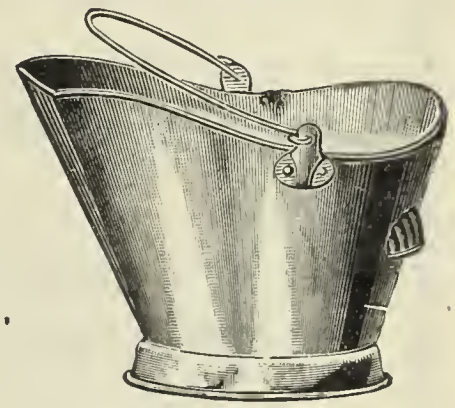
—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

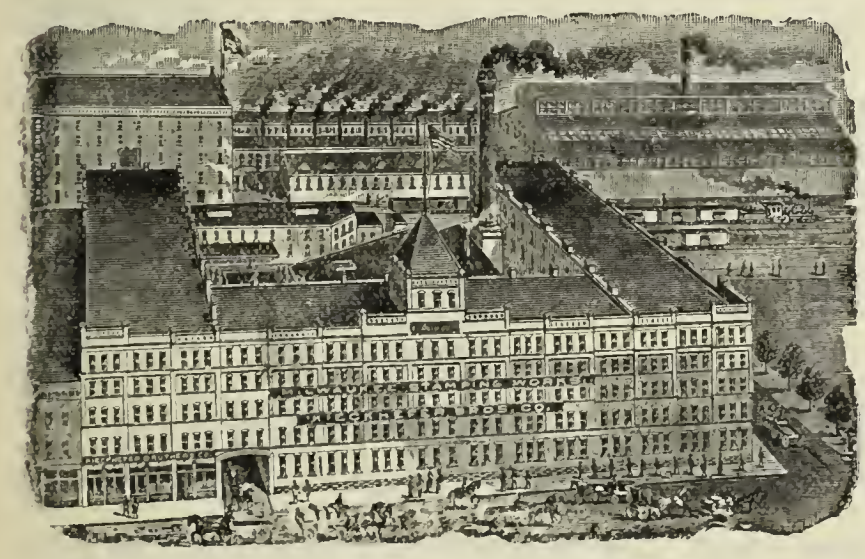


Agents for SPLENDID OIL COOKING STOVES
and MAJESTIC OIL HEATING STOVES.

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED,
JAPANNED AND ENAMELED
PIECED AND STAMPED
Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.

American

WAFFLE IRONS

The Best for Gas or Gasoline Stoves Easy to Clean. Long Wood Handles.

Buy no Other.



"ERIE" HOLLOW WARE LEADS, ALL OTHERS FOLLOW.

ALSO COMPLETE ASSORTMENT OF

FULL NICKEL PLATED WARE,

UNSURPASSED IN FINISH.

"ERIE" ALUMINUM CAST WARE,

THE FINEST WARE EVER MADE. IT WILL PAY YOU TO HANDLE IT.

NEW GOODS FOR SPRING TRADE.

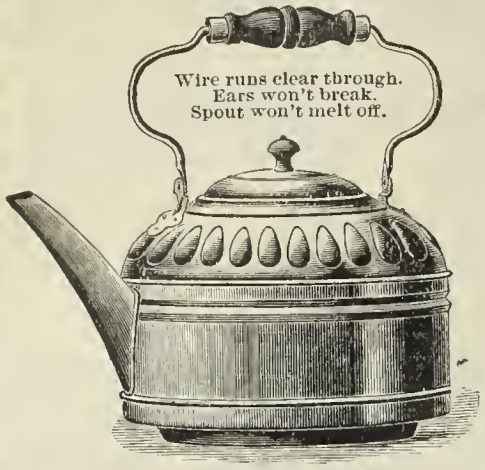
SEND FOR NEW CATALOGUE.

Try our Improved Double Broiler for Gas or Gasoline Stoves.

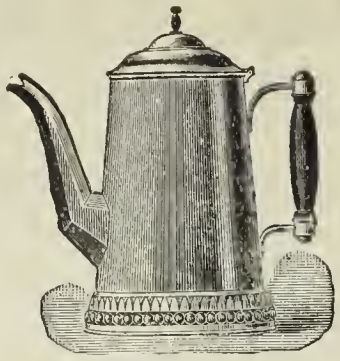
GRISWOLD MFG. CO., Erie, Pa.



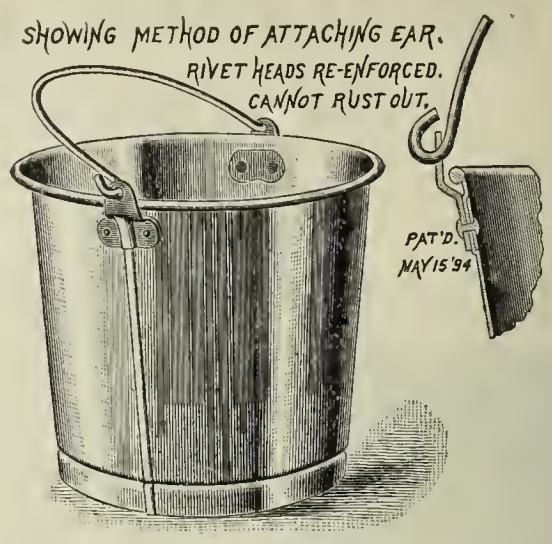
"ERIE" ALUMINUM.



LATEST "ROCHESTER."
Patent pending.



"ROCHESTER."
Patented.



WRITE FOR OUR

It is full of Good Things !

1895

CATALOGUE.

One of these will last a lifetime !

WILL BE A GOOD YEAR IF YOU HANDLE **"ROCHESTER"** GOODS.

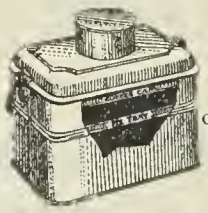
LARGEST LINE. LATEST PATTERNS.

NOTE.—It has always been our aim to furnish the **best goods** at prices which are as low as is consistent with first-class workmanship.

Have you seen our new line of **"extra heavy"** nickel plated copper tea kettles? They will help hold your trade. **White satin finish inside.**

ROCHESTER STAMPING WORKS, - - ROCHESTER, N. Y.

Acme Dinner Pail.



Improved. Best in the world.

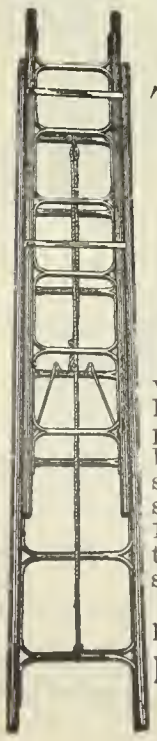
Has a full brass ear and cover fastener combined.

Fully protected by patents.

Sold by first-class dealers everywhere. Write for prices.

MANUFACTURED BY

TRETHAWAY BROS., Parsons, Pa.



Look at this Ladder.

THE PATENT BENT RUNG LADDER.

The Strongest, Lightest and Best Ladder Made.

A sixteen-foot ladder only weighs 21 pounds. Extension ladders of this kind are easily put up and taken down by a boy. Our double and single step ladders have no equal. A six-foot step ladder will carry 1000 pounds, and will last three times as long as the old style step ladder.

Write for catalogue and price-list.

Indiana Ladder Co.,

INDIANA, PENNSYLVANIA.

We Carry Stock and can Supply all Kinds of

ALUMINUM

Sheets, Ingots, Wire, Rods, Etc.

WE ARE MANUFACTURERS OF

ALUMINUM KITCHEN UTENSILS,

Which are Fast Displacing Enameled Ware.

Aluminum Ware does not rust or flake off and is very durable. Foods cooked in it do not scorch. Light and beautiful. A line which will interest every customer and please every purchaser.

SIDNEY SHEPARD & CO., BUFFALO and CHICAGO.

C. W. WELLS, New England Sales Agent, 19 Pearl St., Boston.



ALUMINUM

Ingots, Sheets, Rods, Tubes, Wire and Castings,
Cooking Utensils and Tableware,
Tea and Coffee Pots, Chafing Dishes, Rice Boilers, &c.
Write for New Catalogue.

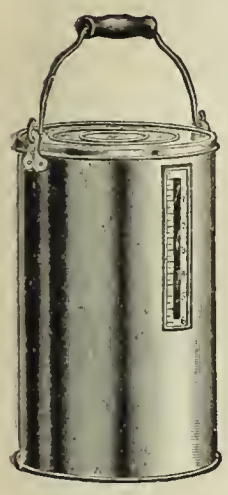
THE WOHLER ALUMINUM COMPANY,

55 Jackson Street, - - - - Chicago, Ill.

CREAM CANS

. . . AND . . .

Cream Can Trimmings.



Cream Cans

With Plain Covers.
With Deep Covers.
With Extra Deep Covers.
Self Locking.

Fairmont Cream Can Gages.



Cream Can Trimmings.

CreamCanB ttoms—IX, IXX, IXXX.

Cream Can Covers—Plain, Deep, Extra Deep.

Self Locking Trimmings—Ears and Lugs; Ears, Lugs and Bails.

The Geuder & Paeschke Mfg. Co.

Manufacturers,

MILWAUKEE, WISCONSIN.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

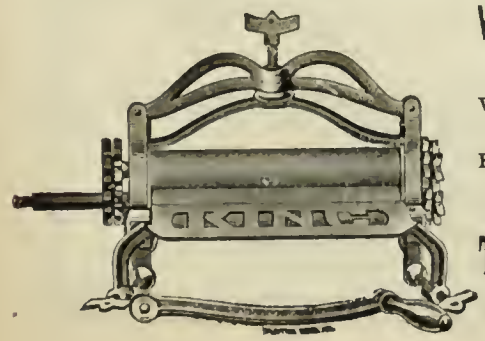
A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces. Length, 10 inches. Can be sold in all seasons.

Write to Manufacturers for Prices.



WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

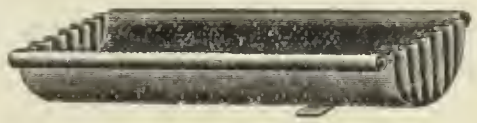
Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr
Boston Office, H. F. Livermore & Co., 34 Oliver St.

"We are Advertised by our Loving Friends."



Pat. Jan. 19th, 1895.

Look Here,

Hardware and Housefurnishing Dealers. An article you **must** keep is the wonderfully popular

Crusty Bread Pan.

The most perfect bread baker ever made. Every lady trying it acknowledges that. **Tests make customers** for this pan, and **that is a fact.** The Clark-Sawyer Co., a big Department Store of Worcester, Mass., say: "They are a good thing, and will make their own way, if people can be made to give them a trial." Your jobber must be in the list below. Write them for prices. They all carry this popular pan in stock.

MADE ONLY BY

The Niles Mfg. Co.,

NILES, OHIO.

HIBBARD, SPENCER, BARTLETT & CO., HORTON, GILMORE, McWILLIAMS & CO., Chicago, Ill.
WM. FRANKFURTH HARDWARE CO., JOHN PRITZLAFF HARDWARE CO., Milwaukee, Wis.
FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.
R. D. CONE CO., Winona, Minn.
A. F. SHAPLEIGH HARDWARE CO., St. Louis, Mo.
RICHARDS & CONOVER HARDWARE CO., Kansas City, Mo.
WYETH HARDWARE & MANUFACTURING CO., St. Joseph, Mo.
THE GEORGE TRITCH HARDWARE CO., Denver, Colo.
EMPKIE-SHUGART CO., Council Bluffs, Iowa.
SICKELS, PRESTON & NUTTING CO., Davenport, Iowa.
A. BALDWIN & CO., Limited, New Orleans, La.
FITTEN-THOMPSON HARDWARE CO., Atlanta, Ga.
PHILLIPS & BUTTORFF MANUFACTURING CO., Nashville, Tenn.
STRATTON & TERSTEGGE, Louisville, Ky.
THE F. H. LAWSON CO., Cincinnati, Ohio.
VAN CAMP HARDWARE & IRON CO., Indianapolis, Ind.
STANDART BROTHERS, Detroit, Mich.
THE GEO. WORTHINGTON CO.,
THE McINTOSH-HUNTINGTON CO., Cleveland, Ohio.
L. H. SMITH WOODEN WARE CO., Limited, Pittsburgh, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
CHARLES MILLAR & SON, Utica, N. Y.
BARKER, ROSE & GRAY, Elmira, N. Y.
SHIELDS & BROTHER, Philadelphia, Pa.
C. S. MERSICK & C New Haven, Conn.

THE "OHIO" ICE CREAM FREEZER.

(Gooch's Patent.)

A WONDERFUL SUCCESS.

The Greatest Improvement ever made in Freezers.

IT IS WORTH LOOKING UP.

Improvements are being made in all lines of manufacture. Why not in Ice Cream Freezers?



"TICKLED TO DEATH."

To the Trade:

We are making the "OHIO" Ice Cream Freezer, which is new and good, of full size and excellent finish. It is far superior to any other. It works to perfection and pleases everybody.

Nothing like it in the market. We have undertaken the manufacture of this Freezer on account of its great merit. If you deal in Freezers you would like to see it. **Send for a Sample.**

The S. C. TATUM CO., Cincinnati, Ohio.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

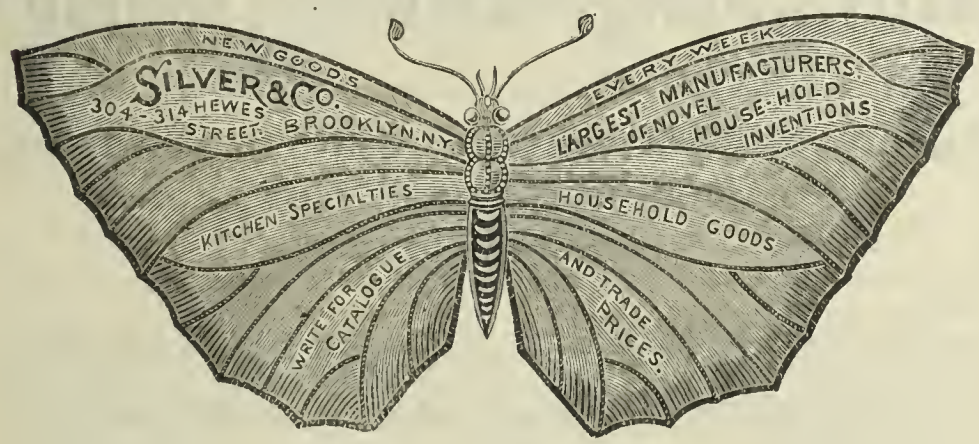
Write us for Catalogue and Prices.



ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.



EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES.

"MARION HARLAND" Tea and Coffee Pots and Urns.

Royal and Crown Roasters and Bakers.

Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses, Steam Cookers, Milk Sterilizers, Bread and Cake Pans, Display Stands and Household Novelties.



N. Y. NICKEL PLATING & MFG. CO.

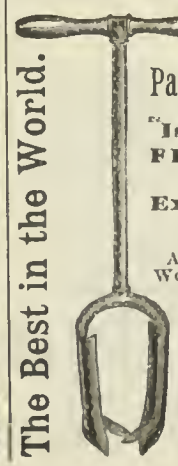
227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

The Best in the World.



IWAN'S

Pat. Improved Post Hole Auger

"IS CONVENIENT and EFFECTIVE IN OPERATION.

Excellence of Material and Construction.

Awarded Medal and Diploma at the World's Columbian Exposition, 1893.

For sale by all leading jobbers in the U. S. and Canada.

IWAN BROS.,

SOLE MANUFACTURERS,

STREATOR, - ILL.

When In Need of

FINE STOVE PLATE FACINGS,

Write to the **originators** and **headquarters** for prices and trial samples.

THE S. OBERMAYER CO., - - - - Cincinnati, O., and Chicago, Ill.

MANUFACTURERS OF

Foundry Facings, Supplies and Equipments. Importers and Refiners all grades Plumbago.

Catalogue and special circulars sent on application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 in.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

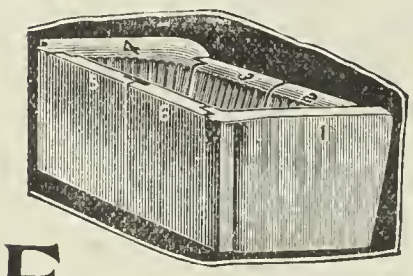
Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

McLEOD & HENRY Co.
TROY
N.Y.



Fire Brick Linings A SPECIALTY.

Established 1866.

EDWARD L. CALELY,

STOVE PATTERNS

TO ORDER.

945 Ridge Ave., PHILADELPHIA, PA

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE CONNECTICUT PLATING CO.,

No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work. Estimates cheerfully submitted.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

STOVE REPAIRS.

Our repairs are sure to fit, as they are made from manufacturers original patterns

MICA.

219 Locust St., St. Louis.

A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH

WHEN HE SAYS THAT THE

RUTLAND LINING

FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.

M. D. VALENTINE & BRO. CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

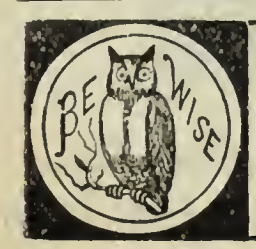
WOODBRIDGE, N. J.

"FIRESTONE"

Has proved I self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.



SELF LUBRICATING

Rotary Screw Ventilators

WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

46 Cortlandt St., New York

☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

415 North 2d St., - - - Philadelphia.

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works.

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.



— THE —

KELLY SHOWER BATH RING.

Patent Applied For.



It Will Produce Better Results Than a $100 Shower Bath.

For particulars write

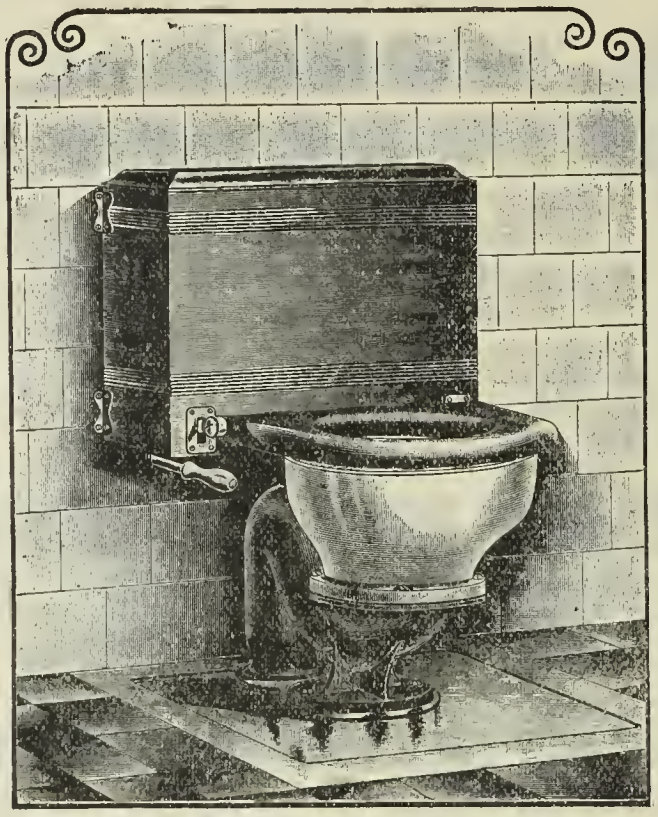
Thos. Kelly & Bros.

Manufacturers of Permanent Plumbing Goods,

124 Franklin St. CHICAGO.

AN IMPORTANT FIXTURE.

A new Water Closet for Hospitals, School Houses and Public or Private Buildings.



THE

Puritan Wash-Down Water Closet.

PATENTED.

WHY THE PURITAN WASH-DOWN IS BETTER THAN ANY OTHER FORM OF CLOSET.

It is simple and compact. The Tank being connected directly to the closet does away with unsightly pipes on the wall and reduces the noise to a minimum. and at the same time being more effective. and has a larger surface of water. The joint where the earthenware connects with the soil pipe is under water, which is an absolute safeguard against the leaking of sewer gas. It is especially adapted for fire proof buildings. and the soil pipe can run on the floor either in front or behind the partition. There is no chance for stoppages and there are no concealed spaces, all parts being accessible.

The body of the closet is made of vitreous or non-absorbing ware and is perfectly sanitary.

GOOD FIXTURES ARE CHEAP, AND POOR FIXTURES ARE EXPENSIVE.

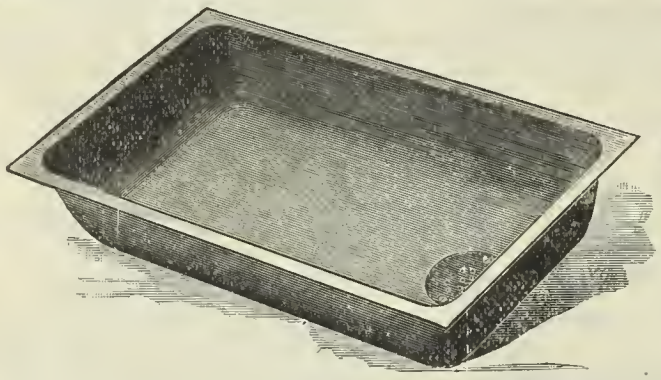
Each Closet is guaranteed for a term of years. Call and see the operation of the Closet at our **SHOW ROOM.**

DALTON-INGERSOLL COMPANY,

169 to 175 High Street (Fort Hill Square), Boston, Mass.

CHICAGO BRANCH : 65 Washington St., Institute of Building Arts.

NEW YORK AGENCY : C. Hoffman, Jr., 277 Pearl St.

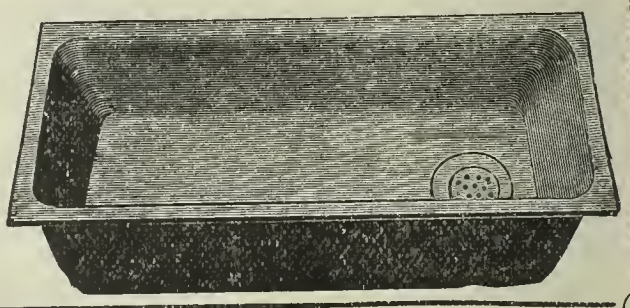


Made of

Wrought Steel

they cannot break

and are superior in many ways to the old cast sinks. They are not porous, hence non-absorbent, and are in consequence free from smell and filthiness, etc.; light, cheap and made in all sizes and finishes. Write for price.

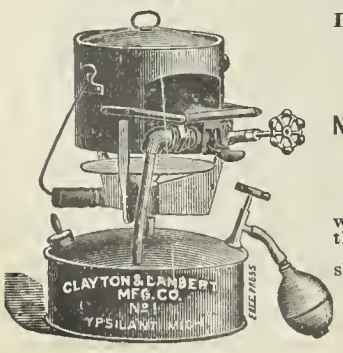


THE

Kilbourne & Jacobs Man'fg Co.

Columbus, Ohio, U. S. A.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

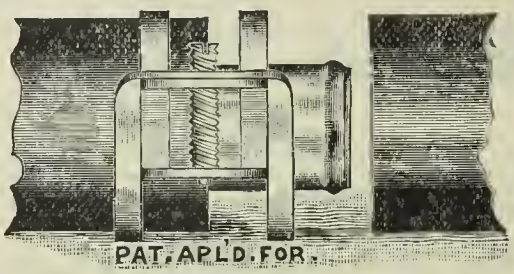
They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.

Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screwdriver being all the tools needed to apply it.



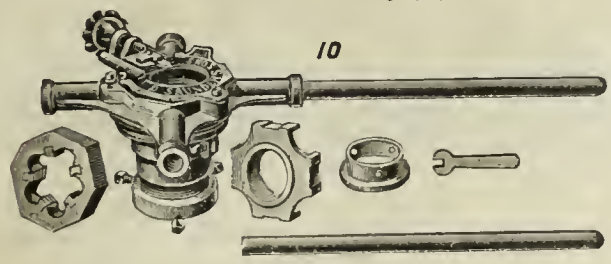
Mender tubes are seamless brass, give full water way, are easily inserted and will not rust Sold by Jobbers everywhere Write for circular and *free sample*

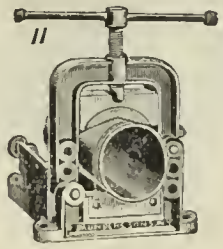
Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.

D. SAUNDERS' SONS,

Manufacturers of





DIE-STOCKS AND VISES

FOR **LARGE PIPE.** These stocks have *CUTTING OFF ATTACHMENT,* and both Vises and Stocks are Malleable Iron. Light, strong and of superior design and finish; also *PIPE THREADING MACHINES* ¼" to 16", Tapping Machines, &c.

Send for Catalogue to

27 Atherton St., YONKERS, N. Y.

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

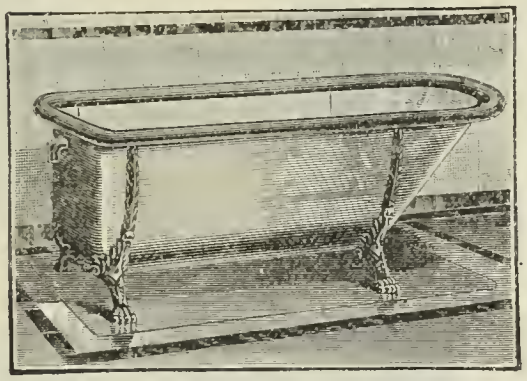
INEXPENSIVE.

It is so lined that it will not crack, nor split; neither can it rust.
No trouble at all to keep it clean, for it cannot harbor dirt nor vermin. It is an open sanitary fixture, no wood but the rim; unbreakable, light, artistic, low priced.
Don't buy an imitation—get the **Steel Clad.** All plumbers and jobbers have it, or the

STEEL CLAD BATH CO. OF NEW YORK,
447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,
Detroit, Mich.
GEORGE BOOTH, President.

Better than the high priced ones, for a low price. Many styles and sizes, only one quality—the best.



Gray Iron Castings,

Cheap Heating Stoves,
Diamond Thimbles.

S. CHENEY & SON,

MANLIUS, N. Y.

DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.



The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.
Write for catalogue and discounts

MADE BY
THE DAY MFG. CO.
Detroit, Mich., U. S. A.



USE "OUR OWN" BASIN PLUGS.

NO OTHER LETTERING ON THEM.

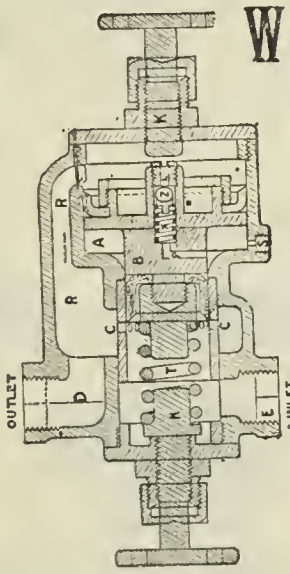
SAMPLE DOZEN ASSORTED $1.

Best Quality. Handsomely Nickeled.

H. O. CANFIELD,
MANUFACTURER OF
Moulded Rubber Goods,
BRIDGEPORT, CONN.



— MRS. HIHILL: "Mary, take Fido from the room at once."
Mary: "Sure, mum, he is having an illegant toime."
Mrs. Hihill: "Yes, but I am afraid the children will teach him their rude ways."
—*Exchange.*



W. G. Taafel's Pressure Regulator.

Send for Price-List

NEWARK REGULATOR COMPANY
Newark, Ohio.

GLOBE SOLDERING FURNACE.



The Tinners' and Plumbers' Wonder.

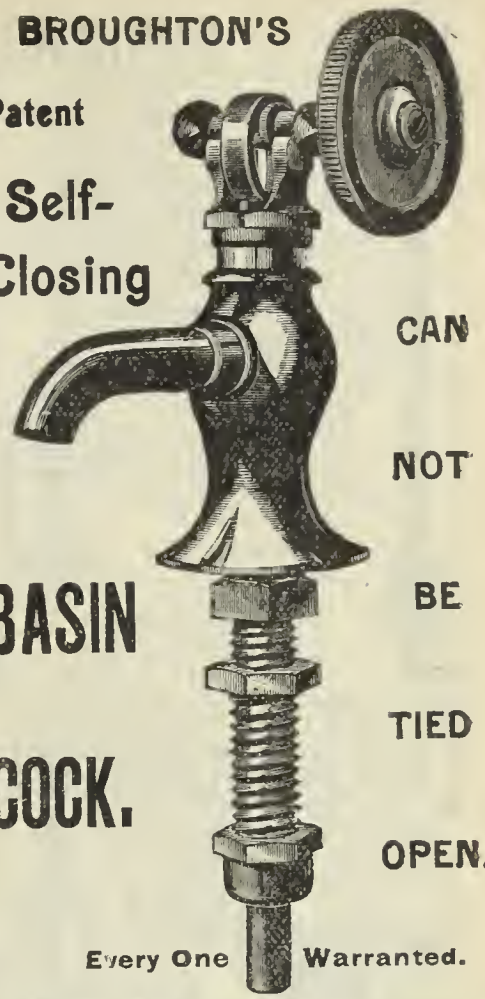
Saves half the fuel, melts quicker, and is easier operated than any other.

Works indoors and out equally well.

Write for Prices.

COUCH BROS. MFG. CO., DAYTON, O.

BROUGHTON'S Patent Self-Closing BASIN COCK.



CAN NOT BE TIED OPEN.

Every One Warranted.

Stebbins Mfg. Co., BRIGHTWOOD, MASS.,
SOLE MANUFACTURERS.

Helper Fire Pot

FOR PLUMBERS' AND TINNERS' USE.

A Combination of Fire Pot and Torch.



The only pot where the burner is on a swivel and patented.
The only fire pot with 16 gauge brass tank
All our goods guaranteed.

SEND FOR CATALOGUE.

UNION HEATER SUPPLY CO.,
88 Congress St, East, Detroit, Mich.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 39th Street, NEW YORK.

LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers
IMPROVED SANITARY WATER CLOSETS.
Wrought Iron Pipe of all sizes cut to order.



CHUCKS The National
All sizes and styles. Patented
Reversible Jaws. Illus. catalogue.
The standard Chuck since 1882.
Address W. WHITLOCK,
39 Cortlandt Street, New York.

W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

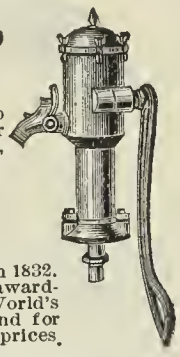
85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON,

156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS

REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS

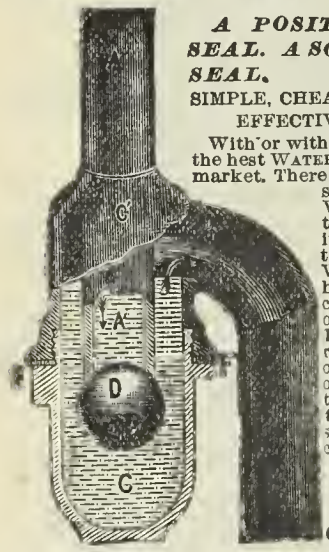


Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.

THE BOWER

SEWER GAS TRAP.



A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

SIMPLE, CHEAP.

EFFECTIVE and DURABLE.

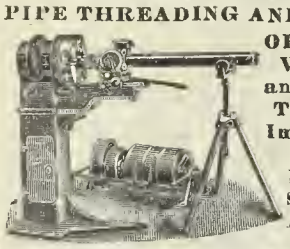
With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 48-page pamphlet sent free on application.

B. P. BOWER & CO.

Manufacturers,

Cleveland, Ohio

PIPE THREADING AND CUTTING OFF MACHINES, WATER, GAS and STEAM FITTERS' TOOLS,



Improved Hinged Vises,

Pipe Wrenches,

Stocks and Dies.

Acknowledged to be the Best.

ARMSTRONG MFG. CO.,

N. Y. OFFICE: 139 Centre St.

Bridgeport, Conn.

PAT'D 1892

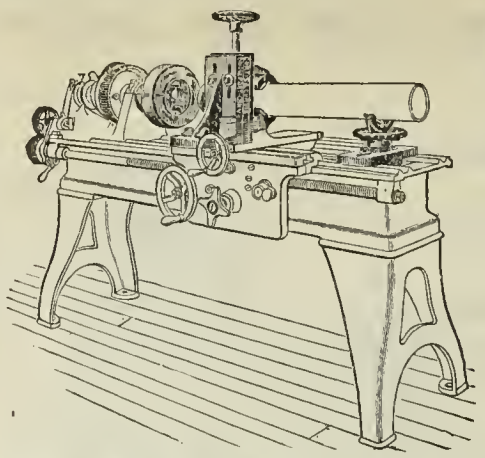
CORRUGATED CONDUCTOR HOOKS AND TINNERS' SUPPLIES

SEND FOR CATALOGUE

59 NTH 2ND ST

L. D. BERGER. PHILADA PA

Pipe and Bolt Threading Attachment for Lathes



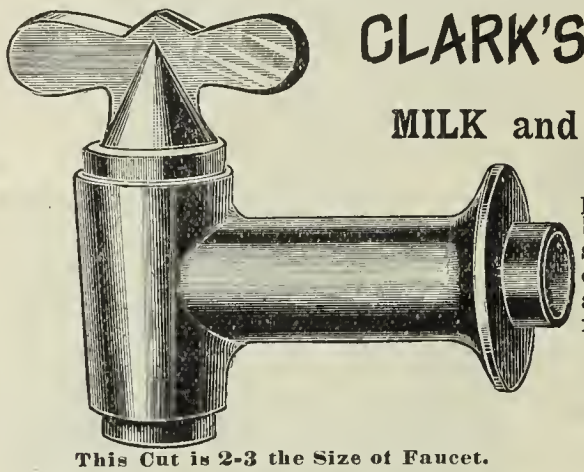
When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.



This Cut is 2-3 the Size of Faucet.

CLARK'S NEW FAUCET

—FOR—

MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.



GUM A RUBBER,

Or

RUBBER GUM,

Or

Elastic Cement.

No matter what you call it,

IT'S A DANDY.

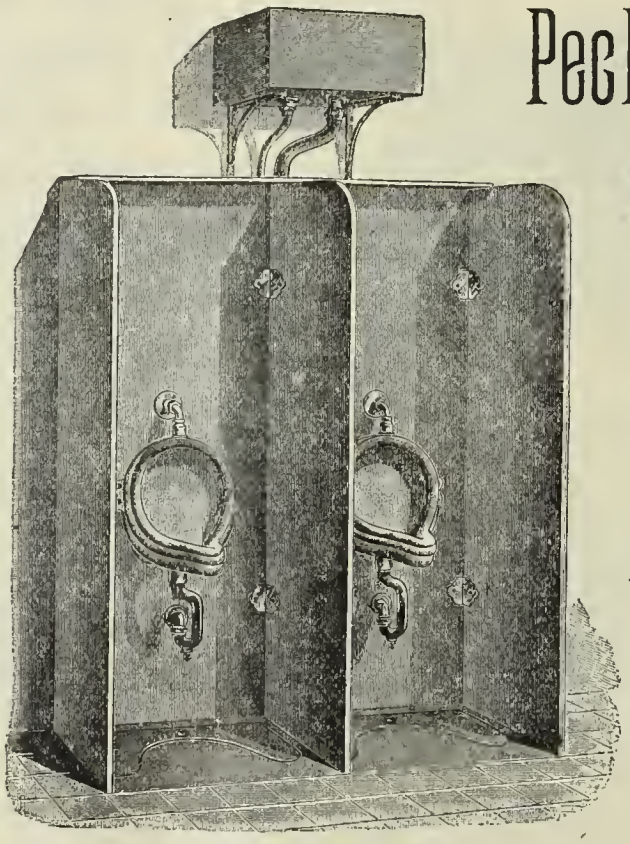
Just what you want to make a pipe joint tight. It discounts

WAX, RED LEAD, BLACK LEAD.

Holds the mercury sky high on a test joh.

BAILEY-FARRELL MFG. CO.,

PITTSBURGH.



Peck Bros. & Co.

AUTOMATIC URINAL.

Fig. 364

Catalogue of 1893.

WE MAKE

Fine Sanitary Work

OF ALL KINDS.

See our Catalogue.

Visit our Showrooms at

47 Cliff St., NEW YORK.

259 Wabash Ave. CHICAGO.

127 Chestnut St., NEW HAVEN, CT.

65 Oliver St., BOSTON.

Don't Buy

*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

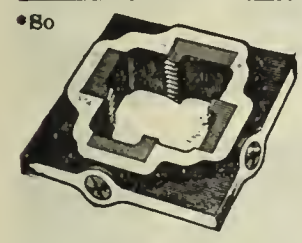
Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;

Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**

Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence of** quality.

If by chance you do not think these points, or the saving of money, objectionable,

*No 80



Send us a **Postal Note for 62 Cents** (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, PA., U. S. A.
SEND FOR CATALOGUE OF THE "SKELETON" PIPE DIE

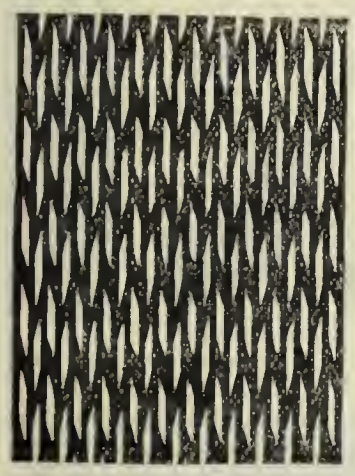
SIMS'S ADJUSTABLE EAVE TROUGH.



Pat. Jan. 14th, 1890.

Various Designs of Galvanized Sheet Steel Eave Troughs, Mitres, and Ridge Rolls, Roof Gutters, Expanding Conductors, Elbows, etc., etc.

THE SIMS MFG. CO., Sole Manufacturers, **NEWARK. OHIO.**



SHEET METAL LATH.

Improved METALLIC LATHING is now being used in construction of all modern buildings, being FIRE-PROOF, RIGID, with ample keying qualities, and is easily applied, and embraces a material saving in plaster if necessary.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted and Corrugated Leader, cheapest and best in the market. Sheet iron piping, Stove Pipe and Fittings of every description.

General Galvanizing to Order.

The Jersey City Galvanizing Co. Manufacturers and Jobbers in

Galvanized Material of Every Description.

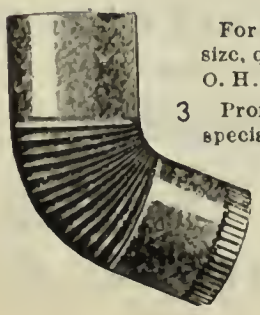
Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE OF OUR SPECIALTIES.

The "O.H." One Piece PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

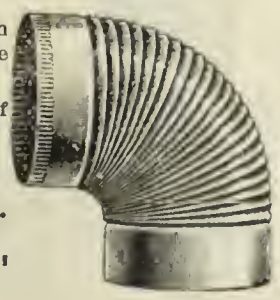
(PATENTED OCT. 25, 1892.)



For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is uncqualed.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

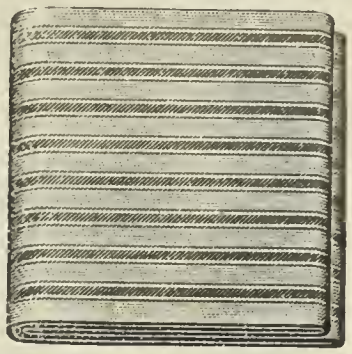
WRITE FOR PRICES.



For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.



"Columbia" Wiping Cloths

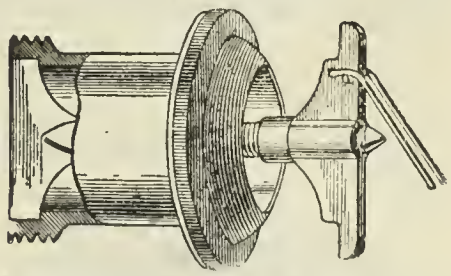
FREE!

Not free exactly from a financial standpoint (altho' very near it), but free from all defects due to a **Poor Quality of Ticking, Carelessness in Making and a Bungling Manner of Fastening the Ends.** A cloth free from the above defects is well worth the price we ask, 12 cents each, or six for 70 cents. Remember we make any kind—send us the size you want, giving the wiping edge first.

THE J. W. CHAMBERLAIN CO.,
Plumbing & Steam Fitting Specialties,
BANGOR, MAINE.

CLOSET REPAIR COUPLING.

(Patent applied for.)



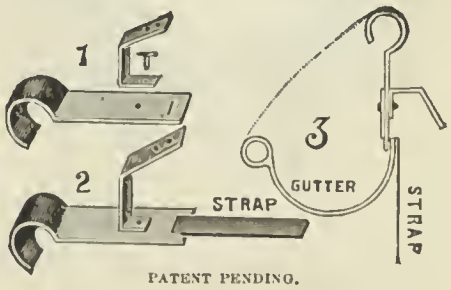
MADE in two styles, to suit iron and lead pipe.

TAKES the place of the old spud and necessitates no change in fixtures.

MANUFACTURED ONLY BY

SAVILL, WALLS & CO.,
Mfrs. of Plumbers' Supplies,
229 Budden Street - - - PHILADELPHIA.

STRAP E. T. HANGER.



PATENT PENDING.

TINNER, ATTENTION!

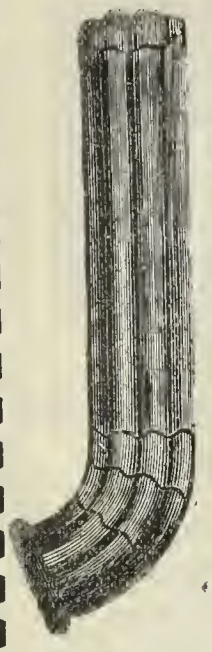
Save the narrow strips of Galvanized Iron and Tin that you have been taking to the Dump, for the **Strap Hanger.** Any wide awake TINNER can see at a glance the saving. Cut No. 1 shows Hanger as they are packed—Gross in a Box. **$2.50 per Gross,** freight allowed.

Discount to the Trade.

MANUFACTURED BY

JOHN SEVERDING, . Richmond, Ind.

POPULAR BECAUSE RELIABLE.



The "Austin" Corrugated

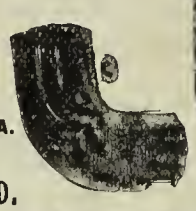
EXPANDING CONDUCTOR OR LEADER.



The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**





W. AUSTIN OBDYKE & CO.,

Manufacturers

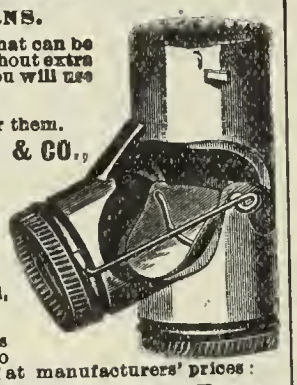
Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.

THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

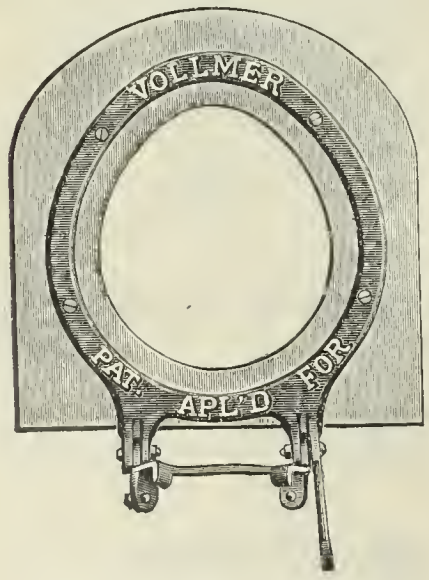
Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

3-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. CO., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. CO., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT McCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.

Vollmer Closet Seat.

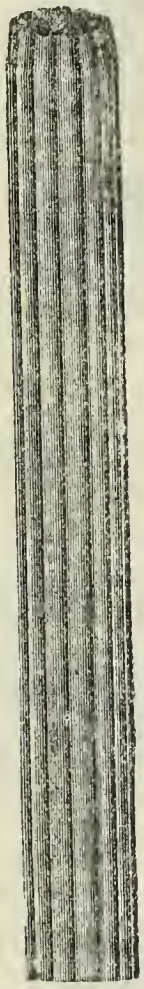


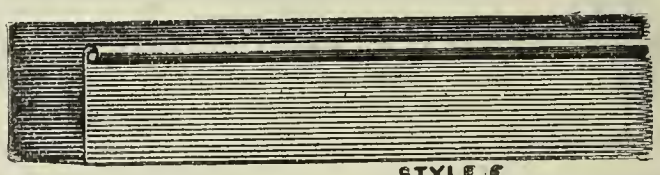
Can be attached to any Philadelphia Hopper by adjusting 2 set screws.

SEND FOR CATALOGUE.

ZERO VALVE CO.,

212 Seneca Street, - BUFFALO, N. Y.





STYLE 6.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

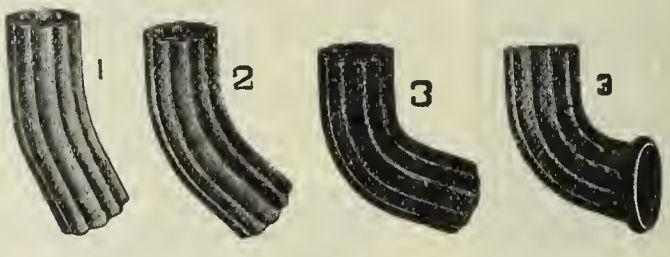
—MANUFACTURE—

PLECKER'S

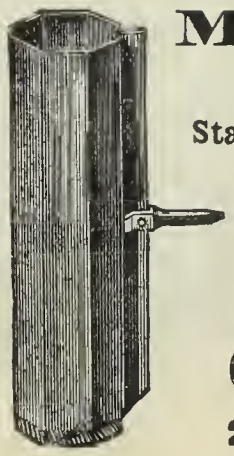
Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.







MARLIN & CO.,



(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.

BOWERS ROOFING AND METAL WORKS.



Standing Seam and Roll Roofing.

Painted Steel, Terne and Galvanized.

—MANUFACTURED BY—

L. M. BOWERS & CO., Binghamton, N. Y.



Corrugated Expanding Conductor

OF GALVANIZED IRON AND COLD ROLLED COPPER.



JAMES A. MILLER & BRO.,

129 and 131 South Clinton St.,

CHICAGO.





BERGER BROS.,

TINNERS' HARDWARE, ROOFERS' SUPPLIES,

231 AND 237 ARCH STREET, PHILADELPHIA.

GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,

LARGEST STOCK, GREATEST VARIETY, PROMPT SHIPMENTS.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Hods, Elbows, Ears, Handles, Valves and Plungers, etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.

If you want the best

Eave Trough,

Conductor Pipe, etc.,

Write us at once and get our prices. We can save you money, as well as furnish you with superior goods manufactured on new and greatly improved machinery—Address

The Kanneberg Roofing Co.,

Canton Ohio

SLATE

FOR ROOFING AND BLACKBOARDS.

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS.

AULD & CONGER,

100 EUCLID AVE., CLEVELAND, OHIO.

THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR.

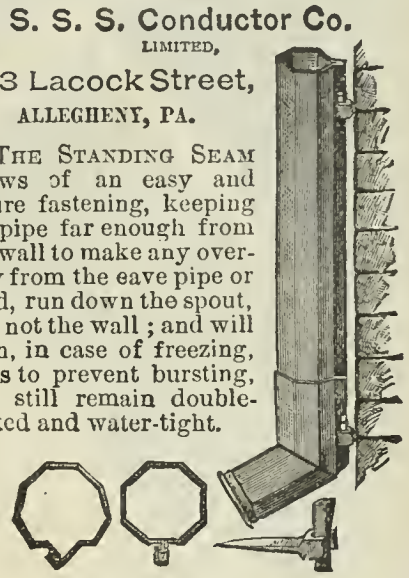
MANUFACTURED BY THE

S. S. S. Conductor Co.

LIMITED,

163 Lacock Street,

ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.

CLIMAX AUTOMATIC CELLAR DRAINER.

A Cheap, Reliable Remedy.

Never Failing.



It lifts water from Cellars, Wheel Pits, etc. and carries it into the street or sewer.

Requires no attention.

The Climax Gas Machine and Mixer stands at the head; makes brilliant, smokeless, steady and very cheap gas for stores, churches, etc.

WRITE FOR PAMPHLET.

C. M. KEMP MFG. CO.,

Baltimore, Md.

PATENTED

LONGEST LEAVE THROUGH IN THE WORLD 10FT WITHOUT A SEAM

PRESSED STEEL BRICK

COMPLETE GALVANIZED

STEEL FRONTS

ROCK FACE BRICK AND STONE

CONDUCTOR

CORRUGATED IRON

NO SIR! YOU CAN'T SELL ME YOUR ROOFING! I AM USEING BERGER'S PATENT, IT IS THE BEST IN THE MARKET, AND YOU KNOW IT."

BERGER'S PATENT ROOFING

CRIMPED IRON

PLAIN ROUND

FIRE PROOF DOORS & SHUTTERS

METALLIC SHINGLES

CONDUCTOR

EXPANDING

PATENT CEILINGS

25 STYLES

CORNICES AND FINIALS

PERFECTION WATER CUT-OFF

PERFECTION WIRE HANGER

IMPERIAL STEEL HANGER

SKYLIGHTS

ALL STYLES

132 PAGE Catalogue ON APPLICATION.

WRITE FOR PRICES IT WILL PAY YOU.

THE BERGER MFG. CO. CANTON, O.

IRON AWNINGS, ROOF PAINTS, WEATHER VANES, VENTILATORS, MALLEABLE IRON CRESTINGS, etc.

WESTERN AGENTS: ILLINOIS ROOFING & SUPPLY CO. CHICAGO, ILL.

Gummey's Anti Pin Hole Bright Tin Plate.

By permission of Messrs. Fieber & Holmes, Brookville, Indiana, we insert the following testimonial:

BROOKVILLE, IND., FEB. 1, 1895.

Messrs. GUMMEY, SPERING & Co.,
Philadelphia.

GENTLEMEN:

We have some Coffee Pots and Boilers made from your Anti Pin Hole Tin which have been in use over a year and only one of them ever came back for repairs. In this one case it had a flat copper bottom, and the *bottom* was worn out. We carefully examined the tin on the inside and could not see that it was eaten a particle.

This Boiler was a very large one for the County Poor Asylum.

Yours truly,

(Signed) FIEBER & HOLMES.

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. **BRIDGEPORT, OHIO.**

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD

Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,
535 to 547 West 15th Street, New York.

NEW CASTLE

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

New Castle Steel and Tin Plate Co., New Castle, Pa.

THE PHILLIPS TIN PLATE CO., Philadelphia, Pa.

"F. R. P. EXTRA." Treble coated. Oil Finish. Guaranteed to carry 45 lb. coating.
"PHILLIPS ROOFING." Extra heavy. Bright finish. " " 35 lb. "
"BOSTON." Heavy Spangled Terne. Guaranteed to carry 20 lb. coating.
"NATIONAL." (Worcester grade.) " " 10 lb. "

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

FOLLANSBEE BROTHERS COMPANY,

Successors to

James B. Scott & Co,

Manufacturers of the well and favorably known "**Scott's Extra Coated**" guaranteed Roofing Tin. **Trade-Mark Registered.**

The officers of this Company are the surviving members of the old firm, and the management, manufacture and inspection of each plate are in charge of the same individuals as heretofore.

Also sole factors

Blairsville Rolling Mill and Tin Plate Co.,

Manufacturers

Black Plate, Tin Plate, Terne Plate.

Offices and Warehouses, 122 and 124 Second Ave.,

PITTSBURGH, PA.

BEWARE OF IMITATIONS.

"BREVITY" MAY BE "THE SOUL OF WIT"—

But short pieces of tin do not make "TANDEM" CONTINUOUS ROOFING....

CUSTOMERS are told what to expect—and get it. In "TANDEM" they get a roll of good, prime tin, made of sheets 96 in. long, furnished either 14 in., 20 in. or 28 in. wide; and, if desired, THOROUGHLY WELL PAINTED.....

"TANDEM" is put on the market under no false pretenses. It is not a light weight tin; it is not made from 14 x 20 in. or 20 x 28 in. sheets—and IS NOT SOLDERED BY HAND.....

"TANDEM" Continuous Roofing Tin is made in IC and IX thicknesses. Primes and Wasters are sold separately. Before buying continuous roofing tin, be sure of what is being offered you in competition with "TANDEM".....

MERCHANT & CO., Inc.,

PHILADELPHIA, NEW YORK, CHICAGO, BROOKLYN, LONDON.

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

TRADE-MARK AMERICAN RGI CLEANED.

THE CAMBRIDGE IRON & STEEL CO.

MANUFACTURERS OF

GALVANIZED SHEET IRON

CAMBRIDGE C I&S CO BEST TRADE MARK

BLACK SHEETS FOR ROOFING & CORRUGATING

PICKLED & COLD ROLLED FOR STAMPING

CAPACITY, RANGES FROM No 30 26 INCHES WIDE TO 1×4×40×120

CORRESPONDENCE SOLICITED OFFICE & WORKS CAMBRIDGE, OHIO.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS.** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96 102 Reade St., New York.

The Unmarried Women of America.

It appears that in 1890 the number of women of all ages in the United States was 30,554,370, of whom 17,183,988, or 56.24 per cent, were single. The important fact for our present purpose is the number or percentage of marriageable women who are in fact not married. It is found that about 10 per cent. marry before the age of 20, and a very few before 15. The unmarried are made up of maids, widows and divorced persons, the last of which classes is so small that it need scarcely be considered for the present purpose. Omitting the actual numbers and using percentages only, the returns show that between the ages of 20 and 25 about 53 per cent. were without husbands; between 25 and 30, about 28 per cent.; between 30 and 45, about 20 per cent. After this the number of widows increases so rapidly that from 45 to 55 the unmarried amount to 26 per cent., and of women over 65 years of age only a little over 35 per cent. have husbands. Nearly 6 per cent. of all women never marry; about 10 per cent. of those between the ages of 35 and 45 had not yet married, and more than one-fourth of those between the ages of 25 and 30 were still unmarried.—*Brooklyn Eagle.*

— THE MINOR TORTURES OF LIFE.— Lord Aberdeen tells the following story on himself: He left London at midnight in a sleeping car for the North. In the morning when he was awakened he saw a stranger opposite him.

"Excuse me," said the stranger, "may I ask if you are rich?"

Somewhat surprised, his Lordship replied that he was tolerably well to-do.

"May I ask," continued the stranger, "how rich you are?"

"Well, if it will do you any good to know," was the reply, "I suppose I have several hundred thousand pounds."

"Well," went on the stranger, "if I were as rich as you and snored as loud as you, I'd take a whole car so as not to wake up other people."—*Exchange.*

ROOFING PLATES, all Grades.

BRIGHT PLATES, Charcoal and Coke.

American and Foreign.

A Large Assortment of Qualities, Weights and Sizes.

SHEET IRON.

B B GALVANIZED,

CHARCOAL CLEANED,

COLD ROLLED,

COMMON.

Galvanized and Terne Eave Trough and Gutter.

Corrugated Leader, Elbows and Shoes.

SOLDER—A Specialty, our own make.

Tin, Pig and Bar, Sheet Zinc,
Lead, Pig and Bar, Sheet Copper,
Ingot Copper, Iron Lathing,
Antimony, Wire,
Hard Metal, Rivets.

Also a large assortment of TINNERS' TOOLS and MACHINES, and a full line of other goods for Spring trade.

BRUCE & COOK,

186, 188, 190 Water St., 248, 250 Pearl St., New York.

Orders and inquiries solicited.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack, Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. Brooklyn, N. Y.

THE PHILADELPHIA STEEL ROOFING CO.
MANUFACTURERS OF
STEEL ROOFING AND CORRUGATED IRON,
514, 516 & 518, BEACH ST.
PHILADELPHIA PA.
SEND FOR CATALOGUE AND PRICES.

E. J. JOHNSON & Co.,
MINERS AND SHIPPERS OF
ROOFING : SLATE.
OFFICE, 38 PARK ROW,
SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC.
QUARRIES, BANGOR, PA.
NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.
JOHN GALT & SONS.
MINERS AND WHOLESALE DEALERS IN
All KINDS of ROOFING SLATE.
253 BROADWAY, ROOMS 805 and 806, NEW YORK.
Prices given delivered at any R. R. Station in the United States.

SLATE
Kitchen Sinks,
Laundry Tubs,
Washstand Tops,
Marbleized Shelves,
Materials of all kinds,
Fairhaven Marble & Marbleized Slate Co.,
In all Forms, also Mantels.
FAIRHAVEN, VERMONT.
SEND FOR CATALOGUE.

BANGOR EXCELSIOR SLATE COMPANY,
R. S. BROWN, Proprietor.
Miners and Manufacturers of
GENUINE BANGOR SLATE
Quarries at Bangor, Pa.
MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, EASTON, PA

RISING & NELSON,
WEST PAWLET, VT.
MANUFACTURERS OF
RED and GREEN ROOFING SLATE.
Wholesale Dealers in all kinds of Roofing Slate.
CORRESPONDENCE SOLICITED.

Light
AND
Medium Weight
GRAY IRON
CASTINGS.

WE SOLICIT CORRESPONDENCE WITH THOSE WHO USE THE ABOVE.

We claim to have few equals and no superiors in quality.

We have unusual capacity.
Two seven-foot cupolas.

The Taylor & Boggis Fdy. Co.
523 Seneca St., Cleveland, O.

PALM OIL
BRANDS:
"Cecelia" Clarified Palm,
"Lagos" Palm,
"Choice Red" Palm,
"Brown" Palm.
"Cecelia" Clarified Palm Oil is prepared by us especialy for Tin Plate Manufacturers, and is clarified in order to remove moisture grit, and free acid to the minimum, thus making it the safest and surest oil to use.
LAMBERT, STOUGHTON & COOPER,
IMPORTERS AND PRESSERS OF OIL,
117 Walnut St., PHILADELPHIA, PA.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.

AMERICAN ROOFING CO.,

ST. LOUIS and CINCINNATI.

Mention this paper.



JAMES A. MILLER & BRO.,

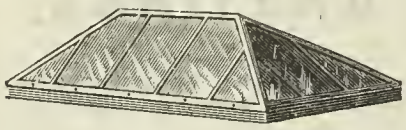
129 and 131 S. Clinton St., Chicago,

MANUFACTURERS

Galvanized Iron Cornices and Window Caps.



SHEET METAL SKYLIGHTS

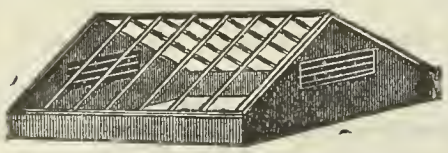


Owing to increased facilities (secured to enable us to fill our World's Fair contracts), we can make specially low prices on Skylights.

CORRUGATED { *Iron Roofing.* / *Conductor Pipes.*

See other Advertisement in this Paper.

RASNER & DINGER



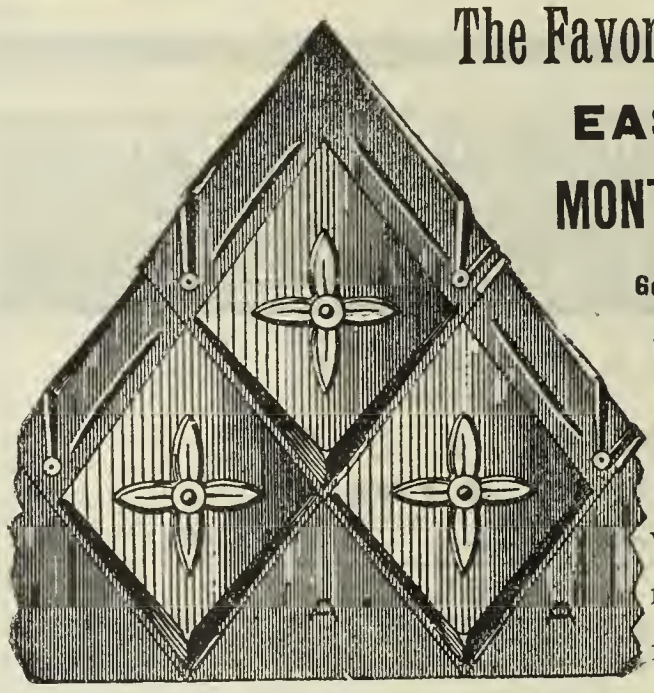
Manufacturers of HAYES' PATENT

Metallic Sky-Lights,

Galvanized Iron Cornices and all kinds of Architectural Sheet Metal Work, Tin and Iron Roofers.

Second Ave. & Ferry St., Pittsburgh, Pa.

JOHN SANBORN,
Dealer in Metals,
and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 WATER STREET,
Near Beekman Street, NEW YORK.



The Favorite Metal Shingle

EASTLAKE.

MONTROSS PATENT.

Gothic and Diamond Tile.

Unequaled for beauty and excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit Mich.
MONTROSS METAL SHINGLE CO., Camden, N. J.
E. VAN NOORDEN & CO., Boston, Mass.

HOLTON ROOFING SIDING. IRON ROOFING CEILING &C. NEW LISBON, O.

AGENTS WANTED EVERYWHERE

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

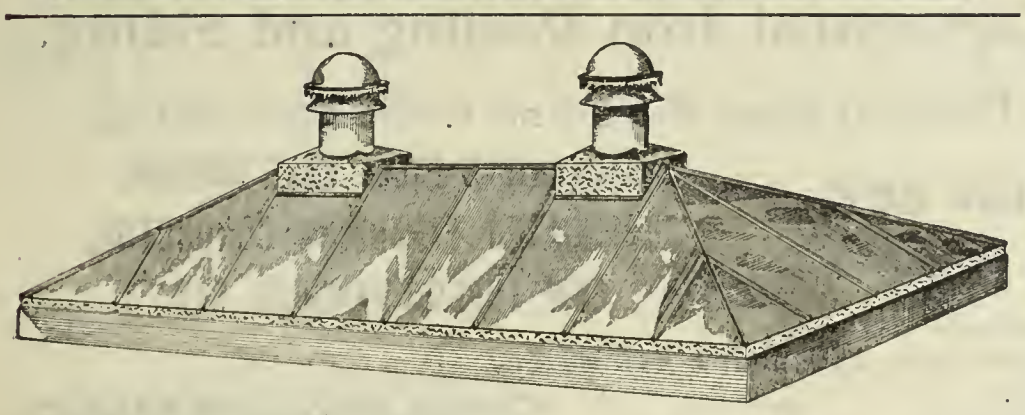
Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.





Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.



WORLD'S FAIR AWARD

We are the only Steel Roofing Co. awarded Medal and Diploma for PATENT CAP ROOFING at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

MANUFACTURERS

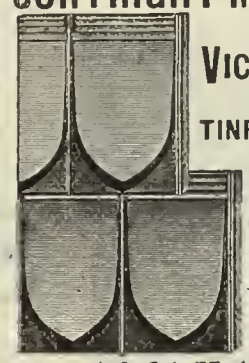


FOR

ROOFING AND SIDING.

Send for Circular and Prices.

CORTRIGHT METAL SLATES



and

VICTORIA SHINGLES

Made of

TINPLATE, (Full Weight Only)

Galvanized Steel

and

COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila

Western Office, 134 Van Buren Street, Chicago.

Defy Fire and Time

WITH OUR

Steel Roofing,

Steel Ceilings, (Patented)

Corrugated Iron, Conductor Pipes,

Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,

Office and Works, Wheeling, W. Va.

Office and Warehouse, 474 Laflin St., Chicago.

Office and Warehouse, 81 Fulton St., New York.

DUGAN'S PATENT SNOW GUARDS FOR SLATE AND OTHER SLANTING ROOFS

SEND FOR ILLUSTRATED CIRCULAR & PRICE LIST.

M. HALLIDAY,

SOLE PROPRIETOR AND MANUFACTURER.

218 EAST NINTH STREET, NEW YORK.

IRON ROOF CRESTING.

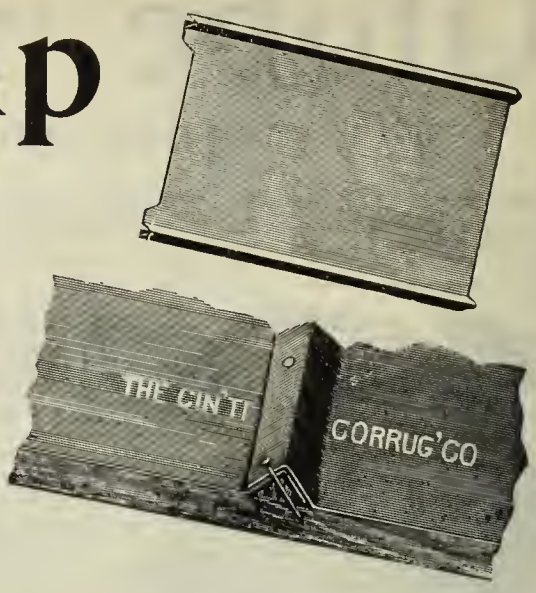
Full line of new and desirable designs.

S. GREEN & SONS, Des Moines, Ia.

Our little book
"The Life of an Iron Roof,
or How Long Will It Last?"
sent free.

Crimp

The many years this style of Roofing has been before the public amply attests its merit.



It's the best
"STAY ON"
Roofing ever made.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.

The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S.

FIRST & WASHINGTON STS. JERSEY CITY, N.J.



Fine Metal Ceilings.

J. H. ELLER & CO.,

MANUFACTURERS OF

STEEL ROOFING,

Corrugated Iron Roofing and Siding,

Pressed Steel Brick and Rock Face Siding.

GALVANIZED CORNICE, WINDOW CAPS, CRESTINGS, FINIALS, ETC.

GALVANIZED STEEL EAVE TROUGH, CORRUGATED EXPANDING CONDUCTOR, EAVE TROUGH HANGERS, ETC.

Estimates Furnished for Special Designs on Short Notice

WRITE FOR CATALOGUE AND PRICES.

Office 194 E. Fifth Street, - - - - - - **Canton, Ohio.**



59 N. 2d STREET, - PHILADELPHIA, PA.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade.

TIN AND IRON SHOW CARDS.

110 John St., - New York.

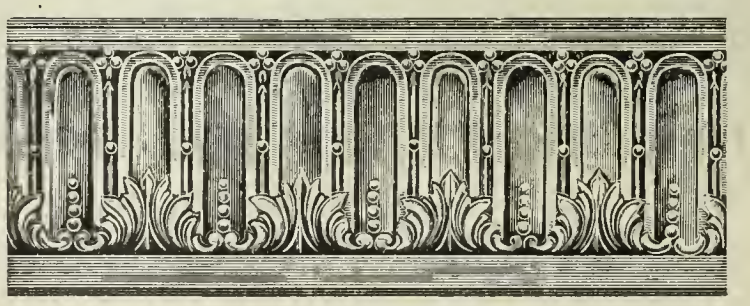
— A MEAN TRICK.—First Street Fakir: "It's a shame to swindle a poor, hard workin' man that way."

Second Ditto: "What's the trouble?"

"Here I worked hard for half a day paintin' up a sparrer into a red-headed Belgian canary, and I'm blowed if the feller I sold it to didn't give me a counterfeit dollar for it."—*Tit Bits.*

Friedley & Voshardt,

194 and 196 Mather St., Chicago, Ill.,



MANUFACTURERS OF

Sheet Metal, Zinc and Copper Ornaments

For Interior and Exterior Work, Steel Ceilings, Statuary, &c.

Send for Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.

Architectural
Sheet Metal
Work.

Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.

STEEL

RHODES, DICKELMAN & CO.,
FOREST, O.

FINIALS,
ELBOWS,
HANGERS,
CRESTINGS,
EAVE TROUGH,
CONDUCTOR PIPE,
EVERYTHING.

ROOFING

The easiest laid, the most durable, the cheapest and best made. Get our prices and samples.

WILLIAM CONNORS,

MANUFACTURER OF

American Seal Paints and Cements



For Houses, Floors, Roofs, Fences, Cars and Bridges. Carriage Gloss Paint.



For Slate, Tile and Metal Roofs Stoves, Ranges and Furnaces. Paste Stove Polish. Mortar Stains.

Office & Factory 677-679 River St., **Troy, N. Y.**

WHITE LEAD AND ZINC PAINTS, COLORS, PUTTIES, &c.

SAMPLES AND PRICES FREE ON APPLICATION.

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

——MANUFACTURERS OF——

SHEET METAL ROOFING, SIDING AND CEILING

——OF ALL DESCRIPTIONS FROM——

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.
Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.
Factory 113 to 133 Soulard Street, ST. LOUIS, MO.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York.

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds.

ELBOW CHART

—FOR—

TIN and SHEET IRON WORKERS,

Giving the Rise of the Miter Line of Elbows of any Diameter and Number of Pieces and for any Angle.

This is one of the best and most practical systems for producing elbow patterns, for the use of all light or heavy sheet metal workers. It is simple, accurate and most valuable, being the only *thumb* rule ever produced from which accurate results may be expected. Every good workman has some rule by which he may develop a satisfactory pattern for Elbows at right angles, but when something different is wanted, it is a little trouble. By the use of this chart he can safely depend on getting a correct pattern for any elbow no matter of what diameter, number of pieces, or angle, and mark it out direct on his strip of iron or tin, almost as quick as if he had a pattern. This chart has more combinations and measurements than may be counted, and will be a great help to young or old at the business.

PRICE, 50c. BY MAIL.

DAVID WILLIAMS.

PUBLISHER and BOOKSELLER,

96-102 Reade Street, - New York.

New Road Material.

At Hornsey, a London suburb, the dust of the district is collected and burnt, leaving considerable residue in the shape of clinker, and the coarser of this is found to make excellent material for road making and will easily sell at two shillings per load. The finer clinker is put in a mortar mill and, mixed with lime or cement, is used as mortar and grouting, but there is still a great deal left, and this, it is stated, mixed with a fair quantity of Portland cement, makes excellent paving stones at about half the cost of those purchased from the various patent stone makers. A section of Southwood lane, Highgate, at the entrance to the railway station, has been laid with this paving. It is said to be very hard and to wear exceedingly well.

— A CONTRIBUTION ENTERTAINMENT.—An amusing incident of a recent service in a London church is given by the *Telegraph*. The young man who carried around the plate put a shilling into it, as he supposed, before starting. The congregation included many young and pretty girls, who, as they looked on the plate, all seemed astonished and amused. The young man then for the first time cast a glance at it himself and found that what he had taken from his pocket was a conversation lozenge, with the words: "Will you marry me?" in red letters staring everybody in the face; while one of the girls had capped it by a second lozenge on which was printed: "Name the day."—*Exchange.*

— FARMER: "I bought some stock in that Western land company."

Broker: "Wasn't it watered?"

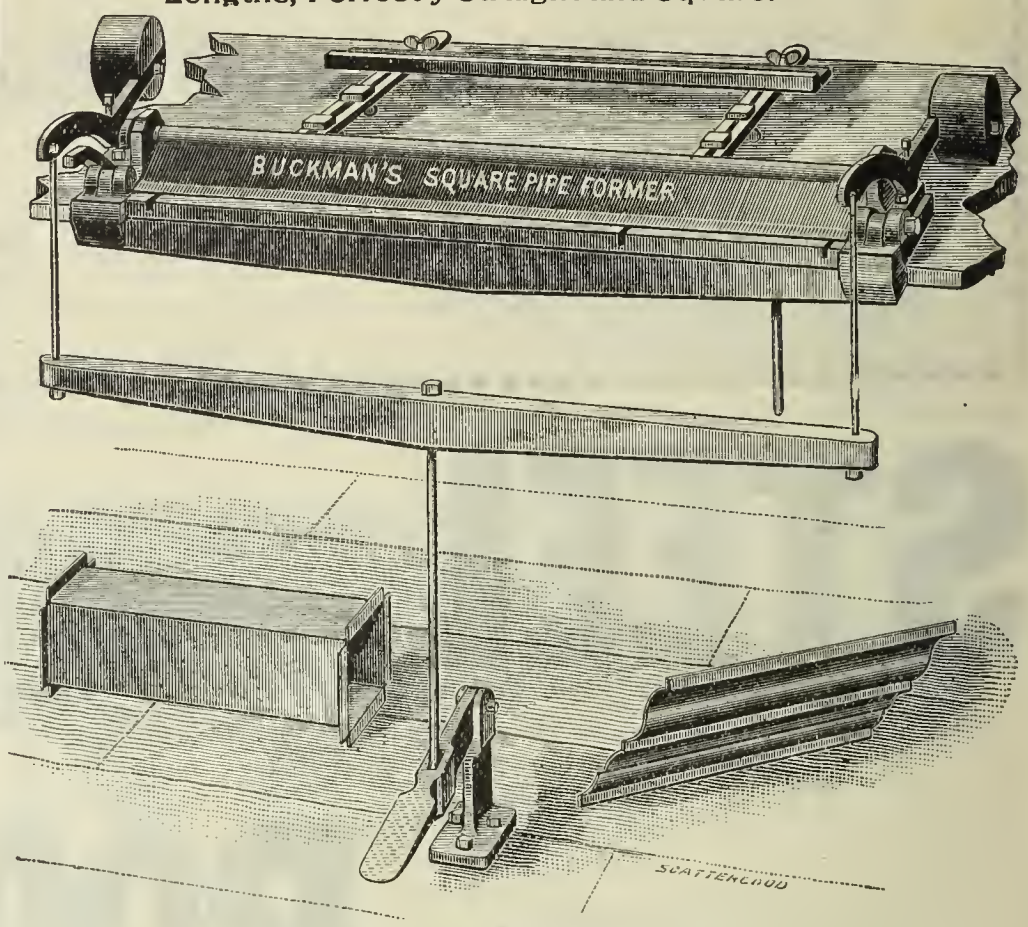
Farmer: "That's what I understood, but they've been assessing me like the mischief for irrigation purposes."—*Detroit Free Press.*

BUCKMAN'S

—IMPROVED—

SQUARE PIPE FORMER AND CORNICE BRAKE

Will form Square Pipe, Two Inches and Larger, in Thirty Inch Lengths, Perfectly Straight and Square.



Pat'd 5-28-89.

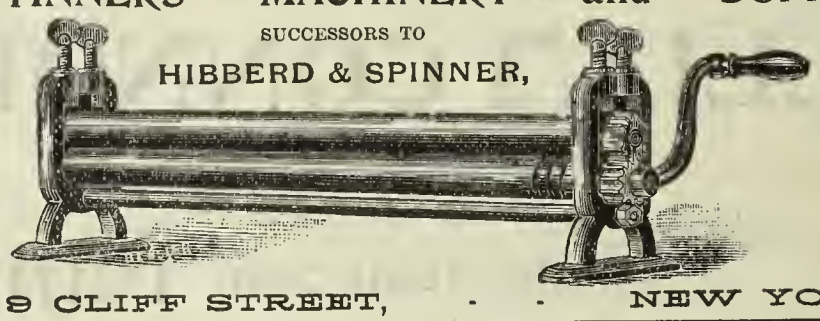
WRITE FOR PRICES.

P. B. CALVERT & CO., PHILADELPHIA.

TINNERS' - MACHINERY - and - SUPPLY - CO.,

SUCCESSORS TO

HIBBERD & SPINNER,



Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery, Presses, Dies and Can Makers' Tools.

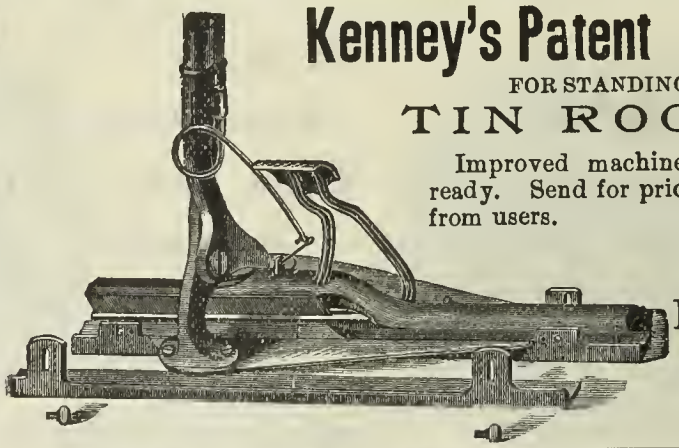
FULL LINE OF SUPPLIES.

9 CLIFF STREET, - - NEW YORK CITY

Kenney's Patent Double Seamer

FOR STANDING LOCK

TIN ROOFING.



Improved machine, from new patterns, now ready. Send for prices and flattering testimonials from users.

MANUFACTURED BY

Dwight Slate Machine Co.,

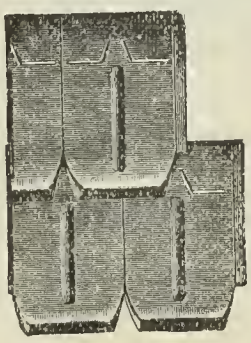
Hartford, Conn.

THORN'S PATENT METALLIC ROOFING

TILES AND SPRING-LOCK SHINGLES.

THE BEST, MOST HANDSOME, DURABLE AND SECURE ROOFING PLATES YET OFFERED TO THE BUILDING TRADE.

Indorsed by All the Leading Architects.

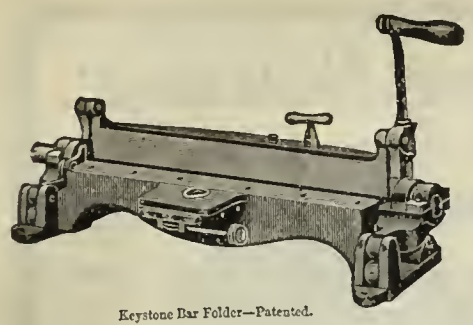


Our system differs from all others in existence. We keep a complete stock of *eight designs of tile and two sizes of shingles.* Our tiles are a marvel of beauty and have the most secure and most practical side-lock ever invented.

Send for illustrated catalogue and circular.

THORN SHINGLE & ORNAMENT CO.,

1221 Callowhill St., Philadelphia, Pa.



Keystone Bar Folder—Patented.

NIAGARA

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

A FULL LINE.

The Best and Most Improved

ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

CORNICE MAKERS' TOOLS.

PRESSES AND DIES.

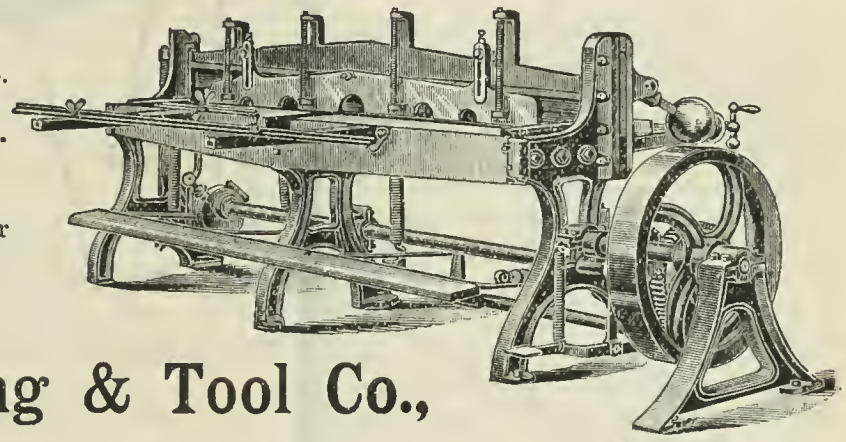
Squaring, Slitting and Circle Shears.

Complete Outfits for making Tinware, Cans and other Sheet Metal Goods.

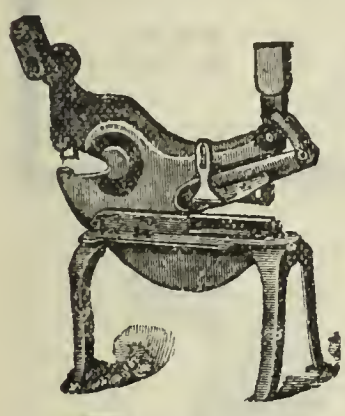
——MANUFACTURED BY——

The Niagara Stamping & Tool Co.,

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**



10-foot Cornice Maker's Shear for foot and power.

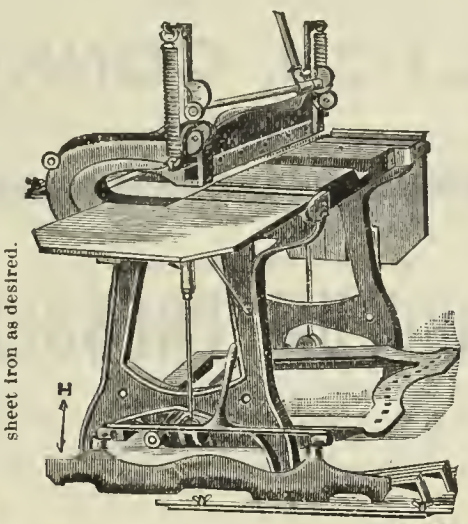


Improved Pat. Combined Punch

and Stock Shears. (7) different sizes, from 200 to 1000 lbs., for light or heavy work; 6 to 15 in. throat punch. A general purpose tool adapted for punching and cutting bar and sheet iron as desired.

Crimping or Corrugating Rolls.

Are made in different sizes with fine or coarse corrugations, also designed for curving if desired



New General Purpose Gap Shears,

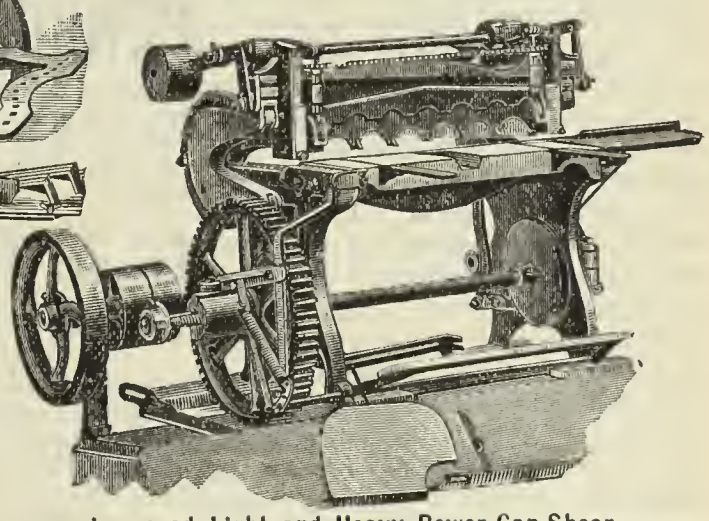
12, 15 or 18 in. throat, for slitting wide sheets as desired and regardless of length. Are made in suitable sizes for light or heavy work. With the Patent Lever Attachment can cut up to No. 16 and 14 gauge. Three different style Squaring and Slitting Shears, also Plain Square Shears all sizes up to 10½ feet long.

BEWARE OF INFRINGEMENTS.

THESE TOOLS ARE MADE BY

BERTSCH & CO.,

Cambridge City, Ind.



Improved Light and Heavy Power Gap Shear.

12 to 21 inch throat, for slitting wide sheets. (4) different styles and (8 different lengths up to 10½ feet long to cut No. 8 and lighter. Special design to cut 3-16 inch to ¼ inch plates. Are provided with Automatic Hold-down, Automatic Clutch and Patent Drop-leaf Tables with Trimming Gauge.

ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

LEAD WASHERS

No. 8, Large Hole.



Full Size. CONCAVE.

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole



Full Size. CONCAVE

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. **LITTLEFORD BROS.,** SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O.

THE ROOT & BARRON

ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer,
PALMYRA, NEW YORK.

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

First, for Rapidity of Work.
Second, for Quality of Work.
Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

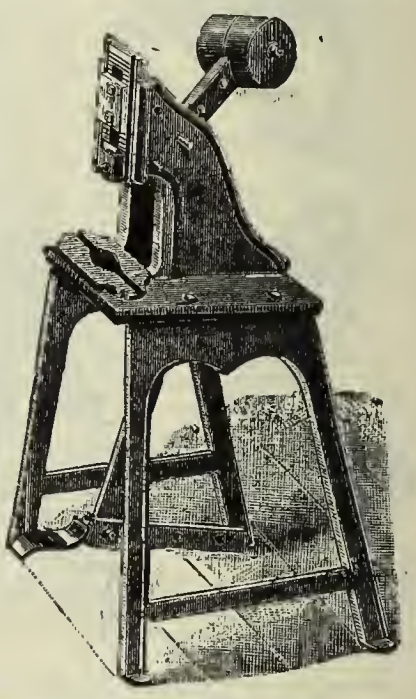
LYON, CONKLIN & CO.,

Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.

—OUR—

PENDULUM PRESSES



are suitable for a wide range of work. Grooved beds with sliding bolts for holding all sizes of dies. Perfectly fitted balanced, and adjustable to light and heavy blows. A first-class machine in every respect.

MANUFACTURED BY

G. A. Crosby & Co.,

176 & 178 So. Clinton St., CHICAGO, ILL., U. S. A.,

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap Makers', and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Brass Goods and all Hardware Novelties.**

Special Attention to Dies of every Description.

WORK GUARANTEED THE BEST.

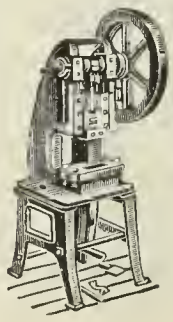
Write for Prices and New Catalogue containing full line of Tinners' Tools.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.

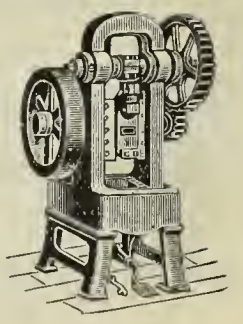
THE TOLEDO MACHINE & TOOL CO.,

MANUFACTURERS OF

Power Punching Presses, Drop Presses, Trimming Presses, Stamping Presses Riveting Presses, Embossing Presses, Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.



Send for Catalogue now being printed.



The Toledo Mach. and Tool Co.

Superior and Oak Sts.. Toledo, O.

ALPHABETICAL LIST OF ADVERTISERS.

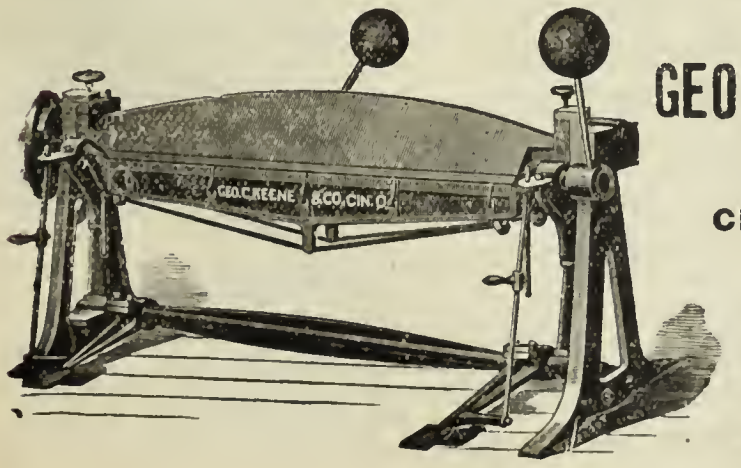
Acme Roofing & Supply Co.. 84
Ætna Standard Iron & Steel Co..... 79
Aluminum Heater Co..... 26
American Boiler Co..... 15
American Radiator Co..... 1
American Roofing Co..... 84
American Sheet Iron Co..... 81
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 74
Auld & Conger..... 77
Bailey-Farrell Mfg. Co..... 74
Bangor Excelsior Slate Co.. 83
Barstow Stove Co..... 96
Bascom, H. Clay.. 71
Belden, F. E. Mica Mining Co..... 27
Bellaire Stamping Co..... 64
Berger Bros..... 77
Berger, L. D.....74&86
Berger Mfg. Co..... 78
Bertsch & Co..... 89
Bibb, B. C. Stove Co..... 17
Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 27
Bowen Mfg. Co..... 29
Bower, B. P. & Co..... 74
Bowers Roofing & Metal Wks 77
Brauer, A. G..... 71
Bridgeport Crucible Co..... 70
Brombacher's Sons, Jacob.. 95
Brnce & Cook.....60, 82&96
Buffalo Register Works..... 29
Burgess Soldering Furnace Co..... 62
Burton, W. J. & Co..... 84
Calely, Ed. L..... 70
Calvert, P. B. & Co..... 88
Cambridge Iron & Steel Co.. 81
Canfield, H. C..... 73
Canton Steel Roofing Co..... 87
Carton Furnace Co..... 3
Central Cligas Stove Co..... 7
Central Stamping Co..... 65
Challenge Corn Planter Co.. 28
Chamberlain, J. W. Co..... 75
Cheney, S. & Son..... 73
Chicago & Erie Stove Co..14&16
Cincinnati Corrugating Co.. 86
Clark, G. M. & Co..... 8
Clark Novelty Co..... 74
Clark, Quien & Morse..... 76
Clayton & Lambert Mfg. Co. 72
Cleveland Gas Machine Co.. 64
Clough, R. M 91
Columbia Refrigerator Co.. 25
Colwell Lead Co..... 73
Connecticut Plating Co..... 70
Connors, Wm..... 87
Cooney, Seiner & Co..... 78
Cope, Geo. W..... 71
Corning Mfg. Co. 17
Correspondence School of Mechanics..... 60
Cortright Metal Roofing Co. 85
Cory, U. & Co... 19
Couch Bros. Mfg. Co..... 73
Covert Mfg. Co..... 64
Craig-Reynolds Fdy. Co..... 16
Crosby, G. A. & Co..... 90
Curtis & Curtis..... 74
Dalton-Ingersoll Co..... 72
Dangler Stove & Mfg. Co.... 10
Day Mfg. Co..... 73
Dayton Mfg. Co..... 11
De Haven & Co..... 12
Dixon, Jos., Crucible Co..... 62
Douglas, W. & B..... 74
Dover Machine Works..... 91
Dwight Slate Machine Co.... 88
Electric Boiler Co..... 17
Eller, J. H. & Co..... 86
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 83
Ferrosteel Co..... 29
Follansbee Bros. Co..... 80
Foskett & Bishop Co.. 61
Fostoria Steel Roofing Co... 85
Fox, Chas. F..... 59
Frink, I. P..... 96
Friedley & Voshardt..... 86
Froelich, A., Estate of..... 70
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 83
Garry Iron & Steel Roofing Co 85
Gender & Paeschke Mfg. Co. 67
Giblin & Co..... 19
Glenmore Foundry & Machine Co..... 22
Globe Iron Roofing & Corrugating Co 85
Globe Ventilator Co..... 71
Gobeille Pattern Co..... 71
Gobeille, Wm..... 71
Gordon, W. J..... 94
Gorton & Lidgerwood Co..... 1
Graff & Co..... 16
Greene, W. F 59
Green, S. & Sons..... 85
Grinberg Bros..... 26
Griswold Mfg. Co... 85
Gummey, Spering & Co..... 79
Gurney Heater Mfg. Co..... 19
Gurney Refrigerator Co..... 28
Halliday, M. 85
Hamilton, John..... 96
Hart & Crouse..... 22
Hartford Hollow Ware Co.. 64
Haslet, Flanagen & Co..... 64
Hess, Snyder & Co..... 26
Highland Foundry Co..... 1
Highton, Wm. & Sons..... 29
Holton Iron Roofing Co..... 84
Howard Furnace Co..... 30
Howard Thermostat Co..... 19
Howson & Howson..... 61
Illinois Zinc Co..... 81
Indiana Ladder Co..... 66
Illinois Refrigerator Co..... 28
Iwan Bros..... 69
Jackson's Sons, W..... 19
Jenkins Bros..... 1
Jersey City Galvanizing Co. 75
Johnson, E. J. & Co 83
Jones, L. B..... 25
Kanneberg Roofing Co..... 77
Kansas City Metal Roofing & Corrugating Co..... 89
Keene, Geo. C. & Co..... 91
Kelly, Thos. & Bro..... 72
Kemp, C. M Mfg. Co..... 77
Kendrick Valve & Washer Co..... 61
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 61
Kewanee Boiler Co..... 18
Kieckhefer Bros. & Co..... 65
Kieley, T..... 1
Kilbourne & Jacobs Mfg. Co. 72
Lambert, Stoughton & Cooper 83
Lawrence-Letts Elbow Co... 75
Lindemann, A. J. & Hoverson Co..... 25
Littleford Bros..... 89
Lufkin Rule Co..... 94
Lyon, Conklin & Co.... 90
McClure & Co..... 96
McDaniel & Harvey Co..... 82
McLanghlin, J. K. 71
McLeod & Henry Co.. 70
Mahony, M..... 18
Marcy Stove Repair Co..... 70
Marlin & Co..... 76
Marston, I. G. & Co..... 64
Mason & Davis Co..... 12
Mason Regulator Co..... 1
May & Fiebeger 23
Merchant & Co., Inc..... 81
Merry, Geo. E..... 79
Menrer Bros. Co..... 83
Mica Mfg. Co..... 29
Michigan Stove Co..... 13
Michigan Vapor Stove Co... 11
Millar, Chas. & Son... ... 96
Miller, Jas. A. & Bro.....77,84&85
Miner & Peck Mfg. Co... ... 94
Montross Metal Shingle Co.. 84
Mowry, W. C..... 27
Mullins, W. H..... 85
Munsell, E. & Co... 27
Myers, F. E. & Bro..... 74
National Wringer Co..... 67
Newark Regulator Co..... 73
New Castle Steel & Tin Plate Co..... 79
New York Central Iron Wks. 17
New York Elbow Co..... 64
New York Iron Roofing & Corrugating Co..... 86
New York Nickel Plating & Mfg. Co..... 69
Niagara Stamping & Tool Co. 89
Niles Mfg. Co..... 67
Obdyke, W. A. & Co..... 76
Obermayer, S. Co..... 70
Ohl, Geo. A. & Co 94
Osborn, J. M. & L. A..... 62
Ostrander, W. R. & Co..... 62
Page Boiler Co., Wm. H..... 27
Palermo Mica Co..... 27
Pancoast, Henry B. & Co.... 75
Paxson, J. W. & Co..... 70
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 74
Peninsular Stove Co.....20&21
Phelps, Dodge & Co..... 80
Philadelphia Steel Roofing Co..... 83
Phillips Tin Plate Works.... 79
Pocock, C..... 62
Pontyminster Old Style Ternes..... 81
Poorman Mfg. Co..... 95
Portsmouth Stove & Range Co..... 14
Presbrey Stove Lining Co... 71
Putnam Foundry & Machine Co 22
Rasner & Dinger 84
Republic Iron Works, ... 84
Rhodes, Dickelman & Co.... 87
Ringen Stove Co..... 2
Rising & Nelson..... 83
Robinson, J. M. & Co..... 95
Rochester Stamping Wks.... 66
Rome Mfg. Co..... 69
Root, A. L..... 89
Rutland Fire Clay Co.... 71
St. Louis Corrugating Co.... 87
St. Louis Stamping Co..... 69
S S. S. Condnctor Co..... 77
Salem Nail Co.. 87
Sanborn, John..... 84
Saunders' D. Sons..... 73
Savill, Walls & Co..... 75
Sayre Stamping Co..... 59
Schaffer, J. P..... 18
Schneider & Trenkamp Co.. 9
Severding, John..... 75
Shepard, Sidney & Co..... 66
Sheppard, Isaac A. & Co..... 1
Silver & Co 69
Sims Mfg. Co. 75
Smith & Winchester Co..... 22
Smith Co., H. B... 18
Smith, J. D. Fonndry Supply Co 71
Souther, E. E. Iron Co..... 81
Special Notices..... 60
Sperry, D. R. & Co..... 69
Standard Lighting Co..... 6
Star Coupler Co..... 15
Star Mfg. Co..... 64
Stebbins, E. Mfg. Co..... 73
Steel Clad Bath Co..... 73
Stellwagen & Kynoch..... 59
Stiles & Parker Press Co.... 86
Stocking, S. B..... 61
Sykes Iron & Steel Roofing Co 85
Taplin, Rice & Co..... 14
Tarbox Mfg. Co..... 70
Tatum, S. C. Co..... 68
Taylor Co.. N. & 96
Taylor & Boggis Foundry Co. 83
Thatcher Furnace Co..... 15
Thorn Shingle & Ornament Co..... 88
Tinners' Machinery & Supply Co. 88
Tinplate Decorating Co..... 86
Toledo Machine & Tool Co.. 80
Trethaway Bros.... 66
Troy Nickel Works..... 27
Troy Oil Stove Co..... 26
Tuttle & Bailey Mfg. Co..... 29
Union Heater & Supply Co.. 73
United States Heater Co.... 18
Utter, Sam S..... 24
Valentine, M. D. & Bro. Co... 71
Van Namee, G. L. Mfg. Co.... 59
Van Noorden, E. & Co.. ... 84
Van Range Co., John..... 4
Vedder Pattern Works..... 71
Vogel, William & Bros..... 67
Washburne, E. G. & Co..... 71
Wayne, Jos. W..... 27
Weathered's, Thos. W. Sons 11
Wheeling Corrugating Co... 85
White Mountain Freezer Co. 63
Whitlock, W..... 73
Wise, John & Son..... 64
Wilson, R. M..... 62
Wister, L. & R. & Co..... 96
Wohler Aluminum Co..... 66
Wood, Alan Co..... 82
Wood Co., W. Dewees..... 96
Yates & Co..... 60
Zero Valve Co..... 76

THE KEENE FOOT POWER

CORNICE BRAKE.

EASIEST TO OPERATE, STRONGEST AND BEST.

Sheet Metal Working Machinery of all Kinds.



GEO. C. KEENE & CO.,

Cincinnati, O.

AGENTS:

Hibberd & Spinner, 9 Cliff St., New York

Holder & Herrick, 49 Broad St., Boston, Mass.

Ledwidge & Co., 234 Lake St., Chicago, Ill.

PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

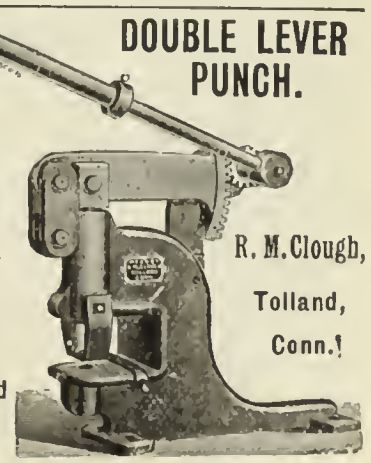
Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS, Dover, Del.

DOUBLE LEVER PUNCH.

Capacity, ½ in. hole in ¼ in. Iron.



Send for Circular and Price.

R. M. Clough, Tolland, Conn.

CLASSIFIED LIST OF ADVERTISERS.

Aluminum.
Shepard, Sidney & Co., Buffalo, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield, H. O., Bridgeport, Conn.

Bathtubs.
Dalton-Ingersoll Co., Boston, Mass.
Day Mfg. Co., Detroit, Mich.
Peck Bros. & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 Wes 28th St., N. Y.
Wilson, R. M., Rome, N. Y.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Taylor & Boggis Fdry. Co., Cleveland, O.

Ceilings, Metallic.
Eller, J. H. & Co., Canton, O.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Cement.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.

Chucks.
Whitlock, W., 39 Cortlandt St., N. Y.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Cincinnati Corrugating Co., Piqua, Ohio.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A. & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford, Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cream Can Fittings.
Geuder & Paeschke Mfg. Co. Milwaukee, Wis.

Cresting.
Green, S. & Son, Des Moines, Iowa.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Ofls, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Dinner Pails.
Trethaway Bros., Parsons, Pa.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Rhodes, Dickelman & Co., Forest, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Rhodes, Dickelman & Co., Forest, O.
Severding, Jno., Richmond, Ind.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
McLeod & Henry Co., Troy, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Foundry Facings Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Fouudry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Craig-Reynolds Foundry Co., Dayton Ohio.
Foskett & Bishop Co., 114 Liberty St., N. Y.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
May & Fiebeger, Akron, Ohio.
Michigan Stove Co., Chicago, Ill.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Thatcher Furnace Co., 240 Water St., N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Couch Bros., Mfg. Co., Dayton, Ohio.
Union Heater Supply Co., Detroit, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Cleveland Gas Machine Co., Cleveland Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N. Y.
Poorman Mfg. Co., Canton, Ohio.

Heaters, Steam and Hot Water.
American Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Foskett & Bishop Co., 114 Liberty St., N. Y.
Fuller & Warren Co., Troy, N. Y.
Glenmore Foundry & Mch. Co., Phila., Pa.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Mahony, M., Troy, N. Y.
Mowry, W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Smith Co., H. B., 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass.
Thatcher Furnace Co., 240 Water St., N. Y.
United States Heater Co., Detroit, Mich.
Weathered's, Thos. W. Sons, 139-143 Centre Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Shepard, Sidney & Co., Buffalo, N. Y.
Silver & Co., Brooklyn, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Ice Cream Freezers.
Tatum, S. C. Co., Cincinnati, Ohio.
White Mountain Freezer Co., Nashua, N. H.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Piqua, Ohio.
Gummey, Sperling & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Ladders.
Indiana Ladder Co., Indiana, Pa.

Lamp Heaters.
Aluminum Heater Co., Boston, Mass.

Lamp Stoves and Heaters.
Central Oilgas Stove Co., Boston, Mass.
Utter, Sam S., 113 Beekman St., N. Y.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.

Metallic Lathing.
Jersey City Galvanizing Co., 112 John St., N. Y.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Obermayer, S. & Co., Cincinnati, Ohio.
Smith, J. D. Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.

Oil Cans.
Central Oilgas Stove Co., Boston, Mass.
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges, Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Palm Oil.
Lambert, Stoughton & Cooper, Phila., Pa.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Caley, Edw. L. Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, John K., Phila., Pa.
Vedder Pattern Works, Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Platiug Co., Phila., Pa.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers' Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Bower, B. P. & Co., Cleveland, O.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Star Coupler Co., St. Louis, Mo.
Savill, Walls & Co., Phila., Pa.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Union Heater Supply Co., Detroit, Mich.
Wilson, R. M. Rome, N. Y.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water.
American Radiator Co., Chicago, Ill.
Exeter Machine Works, Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., N. Y.

Refrigerators.
Bower Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co. Grand Haven, Mich.
Columbia Refrigerator Co., Northville, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.
Illinois Refrigerator Co., Chicago, Ill.
Wayne, Jas. W., Cincinnati, Ohio.

Registers.
Buffalo Register Works, Buffalo, N. Y.
Ferrosteel, Cleveland, O.
Highton, Wm. & Sons, Bostou, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman Street, New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N. Y.
Silver & Co., Brooklyn, N. Y.
Wise, J. & Son., Butler, O.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel, Corrugated and Plain.
Acme Roofing & Supply Co., Canton O.
American Roofing Co., Cincinnati, O.
Berger Mfg. Co., Canton, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, O.
Globe Iron Roofing & Corrugatiug Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holtou Iron Roofing Co., New Lisbon, O.
Kauueberg Roofing Co., Canton, O.
Kansas City Metal Roofing & Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugating Co., St. Louis Mo.
Souther F. E. Iron Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGE 91.

Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Dwight Slate Machine Co., Hartford Conn.
Lyon, Conklin & Co., Baltimore, Md.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.
Rising & Nelson, West Pawlet, Vt.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co., Toledo, O.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Thoru Shingle & Ornament Co., Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Couch Bros. Mfg. Co., Dayton, Ohio.
Union Heater Supply Co., Detroit, Mich.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Steam & Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Pattern.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cope, G. W., Detroit, Mich.
Gobeille, Wm. Cleveland, Ohio.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Chency, S. & Son, Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Fox, Chas. F., Dayton, Ohio.
Stellwagen & Kynoch, St. Ignace, Mich.
Van Namee, G. L. Mfg. Co., Gouverneur, N. Y.

Stoves and Ranges.
Bibb, P. C. Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
DeHaven & Co., Pittsburgh, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co., Boston, Mass.
Mason & Davis Co., Chicago, Ill.
Michigan Stove Co., Chicago, Ill.
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Superior Steel Range Co, Cleveland, Ohio.
Taplin, Rice & Co., Akron, O.
Thatcher Furnace Co., 240 Water St., N. Y.
Van, John, Range Co., Cincinnati, O.

Stoves and Ranges, Gas.
Central Oligas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Grinberg Bros., 154 South St., N. Y.
Jones, L. B., St., Louis, Mo.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Central Oligas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, O
Dayton Mfg. Co., Dayton, O.
Grinberg Bros., 154 South St., N. Y.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Michigan Vapor Stove Co., Grand Rapids, Mich.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Troy Oil Stove Co., Troy, N. Y.
Utter, Sam S., 113 Beekman St., N. Y.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Pattern Rules.
Lufkin Rule Co., Saginaw, Mich.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Bruce & Cook, 186 to 190 Water St, N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Sperling & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila. Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Kieckhefer Bros. & Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Acme Roofing & Supply Co., Canton, O.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Brnce & Cook, 186 to 190 Water St., N.Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, Geo. A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.

Torches, Plumbers' and Tinners'.
Kendrick Valve & Washer Co, Syracuse, N. Y.

Traps and Vents.
Bower, B. P. & Co., Cleveland, O.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA, AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - - -	$1.00	SIX MONTHS, - - - - - - -	$22.10
ONE MONTH (5 Times), - - - - -	5.00	ONE YEAR, - - - - - - - -	40.30
THREE MONTHS, - - - - - - -	12.35		

Rates for larger spaces quoted on application.

DAVID WILLIAMS, Publisher.

96, 98, 100 and 102 Reade Street, NEW YORK. — **59 Dearborn Street, CHICAGO.**

New York (Main Office), - -	96-102 Reade Street, - - - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509 Hamilton Building, - - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - - - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - - -	HENRY SMITH, Manager.
St. Louis, - - - - - -	Bank of Commerce Building, - - - - - -	H. H. ROBERTS, Manager.
Boston, - - - - - - - -	146 Franklin Street, - - - - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.
AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

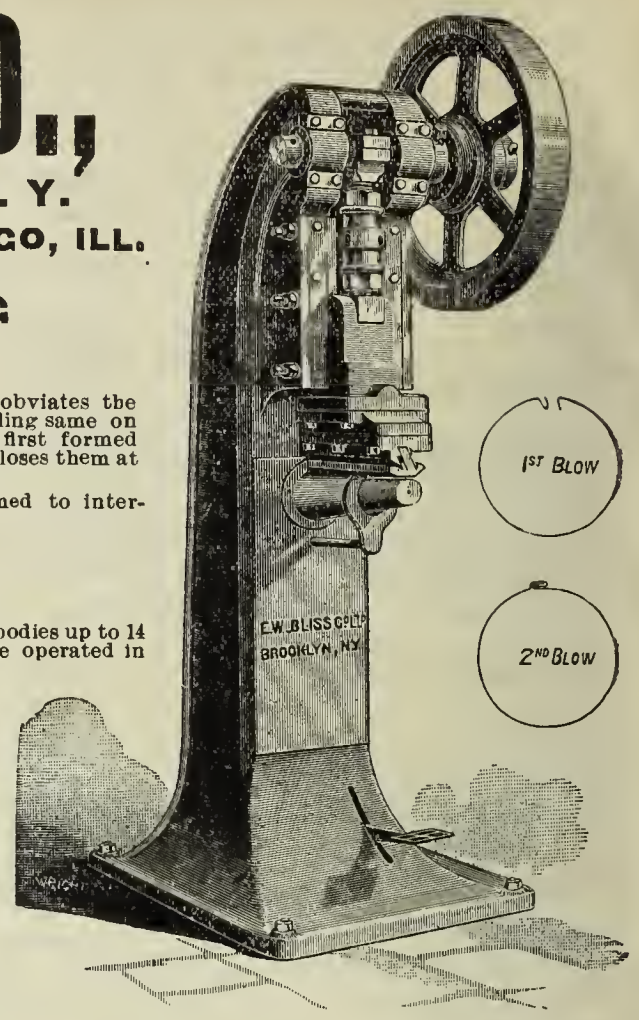
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.

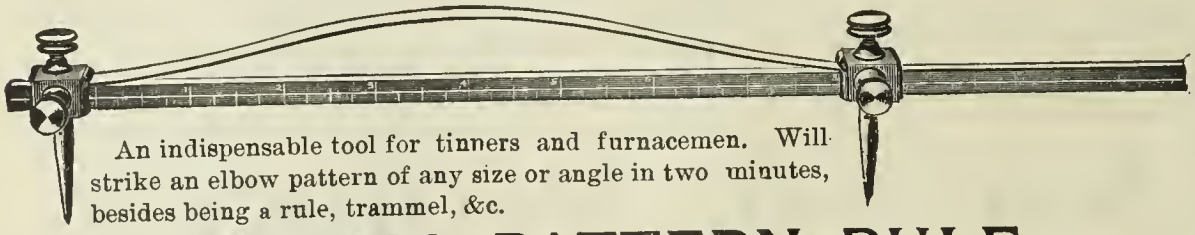


PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

DIES, SPECIAL MACHINERY &c.

THE STILES & PARKER PRESS CO.



An indispensable tool for tinners and furnacemen. Will strike an elbow pattern of any size or angle in two minutes, besides being a rule, trammel, &c.

"MAGIC" PATTERN RULE.

Price Reduced to $3.50 Net Cash.

Complete with Chart. Will pay for itself in a short time.

Send for Descriptive Circular.

LUFKIN RULE CO.,

SAGINAW, MICH.



— AN IMPORTANT MATTER WITH HIM.—Policeman (at entrance to burning building): "Where are you going, young man? Don't you know you'll be suffocated if you go into that place?

Chollie Wobbles: "I want, my deah fellah, to tell the firemen to throw those mattresses out of the window of that third floor front."

Policeman: "Why are you a fool, man? The idea of talking about saving mattresses at a time like this. What's wrong with you?"

Chollie: "But, my deah fellah, it's just this way, dontcher know; I had my trousers between those two mattresses getting pressed out."—*Pittsburgh Dispatch.*

— NO CAUSE FOR WONDER.—Mrs. Cawker: "I wonder why drum majors wear such frightfully big hats?"

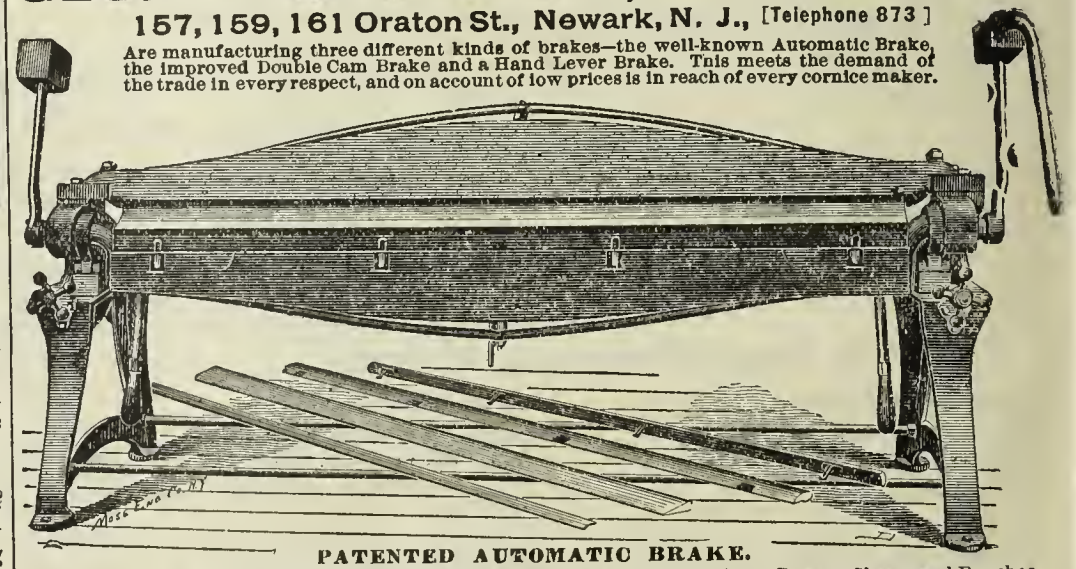
Mr. Cawker: "You wouldn't if you could once see the size of a drum major's head."—*Life.*

GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co.,

157, 159, 161 Oraton St., Newark, N. J., [Telephone 873]

Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

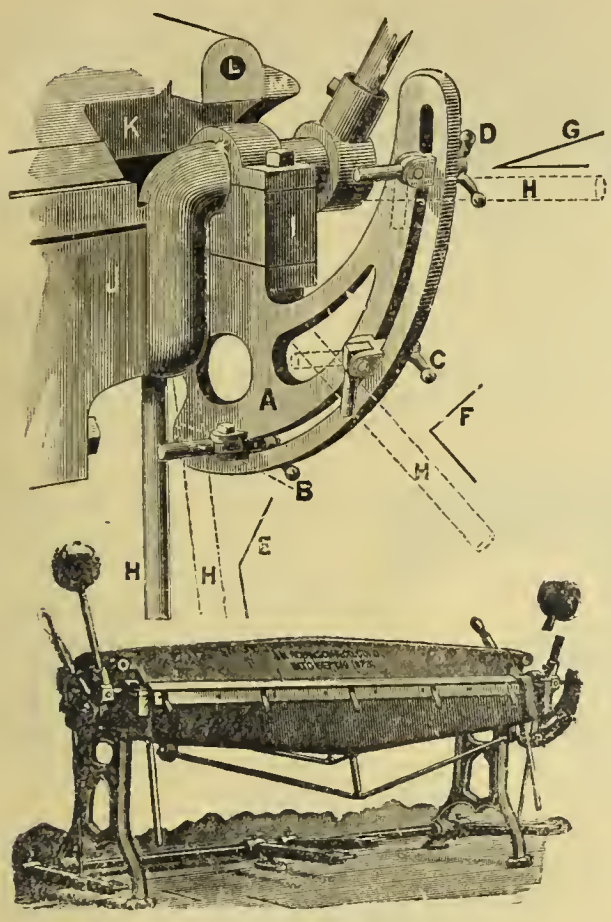
We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892. Send for our illustrated catalogue.

PATENT AUTOMATIC CAN BODY SEAMERS.

COMBINATION Presses and Dies,

SHEET METAL TOOLS, &c.

W. J. GORDON, 218 New St., **PHILADELPHIA, PA.**



THE PRINCIPLE UPON WHICH A CORNICE BRAKE

operates has much to do with its effectiveness. As this point was mainly considered when building the "Globe," we believe that in view of the large number in use, our Brake embodies more features of excellence than any other on the market. In this connection it may interest you to learn that we are the Pioneers in the manufacture of Cornice Brakes (36 years), and the knowledge gained concerning the requirements of a machine of this kind has enabled us to produce a tool that we believe to be perfect. Write for Prices and Catalogue.

J. M. ROBINSON & CO., CINCINNATI, O.

Builders of Sheet Metal Working Machinery.

THIS ADVERTISEMENT IS CHANGED WEEKLY.



All set up ready to use. Price, $30.00. Freight allowed to points as far West as Missouri River, and as far South as Galveston, Tex.

FOR SALE BY

Hall & Carpenter.
Philadelphia, Pa.
Austin & Dolen,
Boston, Mass.,
Hackett Hdw. Co ,
St. Paul, Minn.
and jobbers generally.

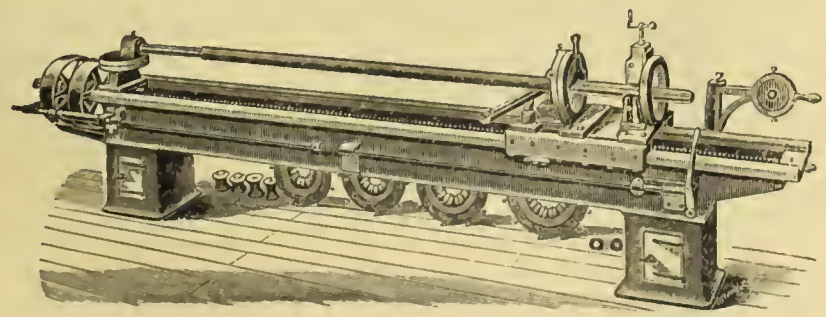
If your jobber can't supply you, order direct of the manufacturers.

SEND FOR CATALOGUE.

Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

JACOB BROMBACHER'S SONS, - No. 30 Cliff St., N. Y. City.
Established 1833. Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches ; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade Street, New York.

KEEP YOUR EYE



ON THIS SPACE.

From time to time we intend posting you on the merits of our goods, new productions, &c. Remember that for over 56 years our *celebrated "Bay State" Furnaces, Ranges and Stoves* have been sold extensively on their merits. *Do not forget* that the *"Bay State" Line* is the one to push and stand by. *Do not complete* your arrangements until you have *thoroughly investigated* our *manufactures. An inspection of our salesrooms and correspondence is solicited.*



Barstow Stove Co.,

NEW YORK, 228 Water St.

BOSTON, 56 Union St.

Foundries at Providence, R. I.

N. & G. TAYLOR CO.,

PHILADELPHIA,

Makers of

SOLDERS.

"HENDY" (brand), superior to any other Solder in the market. Intended for ware and special fine work. Extra fine quality.

"OLD STYLE" (brand) for ware. Best for roofing galvanized iron work, &c.

"N. & G. T. CO.'S 100 to 100," a fine Solder for general work.

"ROYAL" (brand), better than many makes of ½ & ½.

"½ & ½."

"COMMERCIAL ½ & ½."

PLUMBERS' SOLDERS.

"N. & G. TAYLOR CO.'S FINE WIPING," in cakes or bars.

"N. & G. TAYLOR CO.'S EXTRA WIPING,"

STEREOTYPE, ELECTROTYPE METALS, BABBITS, &c., &c.

We solicit your inquiries and orders for any special proportions desired.



L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK,

TINNERS' TOOLS and MACHINES, TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOOK.

By far the best Spout made. Greatly improved this season. More used every year than all others combined. Sold by leading jobbers everywhere, and to them by

CHARLES MILLAR & SON, Utica, N. Y.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY.

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON.

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. Also WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.

Branch Office, 111 Water St., Pittsburgh, Pa.

HAMILTON'S

BEST REDIPPED AMERICAN ROOFING TIN

is DIPPED AND REDIPPED by HAND, and is NOT coated by machines through ROLLS like some plates that are lauded so highly by the makers, and the coating on Hamilton's Best Redipped is as heavy on the TOP half of the sheet as it is on the BOTTOM half. You have scales, test it. We can furnish machine coated plates with 20 lbs. of coating to the box of I. C. 20 x 28 at $11.50 per box, fully equal to any of the so-called extra coated plates.

JOHN HAMILTON,
PITTSBURGH, PA.

McCLURE'S REDIPPED

ROOFING TIN.

AMERICAN MADE.

The finest and heaviest coated Roofing Tin made; guaranteed to contain **35 lbs. Coating** per 112 sheets.

A very important point in a Roofing Plate is to secure a uniform coating; **McClure's Redipped** is made by a process by which the coating is distributed **evenly over the sheet,** leaving no thick edges which are found on other "OLD STYLE" or "REDIPPED" plates, and which interfere to a great extent in working the sheets.

McClure's Redipped has been thoroughly tested and found to be of **superior quality** to any other "OLD STYLE" or "REDIPPED" plate made. A sample box will substantiate our claim.

McCLURE & CO., Pittsburgh, Pa.

Index to Reading Matter, Page 53

Index to Advertisements, Pages 87 - 89.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

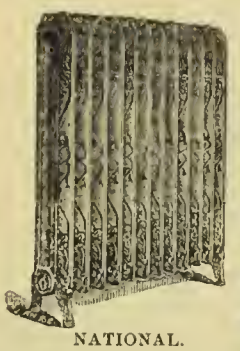
VOL. XLIII. NUMBER 10 | NEW YORK AND CHICAGO, MARCH 9, 1895. | ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

AMERICAN RADIATORS

HONESTLY CONSTRUCTED.
POSITIVE CIRCULATION.
ARTISTIC, SIMPLE, DURABLE.

Endless variety of styles.
Largest makers in the world.

AMERICAN RADIATOR COMPANY



NATIONAL.

NEW YORK. BOSTON. PHILADELPHIA. ST. LOUIS. MINNEAPOLIS. DENVER. LONDON, ENG.

111-113 Lake St., CHICAGO, ILL.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F & W Co.

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.

FULLER & WARREN CO. TROY, N.Y.

HOT AIR PARAGON FURNACES

ISAAC A. SHEPPARD & CO.
MANUFACTURERS
PHILADELPHIA, PA.
AND
BALTIMORE, MD.

SIX POINTS

1. FEWEST JOINTS. 2. EQUALIZED DRAFT
3. LARGEST RADIATING SURFACE
4. ABSOLUTELY SELF CLEANING
5. BALL BEARING GRATE
6. PERFECT ADAPTABILITY TO ANY KIND OF FUEL.

OUR FURNACE BOOK
"HINTS ABOUT HEATING"
MAILED FREE
IT WILL INTEREST YOU
IT MAY
HELP YOU

Apollo Best Bloom

There is great difference in galvanized iron.

You can always get flat sheets and workable iron, if you buy of a first-rate jobber. No jobber that has any careful trade could hold it without the Apollo brand.

There are three reasons for selling common iron: (1) it costs less by the ton, and generally is sold for the same in small quantities; so the profit on it is greater; (2) it is good enough for some uses; (3) and many metal-workers don't know the difference.

The difference is: the Apollo is flat (no buckling) and soft (no breaking when bent) and true to gauge—(no loss in buying by weight and selling by measure.).

APOLLO IRON AND STEEL CO

PITTSBURGH PENNSYLVANIA

WORKS AT APOLLO

Write for new Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES

HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.

"Kitchen Boiler Connections."

A Selection of Practical Letters and Articles

—RELATING TO—

Water Backs and Range Boilers.

Compiled from *The Metal Worker*.
71 Illustrations.

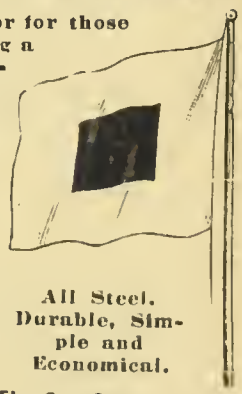
A Practical Helper. Price, $1.00.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG

Has no terror for those using a

FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.

EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO.,
Boston, Mass.



When you see this on a Valve,

TRADE JENKINS MARK

IT'S THE JENKINS BROS'.

The Simplest, Strongest, Surest,

For the Worst Place you have, and we guarantee it.

JENKINS BROS., 71 John St., New York. Chicago. Philadelphia. Boston.

KIELEY'S - STEAM - SPECIALTIES.

Pump Governor, Return Steam and Drain Traps, Steam and Water Reducing Valves, Noiseless Back Pressure Valves, Water Arches and Oil Separators.

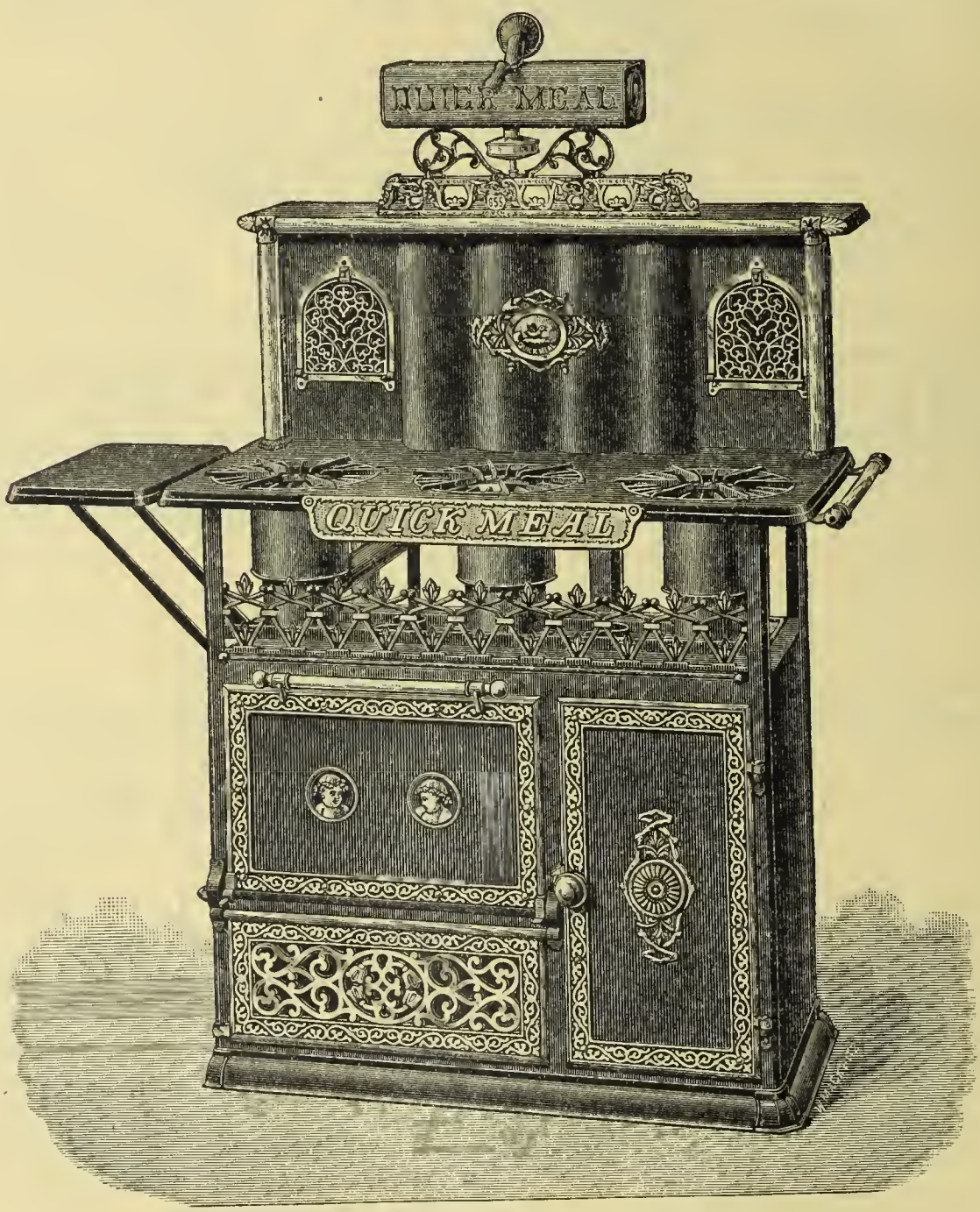
T. KIELEY, 7-17 W. 13th St., NEW YORK.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

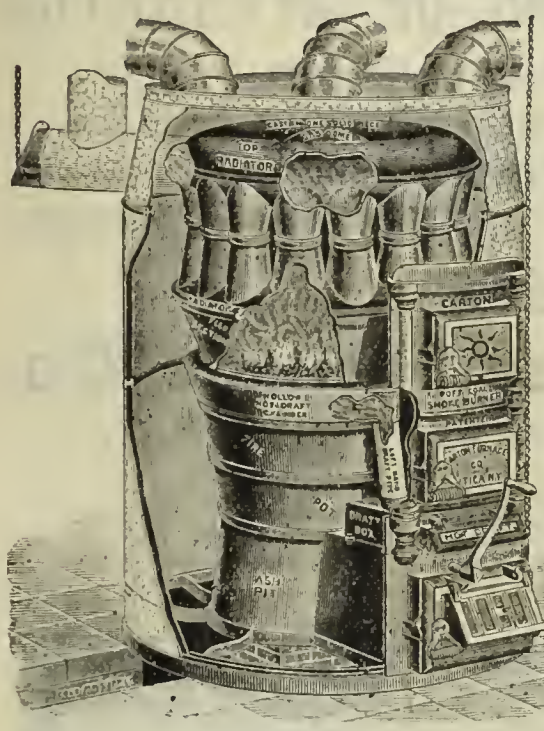
ST. LOUIS.

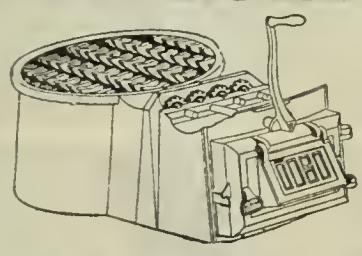
Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

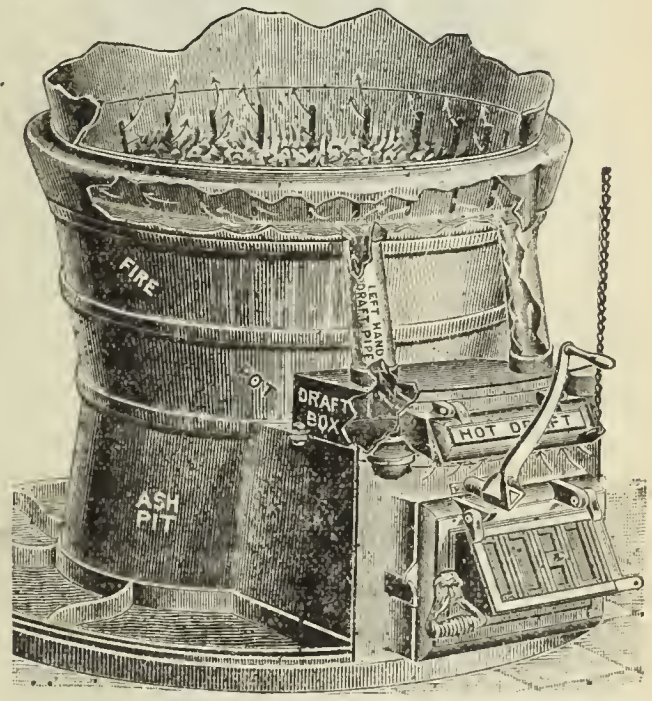
Hot Water & Steam Boilers & Furnaces.

OUR SOFT COAL SMOKE CONSUMER FURNACE.





Original "Smyth" Revolving Anti-Clinker. Grates.



Vertical Combustion Flues.

A Side Draft Furnace.

Large Combustion Chamber.

Perfect Combustion.

PRICES TO SUIT THE TIMES.—Our Catalogue and Prices will interest you.

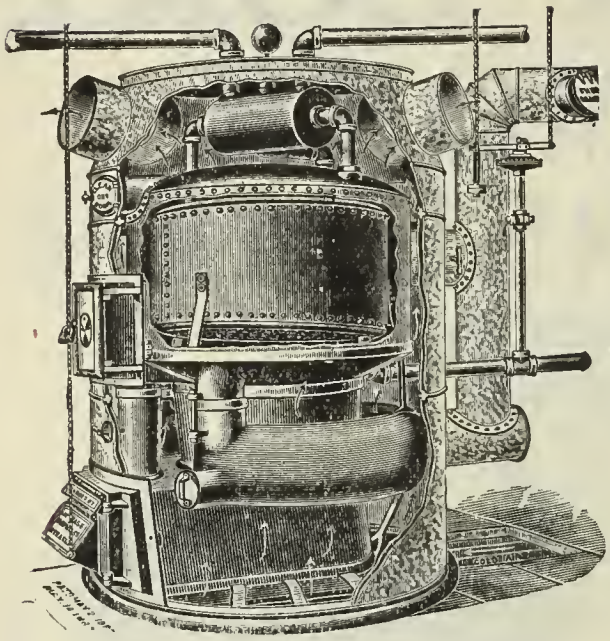
MANUFACTURED BY

CARTON FURNACE CO., UTICA, N. Y.

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

THE

Warren Steel Range.

IMPORTANT ANNOUNCEMENT.

To Jobbers and Retailers of Steel Ranges:

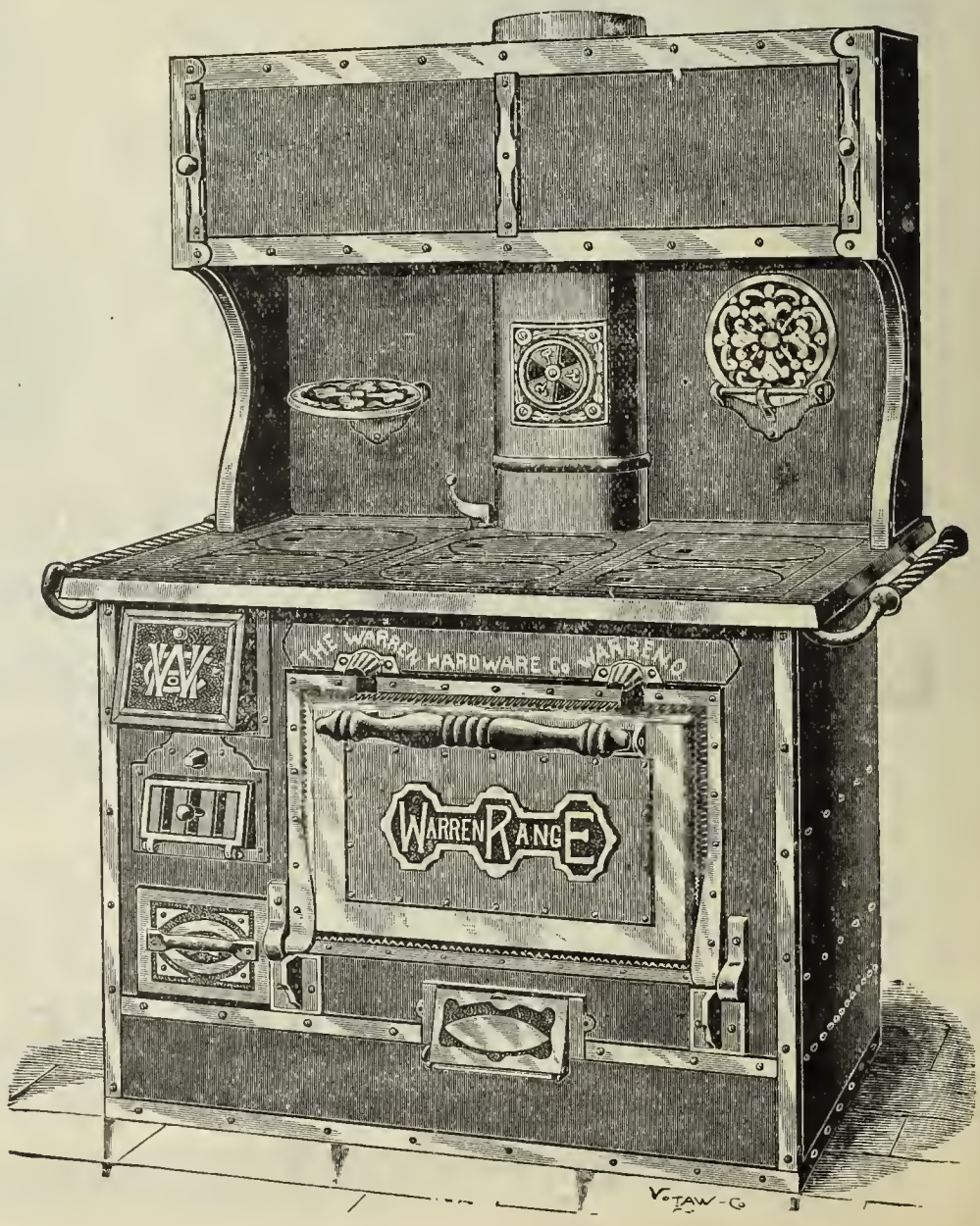
Don't fail before placing your order for Steel Ranges to get catalogue and prices on our new line of Warren Ranges for 1895. New and original and the finest line of Ranges on the market. With Duplex Grate to draw out front of range without disturbing fire linings. Full size opening of oven 18 x 20 x 14, 20 x 22 x 14 and 22 x 23 x 14. Lined throughout with asbestos. Write for prices and catalogue.

MANUFACTURED BY

THE WARREN HARDWARE CO.

7 Market Street,

WARREN, OHIO.

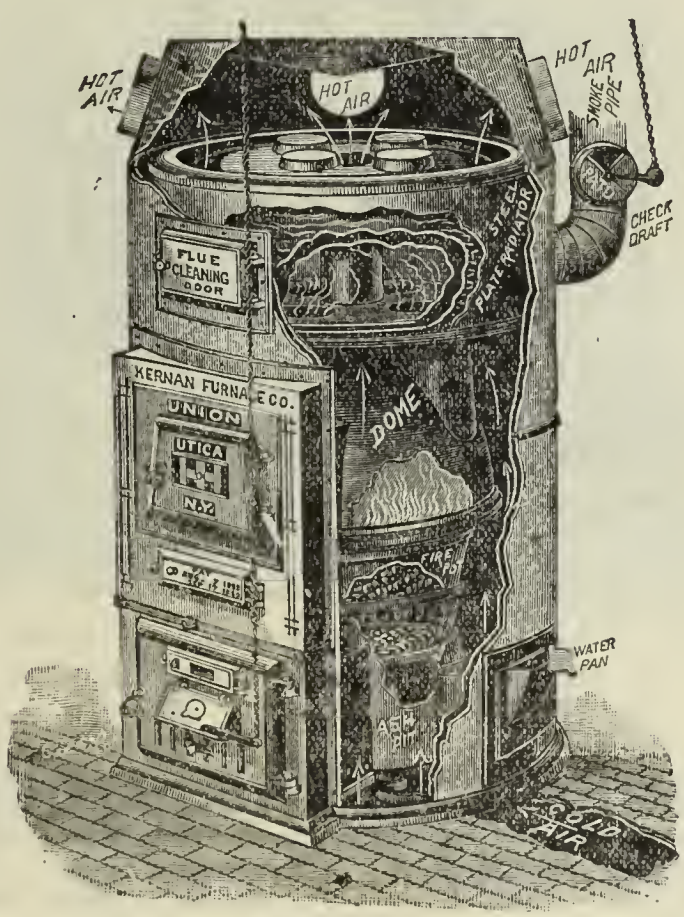


KERNAN

Union Furnace.

Good Thing.

Push It Along.

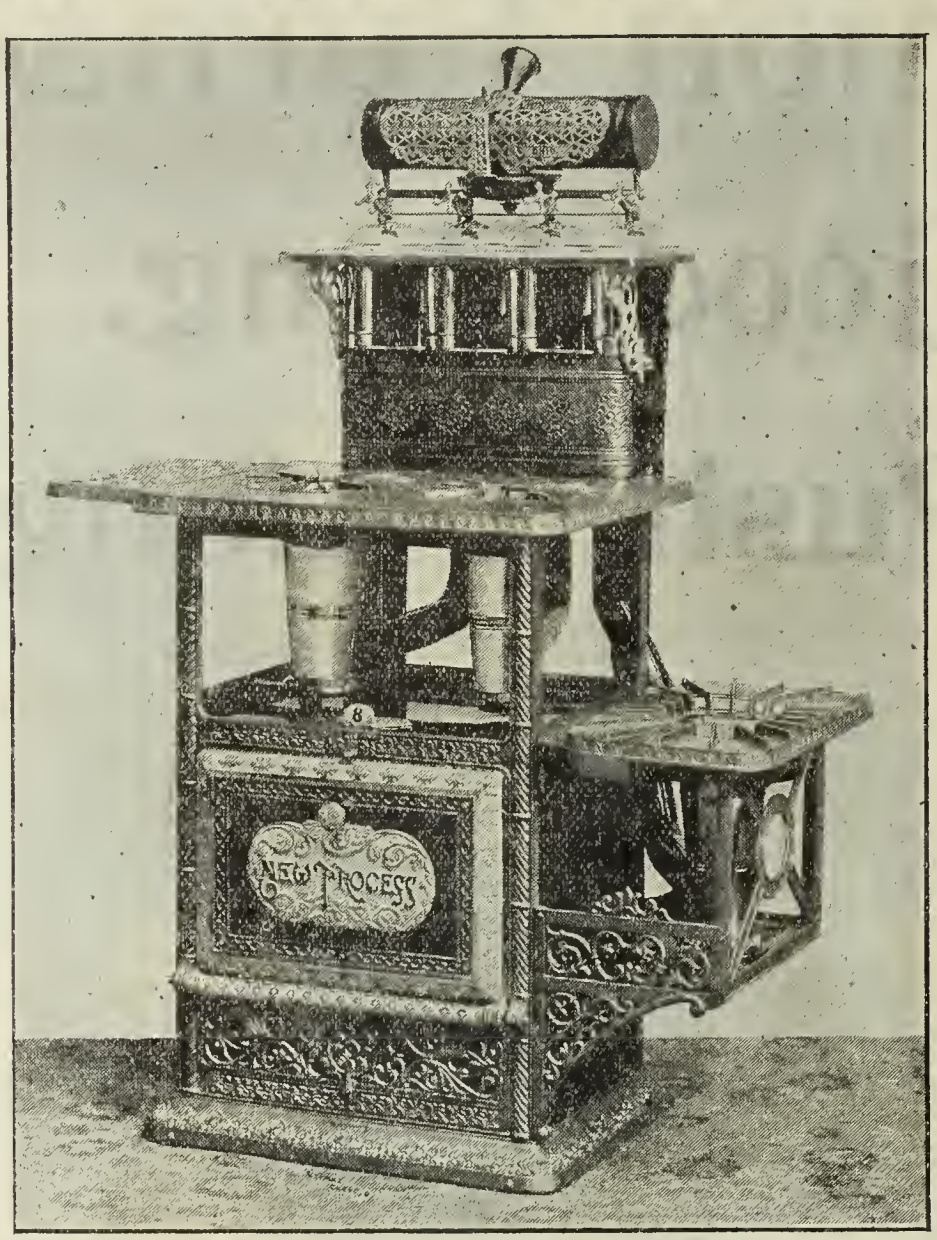


Made in six sizes, 28 to 51 inch Casings. With Steel Plate or Cast Iron Radiators.

Kernan Furnace Company,

CHICAGO, ILL. UTICA, N. Y.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better—to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

——MADE ONLY BY——

THE STANDARD LIGHTING CO.,
CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

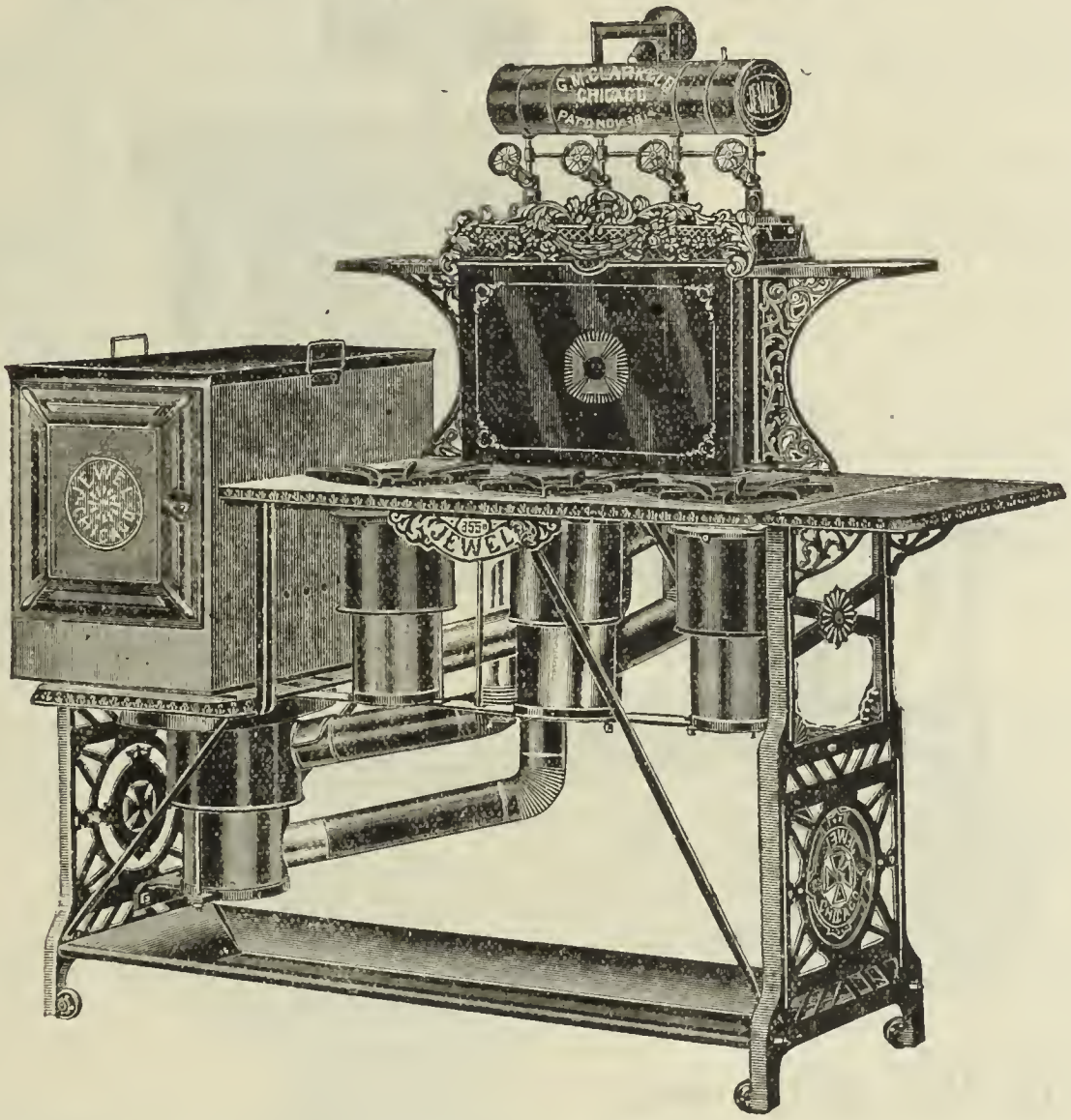
Eugene Mansell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
Milton Rogers & Sons, Omaha, Neb.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
H. Wetter Mfg. Co., Memphis, Tenn.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

WRITE FOR CATALOG.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

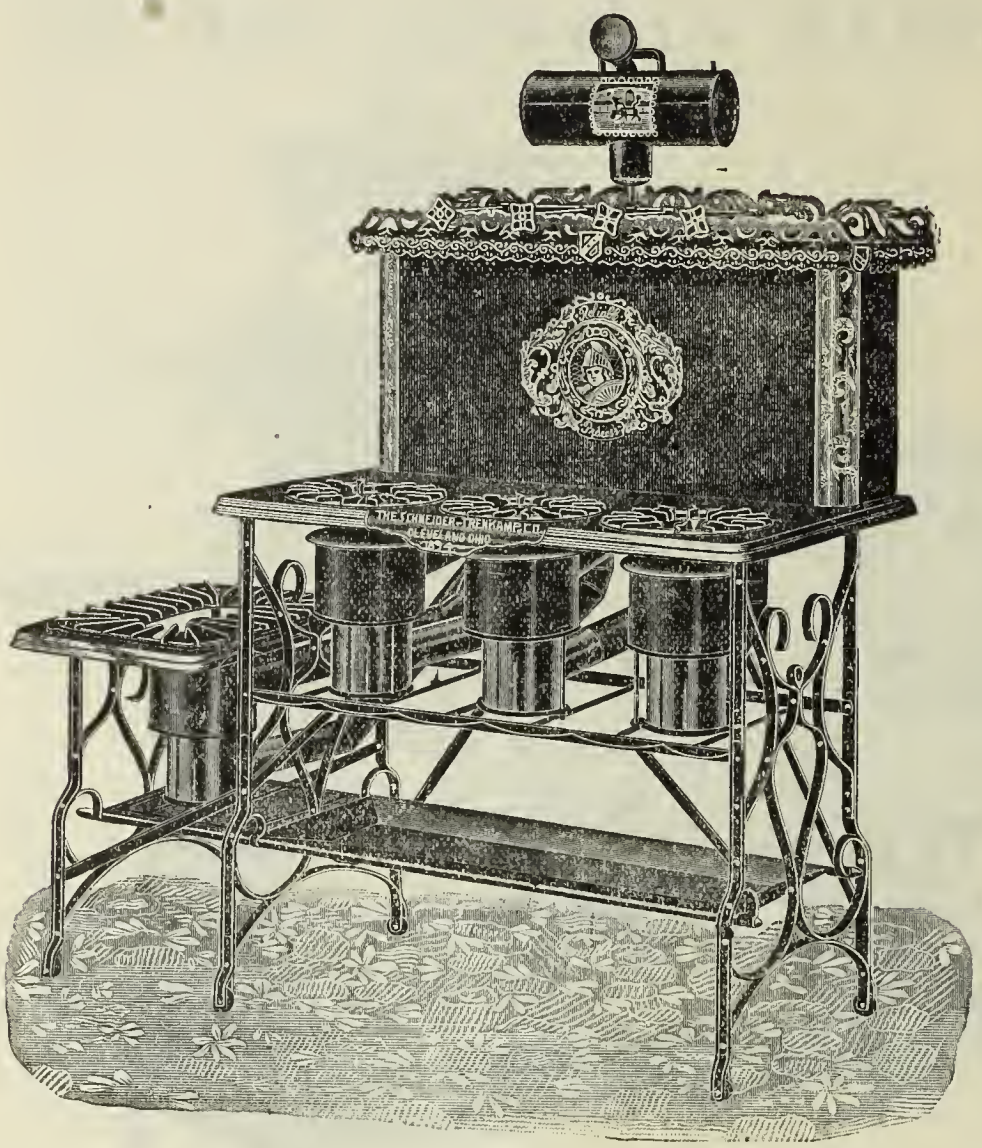
SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
BARSTOW STOVE CO., New York, N. Y.
W. W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

There are OTHERS,

But none that compare with the "Reliable."

SEE ? ? ?



This is not the only one,

Oh my, no. There ARE others,

as illustrated in our 1895 Catalogue, which can be had by writing

THE SCHNEIDER & TRENKAMP CO.,

67 Lake Street, Chicago. Cleveland, O.

OR OUR AGENTS:

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F FOX Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.
S. FAITH & CO., Philadelphia, Pa.—Eastern Pennsylvania and New Jersey.
HUNNICUTT & BELLINGRATH, Atlanta, Ga., and Vicinity.



WE CLAIM the L. & H. Stoves are the Best. Here is our L. & H. cabinet. How do you like it? It has many friends. Made under the Kitson and Lindemann patents. It is the finest Range on the market.

Send for our new catalogue. It contains the largest assortment of Stoves, Ranges, Ovens, &c., for gas, gasoline and kerosene.

A. J. LINDEMANN & HOVERSON CO.,

Branch House, Chicago, Ill. MILWAUKEE, WIS.

P. S.—Notice this advertisement. It will show a new improved Stove every week.

AURORA PROCESS STOVES

Sales in 1894 Doubled.

"AURORA" IS KING.



Brass Cylinders; German Silver Points (Rust Proof); Removable Drip Valves; Sight Feeds; Ornamental High Shelf Brackets; Extra Extension Shelf on all Stoves.

Full line of Hot Generating Stoves and Ranges.

Also Junior Stoves, High and Low, all with Drop Tank.

Fine line of Gas Ranges and Hot Plates.

We defy all Competition on finish, operation and style of "Aurora" stoves.

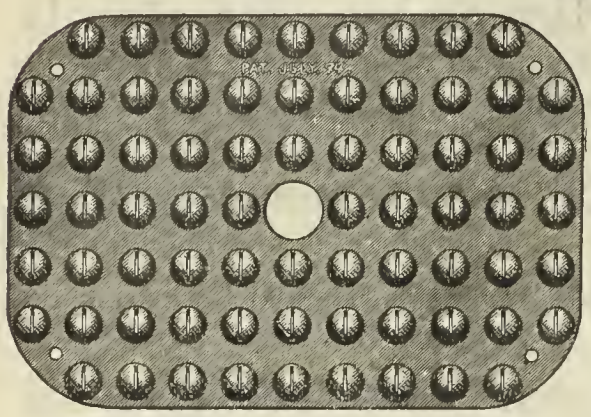
Send for 1895 Catalogue, now ready.

AURORA VAPOR STOVE CO., CLEVELAND, OHIO.

AGENTS:—THE PERRY STOVE CO., Albany, N. Y. H. W. PEAK, Fort Worth, Tex. JACOB RETTERER, Chicago, Ill. JAS. BEAKEY STOVE CO., St. Louis, Mo JANNEY, SEMPLE & CO., Minneapolis, Minn D. B. BAYLESS STOVE CO., Cincinnati, O. MAHOOD & Co., Philadelphia, Pa.

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.



No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*

OUR JET CONE BURNERS

distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

and

SPECIAL JUNIORS.



The Security Gas Range

WITH IMPROVEMENTS UP TO DATE.

This range has a ***DOUBLE OVEN*** which is guaranteed to ***DO DOUBLE*** the work of any ordinary oven at less cost. It is made for family use and has proved ***WONDERFULLY SUCCESSFUL*** wherever introduced. It will cook, bake, roast, and is the only stove which will ***BARBECUE A STEAK, AND WILL ALSO HEAT WATER QUICKER THAN ANY OTHER GAS STOVE ON THE MARKET.*** It is strongly built, neatly and tastily decorated and will prove ornamental as well as useful.

Write early and secure the Agency.

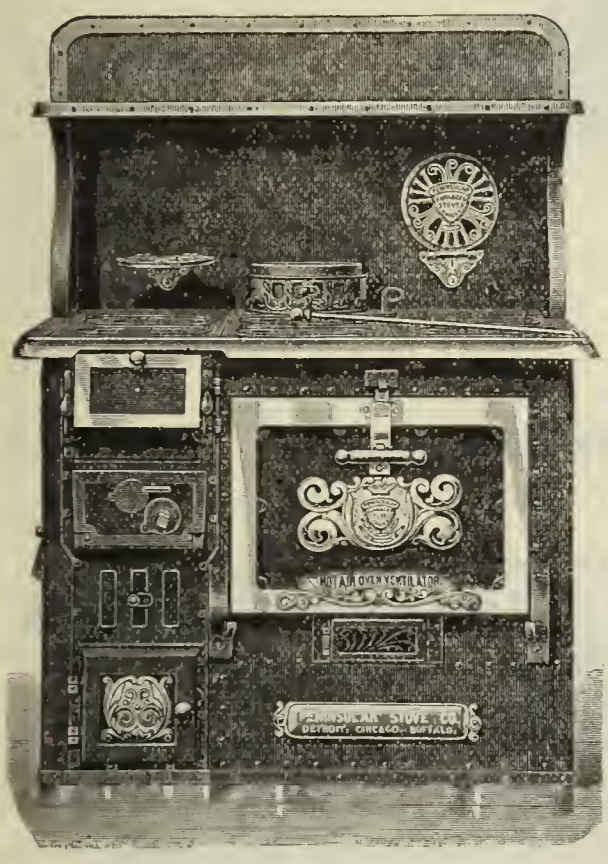
L. B. JONES,

ST. LOUIS, MO.,

Successor to

SECURITY GAS AND VAPOR STOVE CO.

PENINSULAR WROUGHT STEEL RANGES FOR 1895.



The only ranges from which Grate and Frame can be withdrawn without removing a single Plate or Bolt.

ANY STYLE OF TOP,

SIZE OF OVEN,

or COMBINATION DESIRED,

CAN BE SUPPLIED.

FOR

PRIVATE HOUSES,

HOTELS, RESTAURANTS,

OR PUBLIC INSTITUTIONS.

A COMPLETE NEW LINE

—AND—

THE ONLY ONE

Constructed with a

COMBINATION POUCH AND SWING FEED,

Which makes a

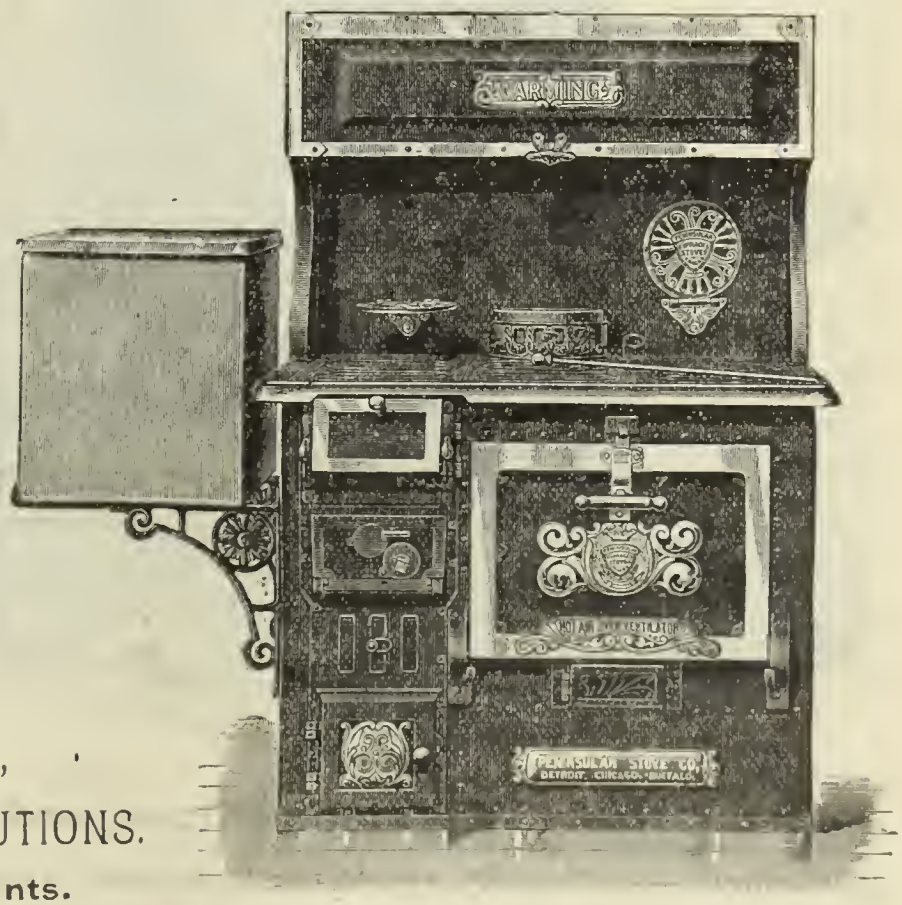
PERFECT AND PRACTICAL FIRE BOX

—FOR—

HARD COAL, SOFT COAL AND WOOD.

All Ranges are

ASBESTOS LINED.



Write for Catalogue and Discounts.

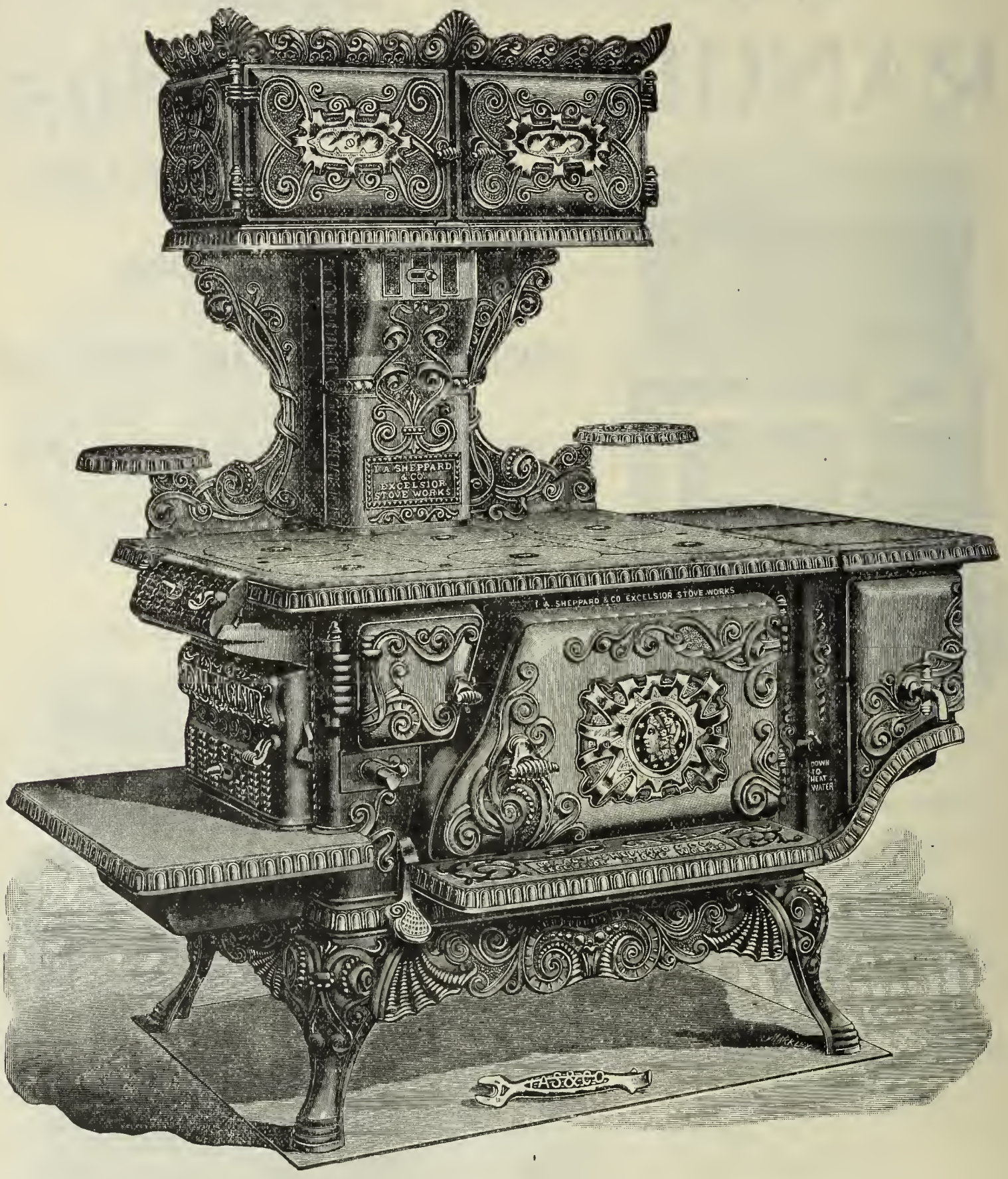
The Largest and Best Equipped Steel Range Manufacturers in the World.

THE PENINSULAR STOVE COMPANY,

DETROIT, CHICAGO, BUFFALO.

SOMETHING NEW AND STRIKING:

The Royal Excelsior Ranges!



Eighteen Sizes and Varieties.

(Cut shows Six-Hole Range With Reservoir, High Hot Closet and Cup Brackets.)

These goods will set your trade in motion this spring and keep it going indefinitely.

See Description on Opposite Page.

ISAAC A. SHEPPARD & CO., { PHILADELPHIA, PA. BALTIMORE, MD.

MANUFACTURERS.

Admirable Trade Accelerators!

RANGES THAT SELL!

To sell goods now-a-days they must fairly bristle with good points. When Mrs. Noah moved out of the ark and set up housekeeping on Mount Ararat, she might have been satisfied to bale out hot water from an encased reservoir with a dipper (always spilling some on the stove top, of course), but modern housekeepers prefer to draw it off through a spigot, as those who use the **ROYAL EXCELSIOR RANGES** do. (This is our own patent. That is why you don't find other manufacturers using it.) Then there is also our "**ECLIPSE COVER,**" Three points: 1. Shape makes it strong—no place in it for a crack to start. 2. Cover lifted ***at center of gravity,*** the easiest possible way to lift a weight. 3 Cover lifted at once ***from any position***—no pulling or pushing it around to bring lifter hole toward the operator.

Eclipse Cover.

Patented December 29, 189 .



Damper easily replaced through pipe collar, having no rods to warp or burn out. Large end Hearth, sliding forward. Deep, roomy Ash Pit, Bailed Ash Pan, &c. Fire Box fitted for Wood, or Hard Coal, or Soft Coal, as desired. Grates quickly removed without disturbing Fire Box Linings. Cross pieces so arranged as to bring four boiler holes directly into contact with the fire. Water Fronts for all sizes, with connections taken from the back to either right or left of range, so that circulating boiler may be used on either side. The Feet are independent of the Skirt Base, which bolts to the feet after the Range is set up, thereby enabling one man to put the entire apparatus in place. The design is the work of a superior artist. All edges are beautifully ornamented, and will look well as long as the range lasts (Ground edges are hard to keep from rusting while goods are in stock, and turn blue and lose their good looks at the first fire. The ornamented edge is one of the greatest improvements of modern stove making.)

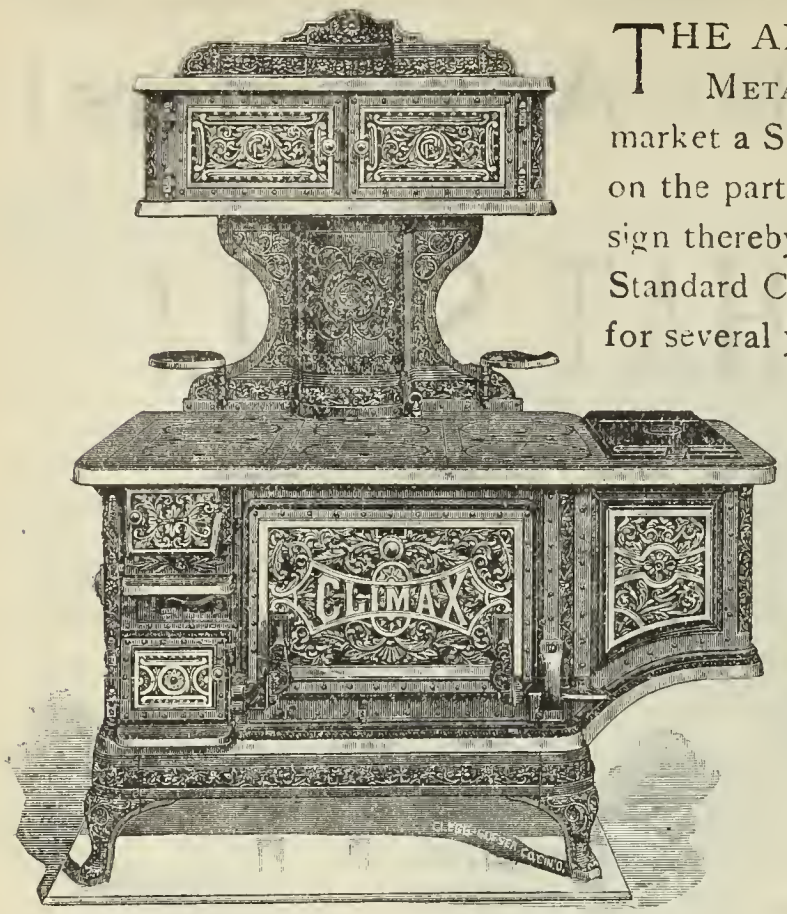
The mounting and fitting are of the best, and the added features of Nickeled "Alaska" Knobs, Nickel Name Plate, Nickel Oven Door Panel with Tile Center, Nickel Hinge Pins and Nickel Oven Door Pedal enhance the attractiveness of the goods

We cannot tell you all about these goods in a moment. Send to us for a descriptive and fully illustrated catalogue-circular. They are made with either four holes or six holes on top and with or without Reservoir.

If you buy one of these ranges, blacken it nicely and put it in a conspicuous place on your store floor, and within 30 days you are not satisfied with it, you may send it back at our expense. (If you keep it over 30 days, of course it's a sale.) Does this proposition strike you as fair?

ISAAC A. SHEPPARD & CO.,

Philadelphia and Baltimore.

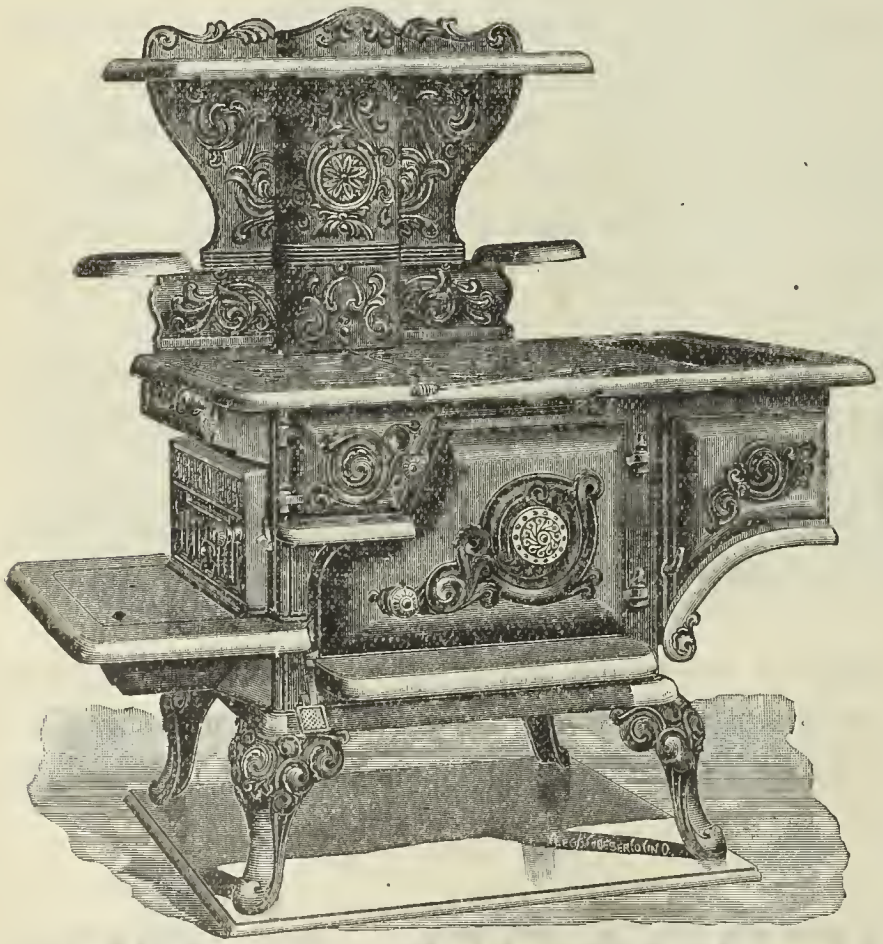


THE ANNOUNCEMENT in a recent issue of THE METAL WORKER that we are soon to place on the market a Steel Climax Range having prompted the inquiry on the part of some of our patrons as to whether we design thereby to abandon the manufacture of our Celebrated Standard Climax Range, which has maintained supremacy for several years as an established leader of its class and against which not a single complaint has been filed in our office, we desire by this to inform the trade that the reputation of the Climax Range and constantly increasing demands for same is such as to preclude the possibility of abandonment if we felt disposed to do so. The Range, we are pleased to say, is more popular than ever, and the manufacture of same will be continued in all its varied conventional styles and sizes, and we sincerely trust that none will be deceived into a belief that an ***imitation*** now being offered to the trade is as good as the initial construction, which can only be procured of

TAPLIN, RICE & CO., AKRON, OHIO.

Southern Queen

for Coal, with Flush Reservoir and High Shelf—a



PECULIARLY PRACTICAL, PERFECT PRODUCTION

Of the Stove Makers' Art. All the advantages of a High-Priced Range at the cost of a low-priced Cook Stove. Made in the best possible manner, of the best material, and is a stove to catch Customers with every time. Write for Catalogue and Prices.

The Portsmouth Stove & Range Company,

Portsmouth, Ohio.

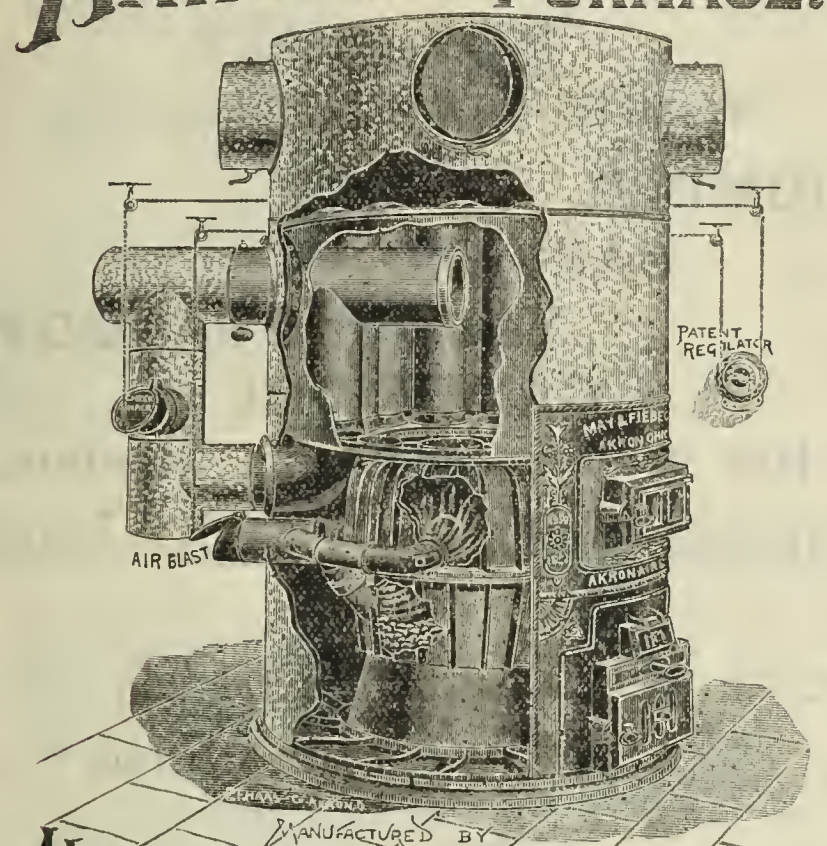
AGENTS:

R. ROBINSON & SONS, Chicago, for the Northwest.
A. L. CANFIELD, 284 Pearl Street, New York, for New England States.
C. F. HAKE & SONS, for Cincinnati and Vicinity.
HOME STOVE CO., Indianapolis, Ind.
W. E. ANTHONY & CO., Detroit, Mich.; Mich. and Minn.
BRADLEY, MUNK & CO., Columbus, Ohio.

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.

"JUST AS GOOD AS THE AKRON 'AIR BLAST' FURNACE,"

AKRON AIR BLAST FURNACE.



Has become a familiar expression with the stove trade in many States.

Don't you want to make your competitors use it? Why it is so commonly used, is a Think to thought about.

WE ARE IN IT.

The past extremely cold weather has clearly demonstrated that.

THE ORIGINAL AKRON AIR BLAST FURNACE and its many agents are strictly in the swim. There is no weather too cold for us.

After twenty-five years' experience with the best furnaces made our Mr. May was convinced by careful experimenting and studying that they were not built on scientific principles, and therefore he invented and six years ago perfected the "Air Blast" principle for burning coal, which he has applied to the Akron Air Blast Furnace, and it has been so successful in burning all kinds of fuel, especially soft coal, that it has completely revolutionized the furnace business, and all manufacturers of the best furnaces are now trying to imitate it. The Akron Air Blast Furnace is the original and leader. Others follow.

THOUSANDS of users are glad to testify to its merits and its economy.

HUNDREDS of dealers are happy with its success.

DOZENS of imitators are wondering how it took its place at the front in so short a space of time.

ONE special dealer we are desirous of informing as to why the Akron Air Blast Furnace has such a wonderful record. You we mean. Write us.

Build up your trade with a certainty. No need of making furnace work a hit and miss.

Can you equal the following record with the furnace you are selling?

We have hundreds of agents in Ohio, Indiana, Illinois, Iowa and other States whose experience is equal to this. Carload and duplicate orders from them prove that their trade is increasing.

76 Furnaces Sold

AND NOT ONE COMPLAINT.

THE

Akron "Air Blast" Furnace

Has proven a Record Breaker. Even in hard times our agents have been busy. You should secure agency at once and be in the race at the front.

READ THE FOLLOWING LETTER:

OFFICE OF
WELCH & HORTON,

NEW CASTLE, Pa., March 23, 1891.

Messrs. May & Fiebeger, Akron, Ohio.

GENTLEMEN: We took the agency of the Akron Air Blast Furnace late in the season of 1891, and have sold up to the present time 76 Furnaces, and have not had a complaint from a single furnace, which we consider is the best recommendation the furnace can have. Our furnace trade has been affected less by the hard times than any other line of goods we handle which shows that people always find the means with which to buy a good article.

The Akron Air Blast Furnace has established a reputation for itself through Lawrence County that other furnaces cannot overcome, and when they make a sale it is to parties who look at price and not the furnace. We know that we have the best furnace on the market to-day and our customers know it, too. Wishing you success for 1891, we remain, Yours respectfully

WELCH & HORTON.

Welch & Horton's Sales Have Been:

8	Akron	Air Blast	Furnaces	In 1891
30	"	"	"	1892
38	"	"	"	1893
34	"	"	"	1894

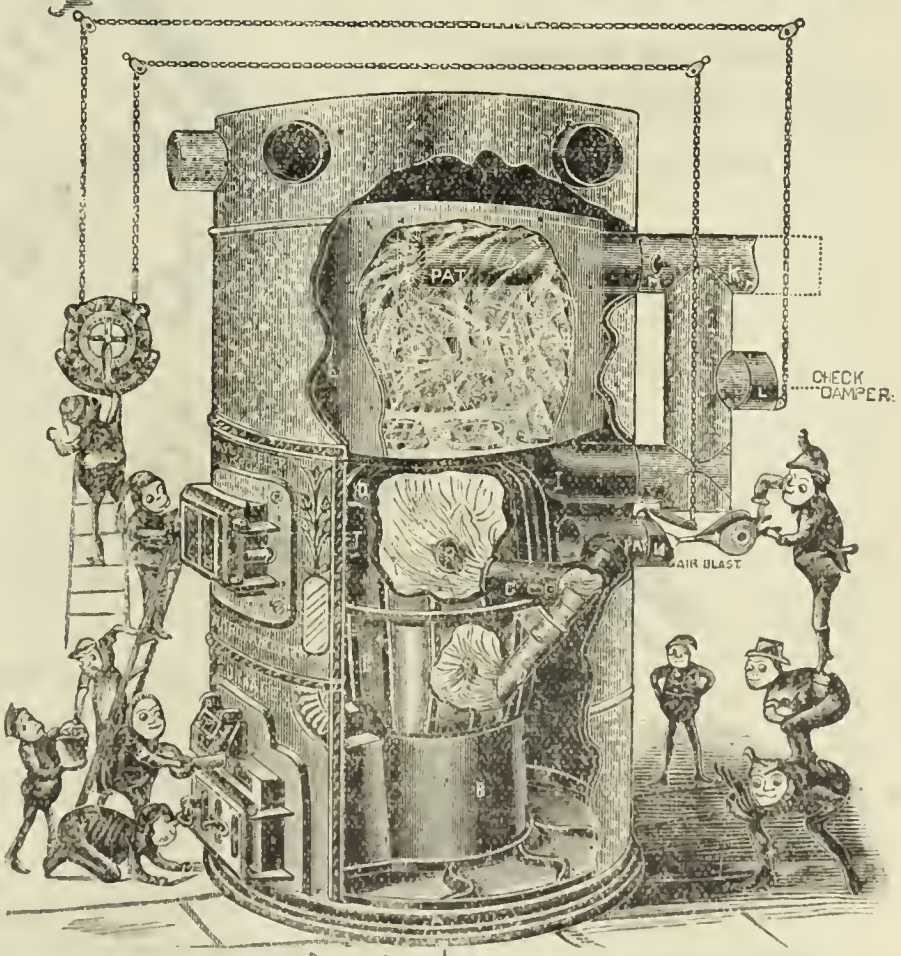
M. & F

Write for Catalogue Secure the Agency before some live competitor of yours gets it.

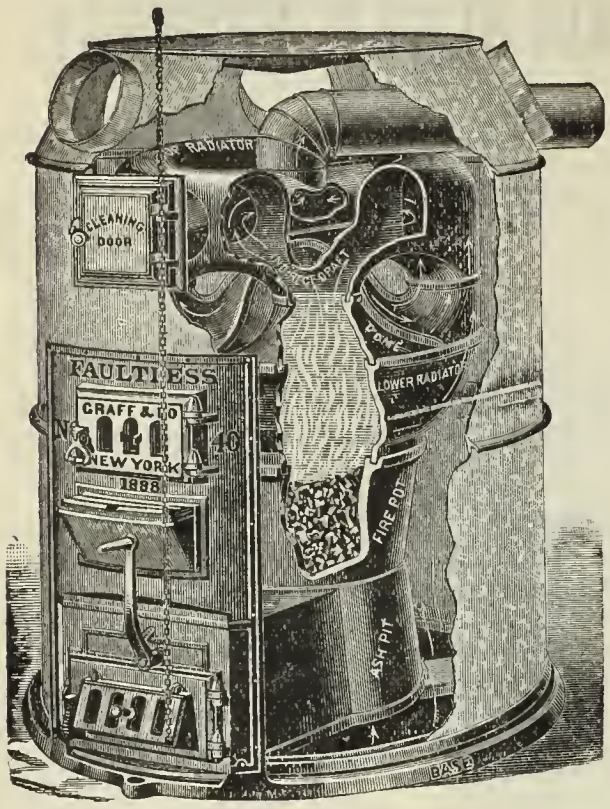
MAY & FIEBEGER, Mfrs.,

Akron, Ohio.

AKRON AIR BLAST FURNACE.



FAULTLESS.



SUPERIOR GOODS.

FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.
HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.

Faultless, Elegant and Columbian Ranges.

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.

The Craig-Reynolds F'd'y Co.,

DAYTON, OHIO.

WESTERN BRANCH:
GEO. D. HOFFMAN, Mgr.,
82 Lake St., Chicago, Ill.

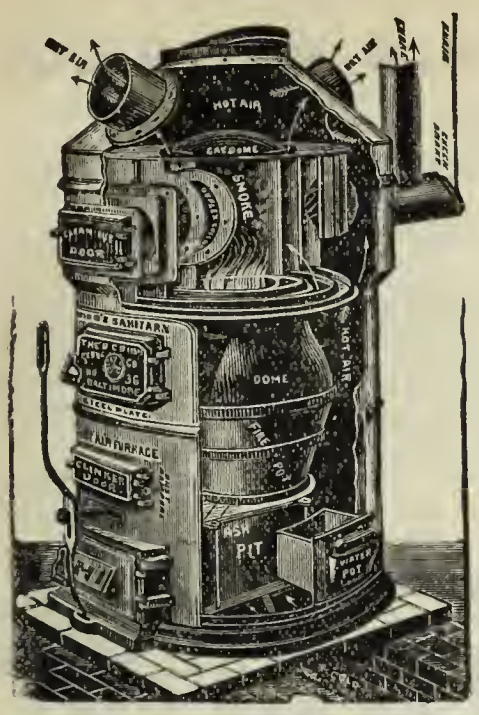
Because Oppor=tunities may have been neglec=ted in the past,

Is no reason why they should be at the present time. If you are contemplating or figuring on heating installation during the approaching building season, we would suggest you investigate our line of six styles and 30 sizes of Furnaces and obtain our price. It will be money in your pocket.

WRITE US FOR

The 1895 Catalogue of the Triumph Heaters,
OR
The Principles of Heating and Ventilation,
with Facts and Figures,
OR
The Picture Book,
OR
The Triumph Estimate Book,
all published for the use of the trade.

Patent *STEEL* Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

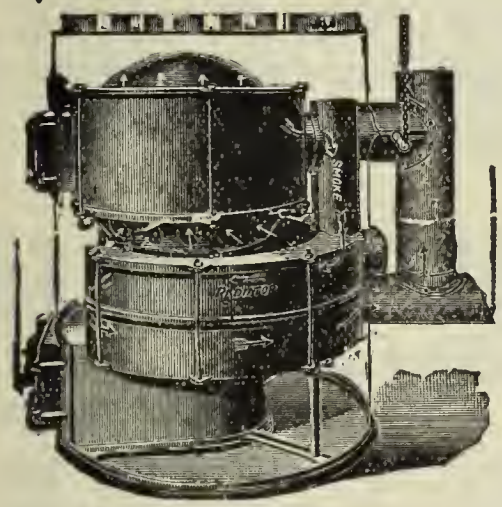
The arrangement for shaking and dumping the grate surpasses all others—no opening of door necessary; also

BIBB'S ORIGINAL

Baltimore Fire Place Heaters

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.
Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME: SECTIONAL FIRE POTS; STAR GRATE.
IT IS A GREAT ECONOMIZER OF FUEL.
IT IS A LOW FURNACE.

CORNING, N. Y., January 16, 1895.
Gentlemen: The No. 40 Victor you set in '91, and the No 45 Victor set in '92 are doing good work, with an economical use of coal, and this month the Thermometer has shown on several days a record from 7 to 22 degrees below zero.
Respectfully yours,
J. P. YOUNG.

Agents wanted. Address
THE CORNING MANUFACTURING CO.,
Corning, N. Y.

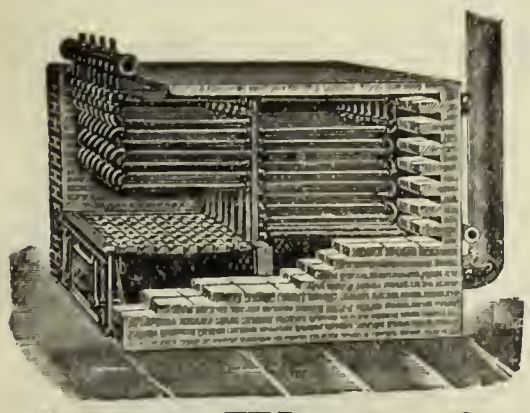
DO NOT CUT THIS OUT.
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers
Are the Best
—FOR—
Steam or Hot Water Heating.
—o—
Send for Catalogue.

NEW YORK CENTRAL IRON WORKS CO.
THE DUNNING BOILER
TRADE MARK
GENEVA, N.Y. U.S.A.

The Dunning Boilers
ARE MADE OF
Wrought Iron or Steel
AND HAVE NO
Packed Joints.

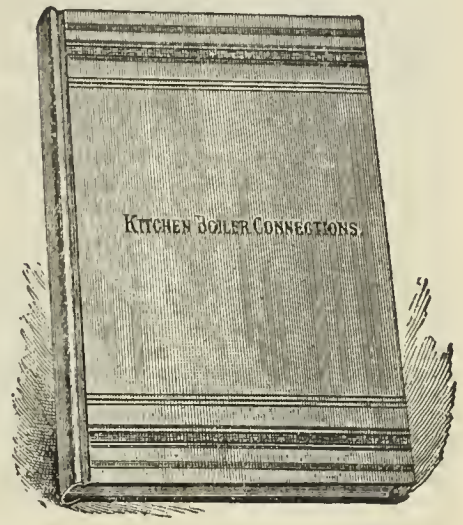


The Electric Boiler
—FOR—
Steam and Hot Water Heating and for Steam Power.
MANUFACTURED IN
Over 300 Different Sizes.
SEND FOR CATALOGUE TO

The Electric Boiler Co.,
23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST.,
ROCHESTER, N. Y.
New York Office, 44 Dey Street.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF
Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth,
Price, $1.00

The book is well got up and the information well given Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,
96-102 Reade Street, NEW YORK.

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

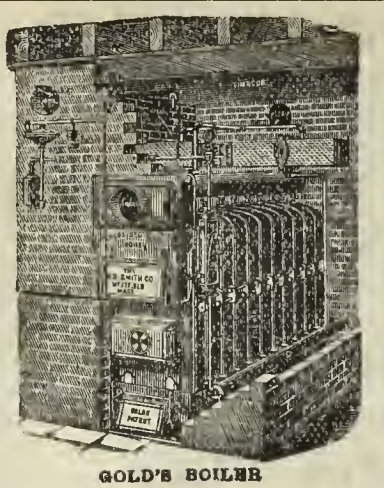
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



GOLD'S BOILER

THE H. B. SMITH CO.,

MANUFACTURERS OF

Steam and Water

Heating Apparatus

FOR

PUBLIC BUILDINGS AND PRIVATE RESIDENCES

SPECIALTIES:

Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
Reed's Improved Cast-Iron Radiators,
Gold's Indirect Pin Radiators,
Breckenridge's Patent Automatic Air Valves.
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for hard or soft coal.

Office & Warerooms, 137 Centre Street, New York.

FOUNDRY, WESTFIELD, MASS.

Catalogues Sent on Application.

STEAM
HOT WATER
WARM AIR
FOR HEATING ALL CLASSES OF BUILDINGS

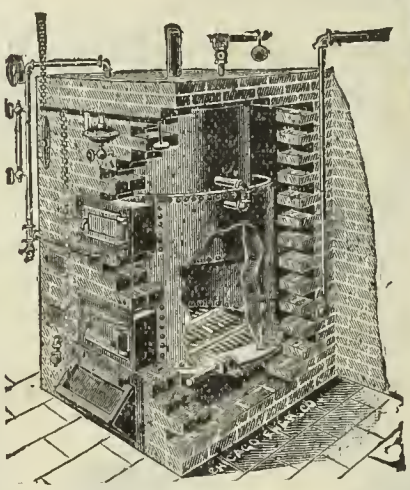
CAPITOL HEATERS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.



HAXTUN BOILER

FOR STEAM AND

HOT WATER HEATING

Magazine with Front Feed—can use **HARD or SOFT COAL.**

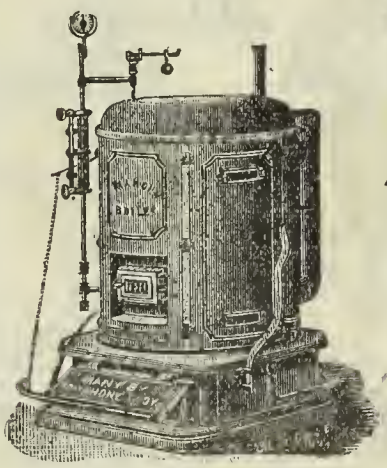
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



THE MAHONY BOILERS.

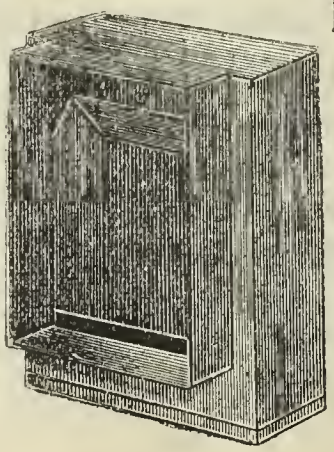
For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



Novelty Ventilated Wall Pipe,

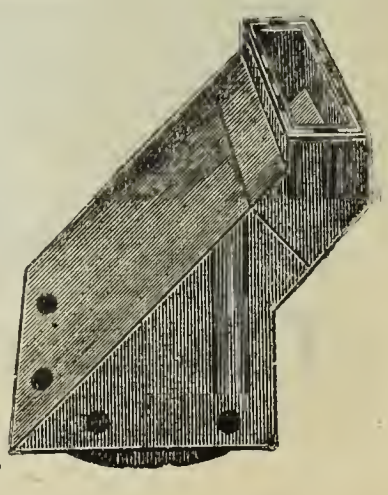
Absolutely Fire Proof.

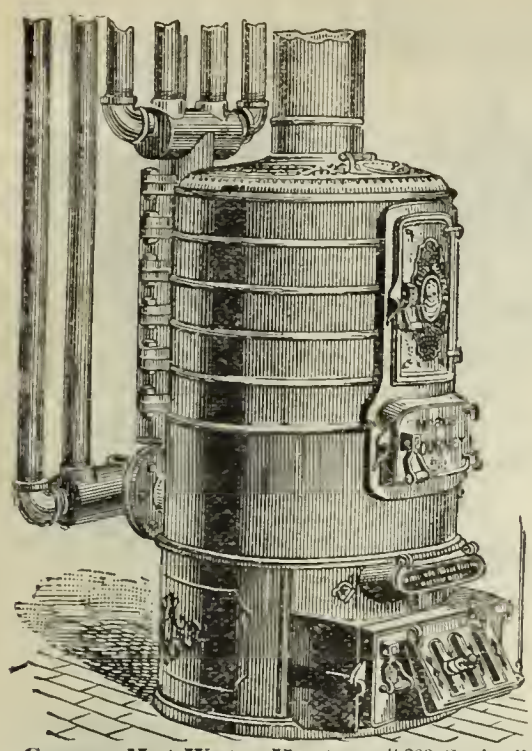
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER

18 Wood Street, Pittsburgh, Pa.





Gurney Hot Water Heater. "300 Series."

A GUARANTEE OF EXCELLENCE.

The Name **Gurney**

Used in connection with **Heating Apparatus** denotes **FINEST PRODUCTION.**

HOT WATER HEATERS, STEAM BOILERS, RADIATORS.

ALWAYS EQUAL TO THE OCCASION.

Send for Trade Catalogues.

SOLD ONLY TO THE TRADE.

GURNEY HEATER MAN'F'G CO.,
163 Franklin St., Cor. Congress,
BOSTON, MASS.
Western Selling Agents:
A. A. GRIFFING IRON CO., 34 Dearborn St., Chicago, Ill.

FURNACE JOBBERS AND LARGE DEALERS

Are particularly requested

NOT

to close contracts for 1895 before seeing our

New Catalog

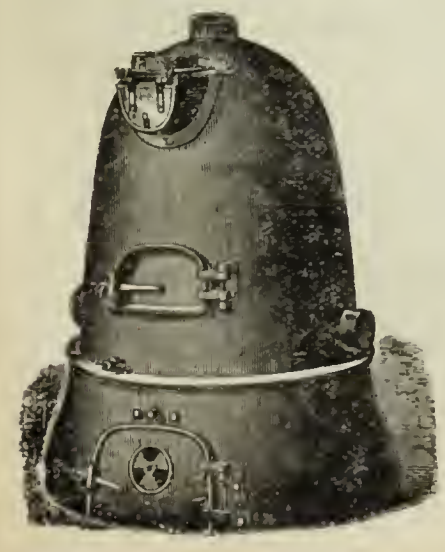
and obtaining our prices, terms and special inducements on large quantities of

Standard Furnaces.

GIBLIN & CO.,

Large exclusive territory given.

Utica, N. Y.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

139, 141 and 143 CENTRE STREET, - - NEW YORK.

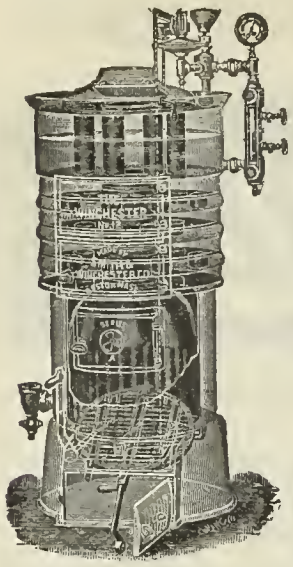
ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**



The Winchester



Has more **COMMENDABLE**

And less **OBJECTIONABLE FEATURES**

Than any Heater on the Market.

—MADE BY—

SMITH & WINCHESTER CO., Boston, Mass.

Our prices on these Heaters will please you. Send for them.

ROYAL HEATERS.

SOLD ON THEIR MERITS. NOT ON THEIR ANTIQUITY.

HOT WATER. STEAM. HOT AIR. COMBINATION.

LARGEST ASSORTMENT OF STYLES AND SIZES.

CATALOGUES GIVE FULL DESCRIPTION.

CORRESPONDENCE SOLICITED.

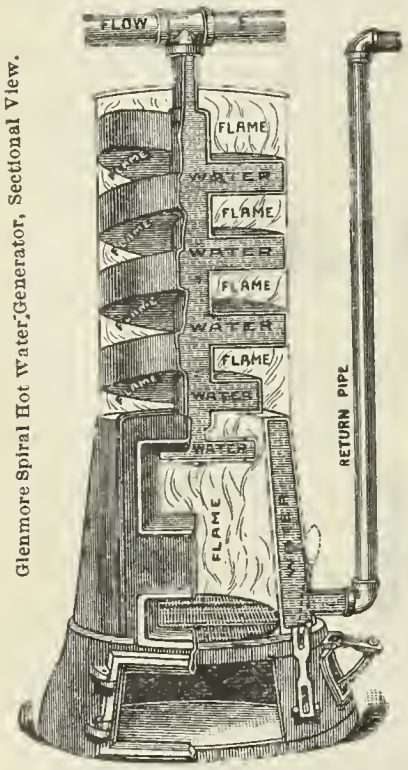
MANUFACTURED BY

HART & CROUSE.

UTICA, N.Y.

NEW YORK. 211 WATER St.

CHICAGO. 79 LAKE St.



Glenmore Spiral Hot Water Generator, Sectional View.

THE GLENMORE

Spiral Hot Water Generator.

(PATENTED.)

For General Heating Purposes, but Especially Adapted to House Heating.

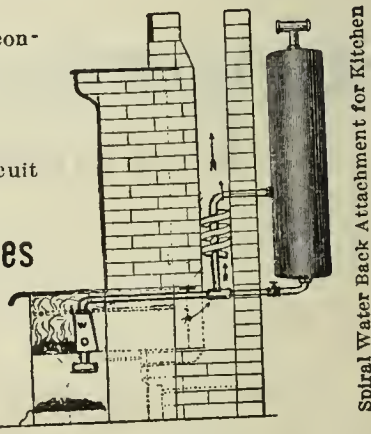
COMMENDATORY POINTS:

Simple construction. Practically composed of two sections, consequently few joints and nothing to give out.
Large heating surfaces.
Products of combustion fully utilized.
Instantaneous generation of hot water.
Free and easy circulation.
Easily cleaned fire surfaces.
Hot water may be drawn off at any point along the pipe circuit without materially affecting the heating service.
Grate conducive to economy in fuel.

Spiral Water Back Attachment for Kitchen Ranges

By utilizing waste heat, this water back extends the capacity of a kitchen boiler, and makes it a valuable heating auxiliary, especially in spring and fall, when the regular heating apparatus is too powerful.

☞Send for Pamphlet.



Spiral Water Back Attachment for Kitchen Ranges.

GLENMORE FOUNDRY AND MACHINE CO., 73d St. and WOODLAND AVE., PHILADELPHIA, PA.

SECURE AGENCY EARLY.

Send for Catalogue without delay.

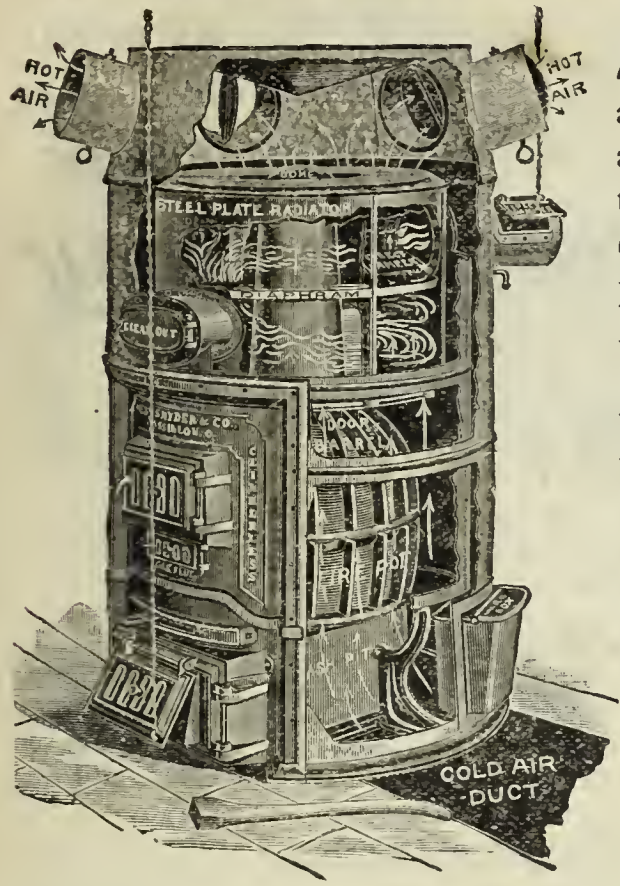
The Plummer Steam Heater.

12th SEASON, BUT "UP TO DATE."

The Leader Hot Water Heater

PUTNAM FOUNDRY & MACHINE CORPORATION, · **PUTNAM, CONN.**

A BOOMER and SURE DEATH.



THE BOOMER HOT AIR DRAFT is absolutely correct and will ***burn*** all the ***Smoke*** and ***Gases.*** The draft passes through a heated iron chute 1 in. high, 15 in wide and 6 in. long to reach the fire.

Double Return Flue Radiator insures ***Economy*** and is easily cleaned.

Especially adapted for either ***Soft*** or ***Hard Coal.*** Makes fully one-half less ashes than any other furnace. All Soot is burned. ***Heaviest, Most Durable*** and ***Economical*** Furnace made. "Don't be a clam," but investigate and learn the ***Real Merits*** of the ***Boomer*** before you order Furnaces.

The No. 16 Novelty Spray Pump

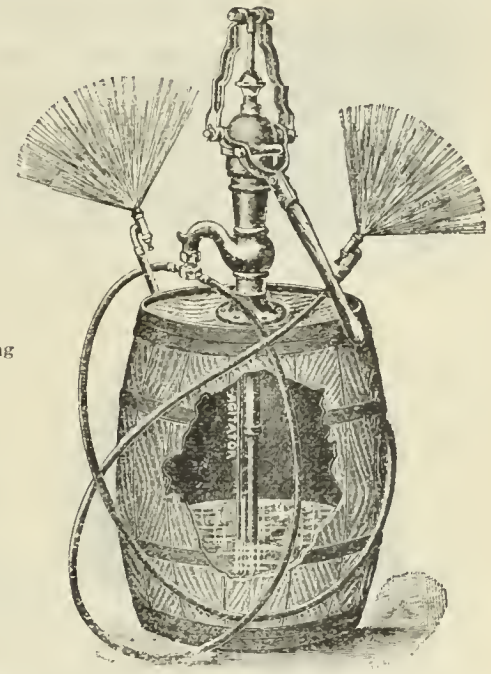
Is a Fatal Enemy to Bugs and Insects.

A perfectly steady stream is obtained, full 6½ inch stroke. Agitator pipe to bottom of tank insures constant stirring up of the solution being used. Life is too short to waste words selling a poor pump.

The Novelty will save you time and trouble and make a good profit for you.

The Only Perfect SPRAY PUMP Made.

Write for Complete Catalogue of Its Many Merits and Illustrating Full Line of Other Spray and Well Pumps.



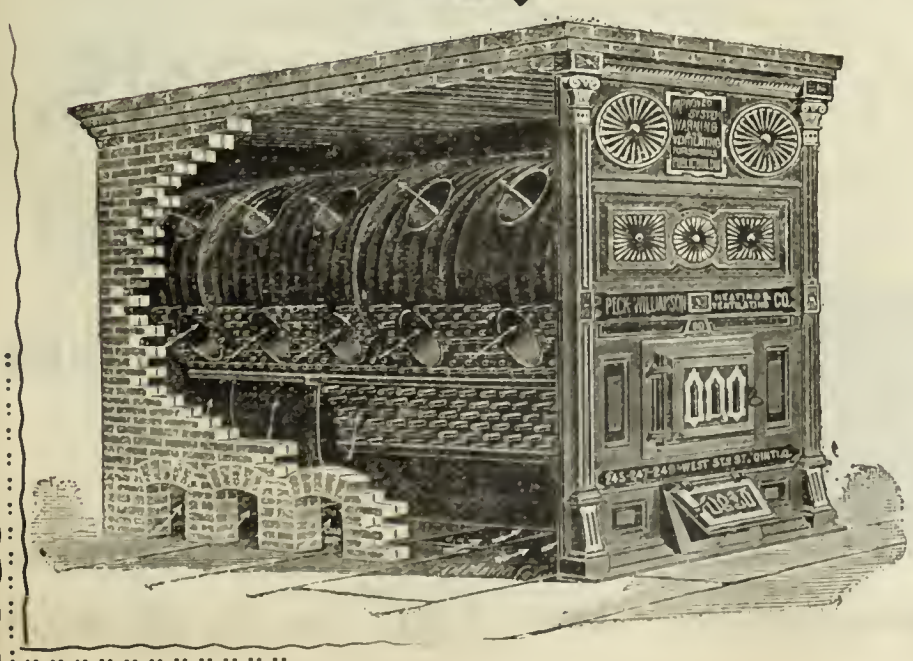
HESS, SNYDER & CO., Sole Makers, 73 ERIE ST., MASSILLON, O.

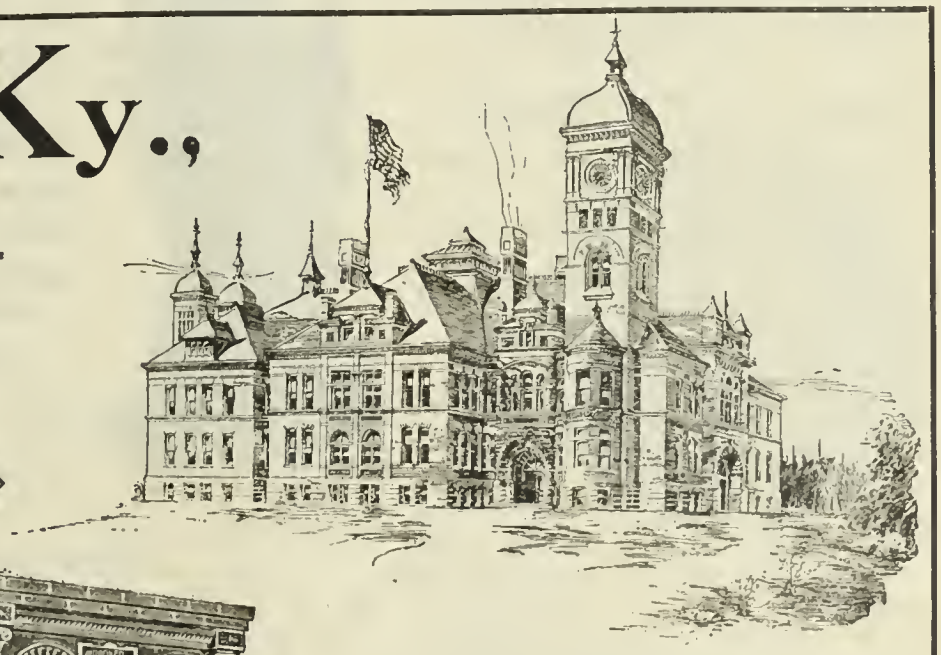
Ashland, Ky.,

HIGH SCHOOL.

Cost $50,000.

Heated by this





Hundreds of other Public and Private buildings are being satisfactorily heated and ventilated by our system. Note succeeding issues illustrating buildings that are being satisfactorily heated and ventilated by our systems.

The Peck-Williamson Heating & Ventilating Co.

Chicago—82 Washington St.
St. Louis—1206 Olive St.
Pittsburg—306 Wood St.
Webster City, Iowa.



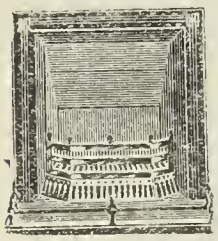
WE ARE PIONEERS in our line of Business.

Our customers get the benefit of our long experience. Our Celebrated Steam and Hot Water Heaters have stood the test of years, and they stand now where they always have stood—at the very *top* of the list!

WE DO NOT DO A RETAIL BUSINESS

American Boiler Company

94 Centre St., New York **84 Lake St., Chicago**



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.



THAT'S WHAT THEY SAID

"Cold snap? We hadn't noticed it particularly—kept warm enough at our house."

THEY WERE USERS OF THE

"Mowry-Page" Boiler,

This well satisfied lot of people. Many fitters were fortunate enough to have them among their customers—were **YOU?** Our new agency list is open for '95–'96: shall we put your name at the head of it? Experience must have shown you that it pays to please your trade, and we can help you do it.

Better have our catalogue by you anyway—it's a good investment and costs you nothing.

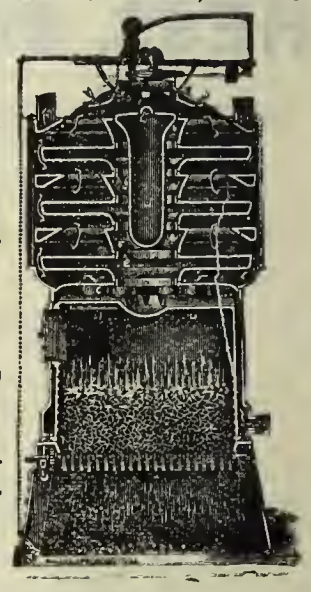
W. C. MOWRY, Lock Box 314, Norwich, Ct.

THE VOLUNTEER

STEAM



SECTIONAL VIEW, Hot Water.



For hot water or steam has no superior, and is the only hot water boiler that is **SELF REGULATING.**

Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

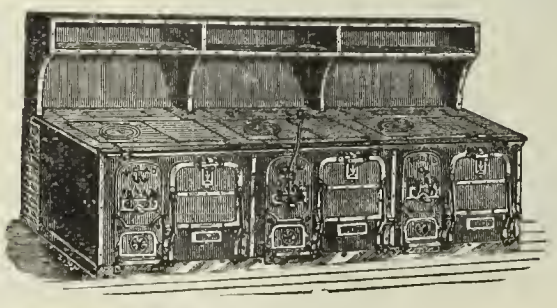
New York Agents, Dubois & Darrow, 61 Gold Street.

Established 1853.

V. CLAD & SONS,

117-119 South Eleventh Street,

PHILADELPHIA,



MANUFACTURERS OF

FRENCH RANGES, BROILERS

AND

Cooking Apparatus.

Catalogues and Price-Lists on Application.

— He Was Tired of Calendars —A long, lean, lank man, apparently laboring under some strong motive for excitement, stepped into a prominent insurance office on La Salle street this morning and asked:

"Do you give away calendars for 1895 here?"

"Yes sir," answered the agent.

"Are they printed with great big, black letters, with red letters for Sundays and little birds flying all over them?"

"Yes."

"Is there a string tied to them so they can be hung up in front of you?"

"Yes."

"Got plenty of them?"

"We have any quantity of them, sir. Want one?"

"Are there mottoes at the bottom telling you about watching out for fires, and where to get insured, and all that?"

"Certainly."

"How many companies do you represent?"

"Six or eight. There's the old relia——"

"Never mind. Do all of them send out calendars?"

"Yes, sir, all except one, but——"

"Do you mean to say that you have one company that doesn't send out calendars and doesn't intend to send out any for 1895?"

"Yes."

"Then," cried the lank, long, lean man, feverishly, "that's the one I'm looking for. I want to insure my life for $50,000 in that company. I've had 47 calendars for 1895 from 47 different companies stuck on my desk since the beginning of this week and the worm has turned, sir—the worm has turned."—*Chicago Dispatch.*

—Highly Plausible.—Lady: "I don't believe this recommendation is from your last mistress; how did it get all those grease spots on it?"

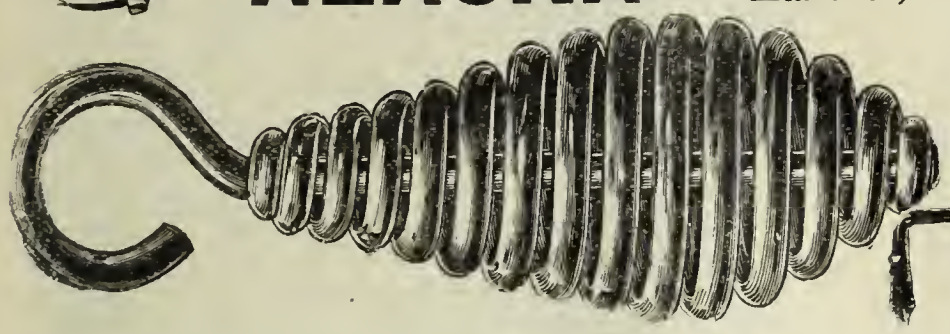
Applicant: "Sure, ma'am, thim is the marks of the tears she shed because she had to let me go."—*Indianapolis Journal.*



MADE UNDER THE GAITLEY PATENTS.

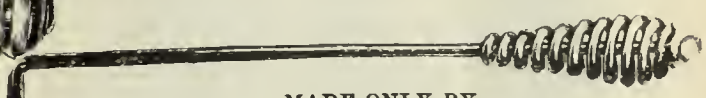


ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.



Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.



MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

BLUE BOOK
FOR THE
REGISTER TRADE.

A UNIQUE PUBLICATION FOR FREE DISTRIBUTION.

IF INTERESTED IN WARM AIR REGISTERS,
PLEASE WRITE FOR COPY TO

The Ferrosteel Company,
Wade Building,
Cleveland, - Ohio.



The Greatest Fuel Saver on Earth.

SUPERIOR STEEL RANGE CO.,

131-137 Viaduct and 35 W. Center,
CLEVELAND, O.

Do you want to sell the best working and best finished STEEL RANGE on the market?

If you do let us send you description of THE SUPERIOR and MARQUART RANGES.

We are now in our new factory and can fill all orders promptly.

WM. HIGHTON & SONS,
MANUFACTURERS
Registers, Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.

MICA
NORTH CAROLINA
WYOMING,
AMBER.
EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

NEW HAMPSHIRE
MICA
IS THE BEST

The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.

M I C A

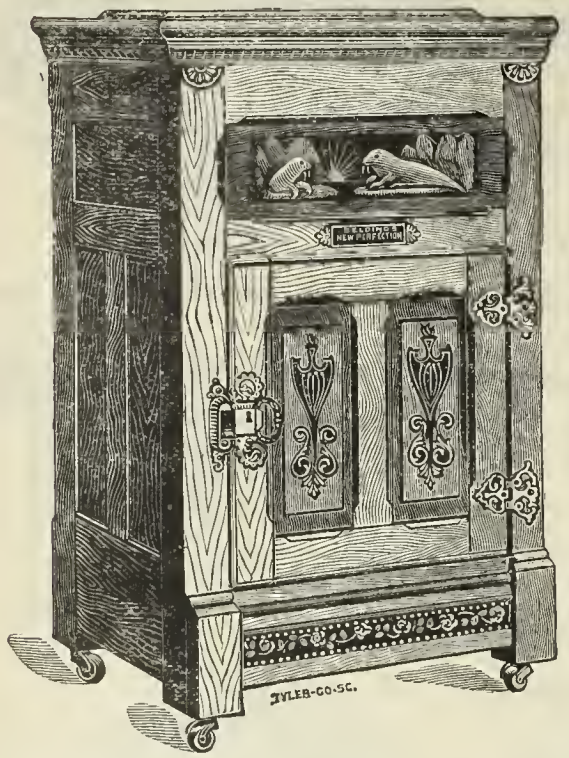
MICA OF ALL GRADES
—FOR—
STOVES and Mechanical Purposes.
PALERMO MICA CO.,
Miners and Importers and Wholesale Dealers,
S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.

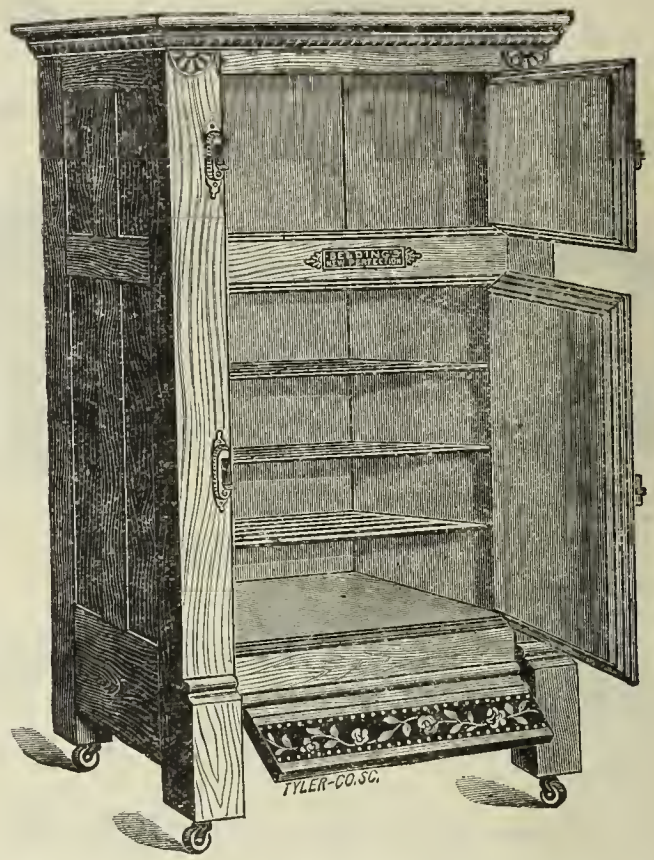
— DICK: "I wish we had a great big dictionary."

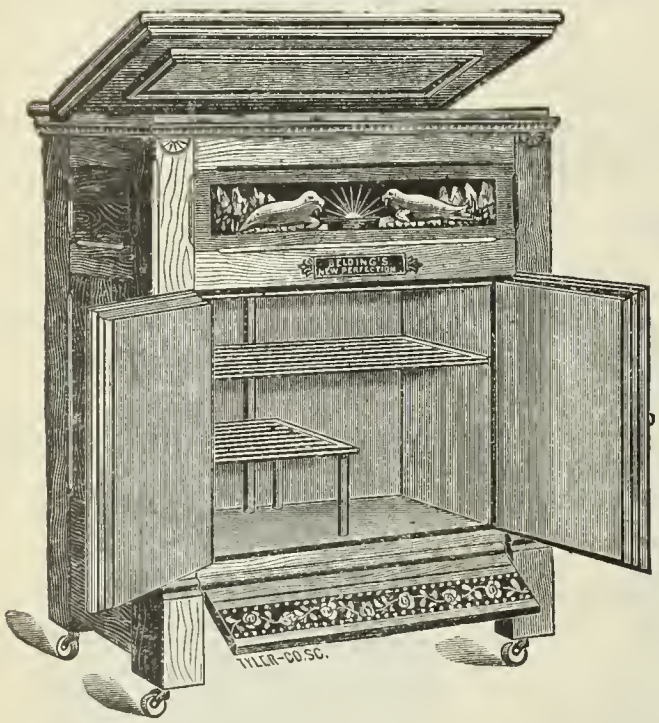
Tom: "Do you wsnt to look for sometiing?"

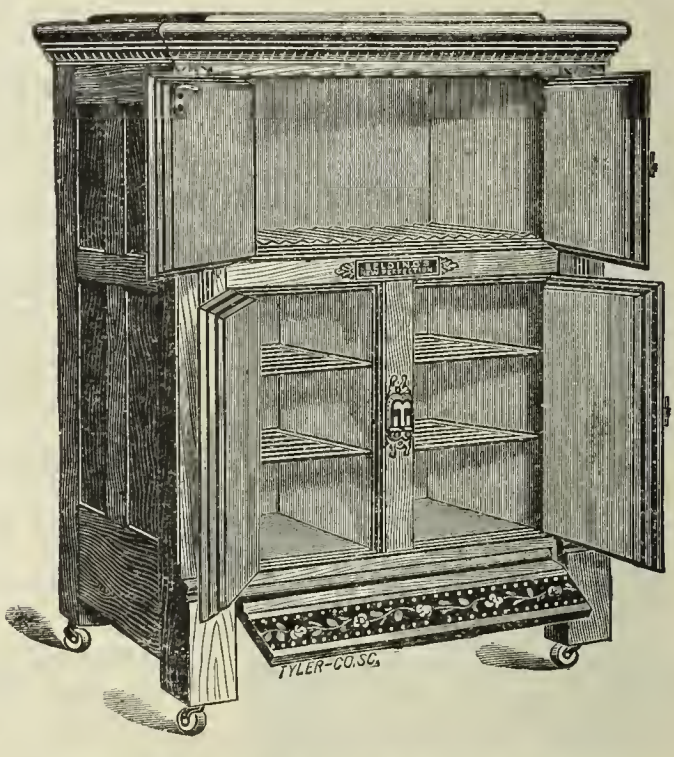
Dick: "Yep; the preserved cherries grandma put upon the shelf, that I can't reach standing on a chair."—*Chicago Inter Ocean.*

BELDING'S REFRIGERATORS.

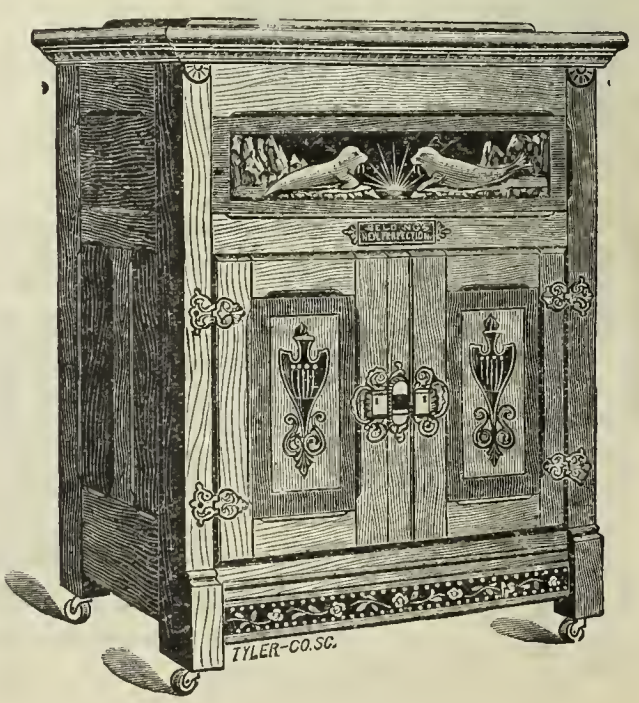




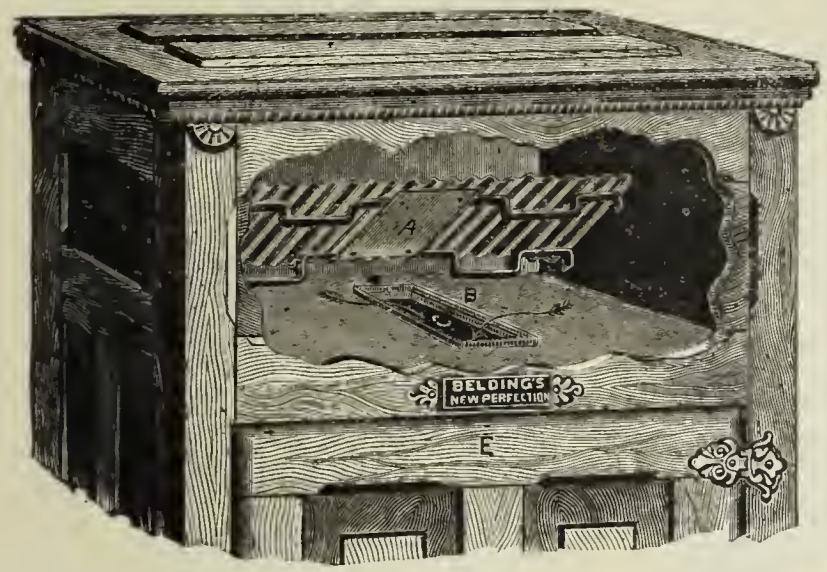




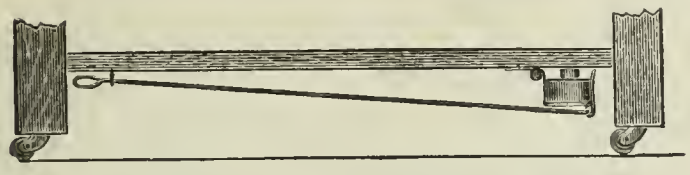


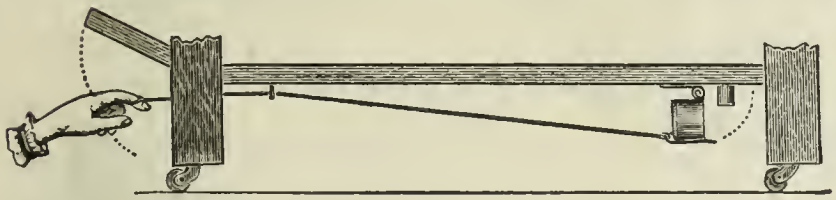


See Points of Excellence Over Others.



Patent Applied For.





OUR NEW AUTOMATIC COLD AIR DAMPER ATTACHMENTS.

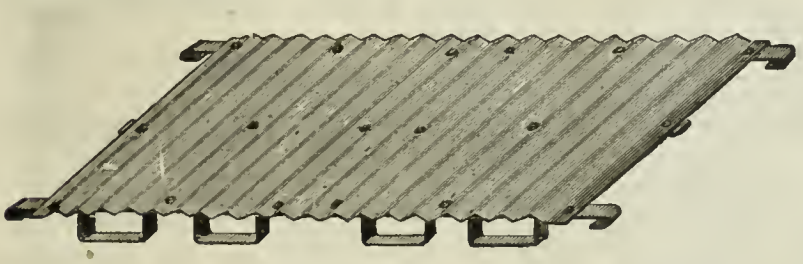
This cut shows a section of our Refrigerator with the New Automatic Cold Air Damper closed.

A—Represents Metal Ice Rack.
B—Bottom of Ice Compartment.
D—The **New Automatic Cold Air Damper.**
E—Door of Provision Chamber.

When the door of the Provision Chamber is opened the Cold Air Damper *immediately* closes the opening through which the cold air drops, thereby *instantly stopping the circulation* in the Refrigerator. Then, as the cold air in the Ice Compartment *cannot escape*, it is impossible for warm air to enter it through the flues in the sides of the Refrigerator; therefore, while the door of the Provision Chamber is open *no ice is wasted, no cold air escapes* and *no warm air enters* the Ice Compartment or *comes in contact with the ice.*

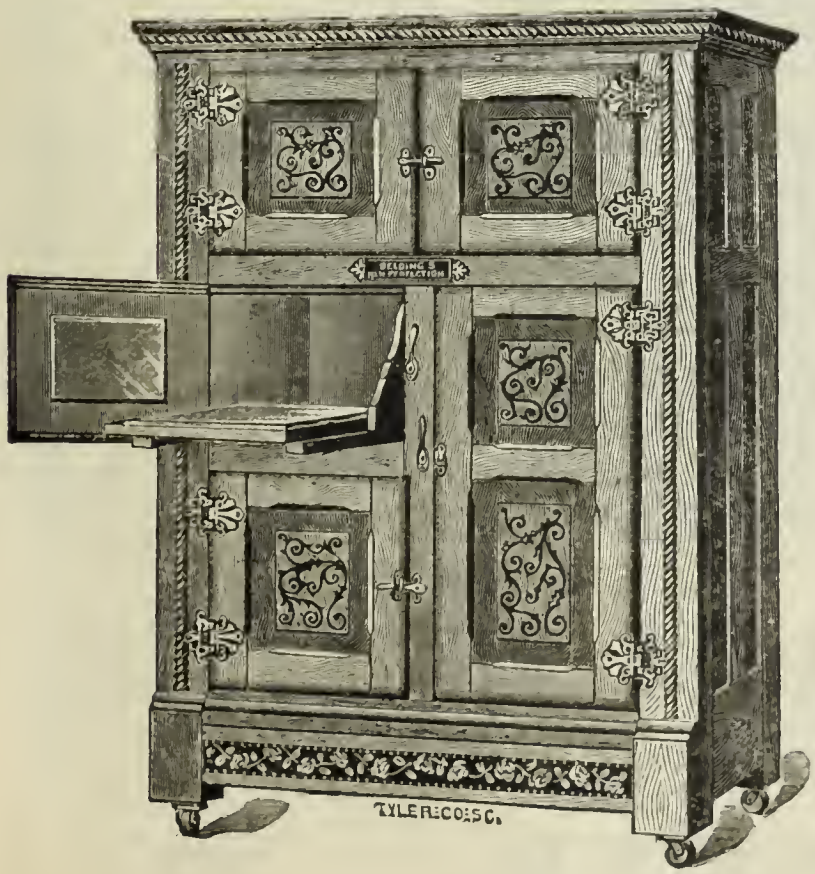
Thus it is clearly shown that this improvement is a *practical* one and makes our Refrigerators *consume less ice* than any that are now on the market.

OUR NEW DRIP CUP ATTACHMENT.



SOLID METAL ICE RACK.

No wood cleats to get water soaked and tainted.



All refrigerators **hardwood, antique finish.** We carry large stocks at all of the following places:

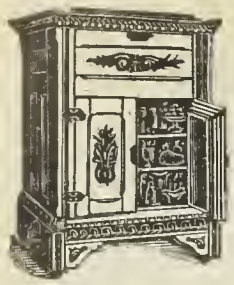
Belding Manufacturing Company.

Factories, Belding, Mich.

SALESROOMS AND WAREHOUSES:

Chicago, 223 5th Avenue.
New York, 260 Canal Street.
Philadelphia, 249 So. 2nd Street.
Boston, 90 Canal Street.
Holbrook, Merrill & Stetson, San Francisco and Sacramento, Cal., Pacific Coast Agents.

SEND FOR ILLUSTRATED CATALOGUE.



No. 21.

The Gurney Patent Refrigerator

is the BEST SELLER, gives the BEST SATISFACTION and PROFIT to the dealer of any refrigerator on the market BECAUSE—It has special FEATURES, "TALKING POINTS," SELLING POINTS, not found in other refrigerators.

1. By the use of a ***Removable Galvanized Ice Compartment*** the ***"Gurney"*** can be cleaned. This feature alone assures its sale.

2. Under the ***"Gurney"*** principles of construction the ***lowest*** average temperature is reached with the ***greatest economy of ice,*** as fully explained in our catalogue.

3. In the ***"Gurney"*** the ice does not come in contact with the zinc side walls, thus preventing condensation or "sweating" on the inside linings, an important feature of cleanliness and durability.

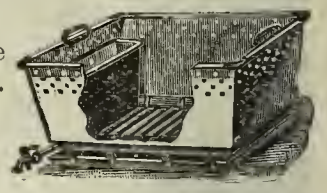
4. It is packed with Mineral Wool (the best non-conductor known).

5. It has the freest circulation and dryest air, there being a large space around the four side walls of the ice compartment, thus giving about six times the condensing surface of any refrigerator.

6. In style and finish it leads all competitors.

Send for Illustrated Catalogue and secure Agency.

GURNEY REFRIGERATOR CO., Fond du Lac, Wis.



Removable Galvanized Ice Compartment.

THE SHIRK REFRIGERATOR CO.,

CORK FILLED.

Manufacturers of

REFRIGERATORS

FOR

Families,

Hotels,

Restaurants

AND

Apartment Houses.

THE SHIRK REFRIGERATOR CO. TRADE MARK

Builders of

Cold Storage Houses

AND

COOLING ROOMS

Of Every Description.

273 WABASH AVENUE,

CHICAGO.

Branches { 30 Warren Street, NEW YORK. / 905 Market Street, PHILADELPHIA.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE

THE BEST IN THE WORLD!

OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

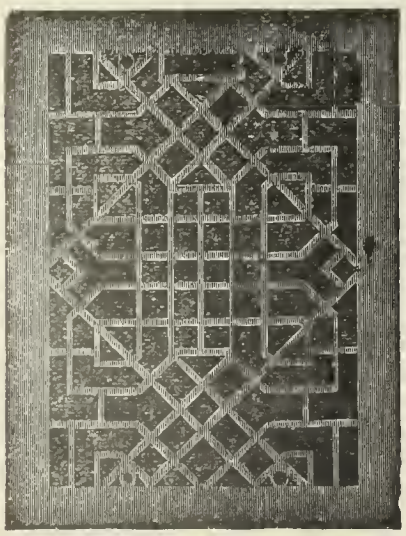
At LOWEST PRICES EVER KNOWN.

If your dealer does not have them, Send for Illustrated Circular and Price-List, to

JOS. W. WAYNE,

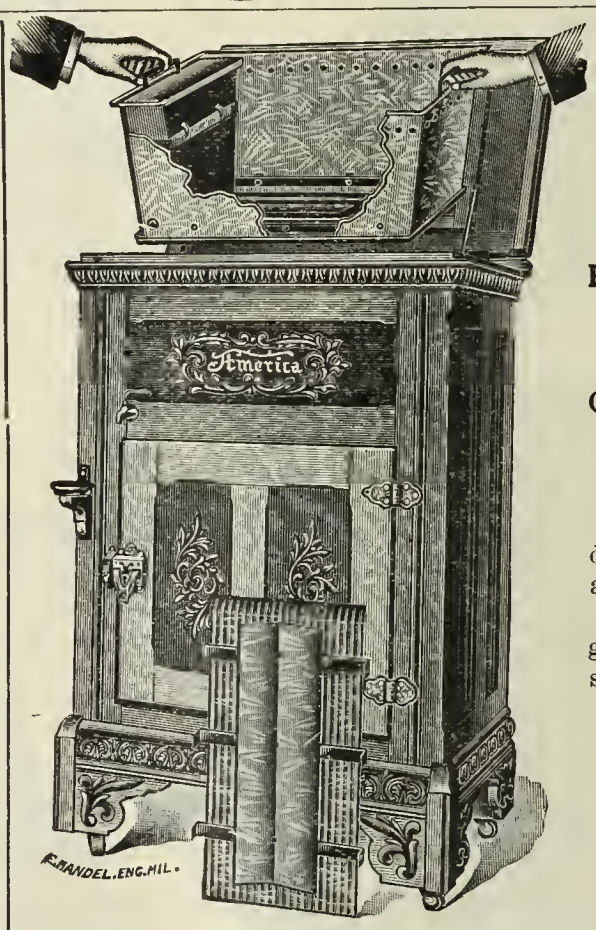
MANUFACTURER,

124 MAIN STREET, CINCINNATI, O.



Warm-Air Registers, Ventilators Etc. Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.



The America!

GEM OF

REFRIGERATORS.

Patented Removable Ice Compartment.

Can be kept clean with the least trouble.

Its construction for cleanliness, drainage of waste water, circulation and insulation is perfect.

Write for catalogue and investigate our claims. It will pay you to secure the agency in your town.

THE

Bowen Manufacturing Co.,

FOND DU LAC, WIS.

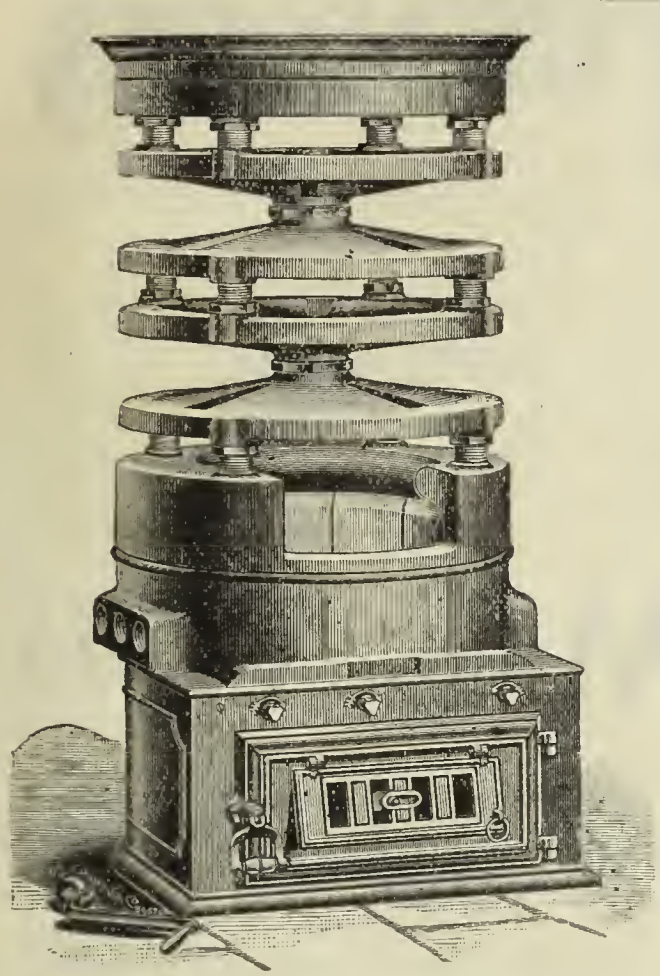
ORIGINAL

"BEAUTY OIL STOVES."

Central Draft, Double Roller Burners.

TROY OIL STOVE CO., - - Troy, N. Y.

Unparalleled HEATING Capacity.



CUT SHOWING BOILER SECTIONS.

56 Beekman Street, New York City.

A GLANCE at the cut reveals the secret of the wonderful heating power of the **Hub Hot Water Heater.** It has an overhanging shell firepot to begin with, which is a powerful boiler in itself. Over this are five annular sections with inclined surfaces, over which the water glides in an easy upward movement without check or friction. The circulation is from the sides to the center and back again, four times repeated through these sections.

The HUB is the simplest of all Heaters. There are no conflicting currents, no complicated parts, and an ordinary workman can put the parts together in half an hour.

The HUB has no long list of failures on its record. Every one sold is a reference for it. Steam Fitters, Architects and clients alike will find it an apparatus embodying the most desirable features known to heating science. Our pamphlet on Hot Water Heating fully describes its principles and construction and the results obtained. Write us for terms and territory.

The Smith & Anthony Co.,

MANUFACTURERS,

48 to 54 UNION STREET, BOSTON.

217 Lake Street, Chicago, Ill.

TUTTLE & BAILEY MFG. CO., New York, Chicago and Boston.

REGISTERS, VENTILATORS, &c.



RENAISSANCE DESIGN.

REGISTERS, VENTILATORS, &c.

THE ART OF SELLING.

By F. B. GODDARD. 12mo, Flexible Cloth, 50 Cents.

In this book the author lets the reader into the secrets of the accomplished and successful salesman, illustrates his tact and finesse, and tells how he masters men: but beyond this, the work embraces much information which will be instructive and useful to all classes of business men. Besides suggestions to buyers, it contains chapters on "Changes in Business Conditions and Methods." "Salesmen's Compensation." "Retail Merchants and Salesmen," "Saleswomen. "How to Read Character," with a collection of clearly and tersely put important Legal Principles and Decisions Governing Sales. Sent, post-paid, upon receipt of price, by

DAVID WILLIAMS, Publisher & Bookseller, 96-102 Reade St., N. Y.

Curious Artificial Fuels.

The Patent Office at Washington, says an exchange, has at present a very curious assortment of contrivances patented for cheapening the cost of fuel. Some of the ideas are exceedingly interesting. One patent provides for using corn cobs soaked in petroleum, another would have people cut leaves and grass when green and press them into compact blocks. It is claimed for this particular patent that such blocks might be used for building and fencing without impairing their value as fuel. There are, besides, many devices for utilizing coal dust. One proposes to mix clay, molasses and water, coal dust and petroleum. Another mixture is that of sawdust, Irish moss, asbestos fiber and burnt limestone, these being boiled and made into bricks with coal dust. Then there is a patent for bricks without coal dust, to be composed of ashes and sawdust saturated with petroleum and coated with rosin. Among the most curious ingredients for artificial fuels are clam shells, charred garbage, corn meal, wheat flour, sugar, seaweed, broken glass, lard, tar and leaves.

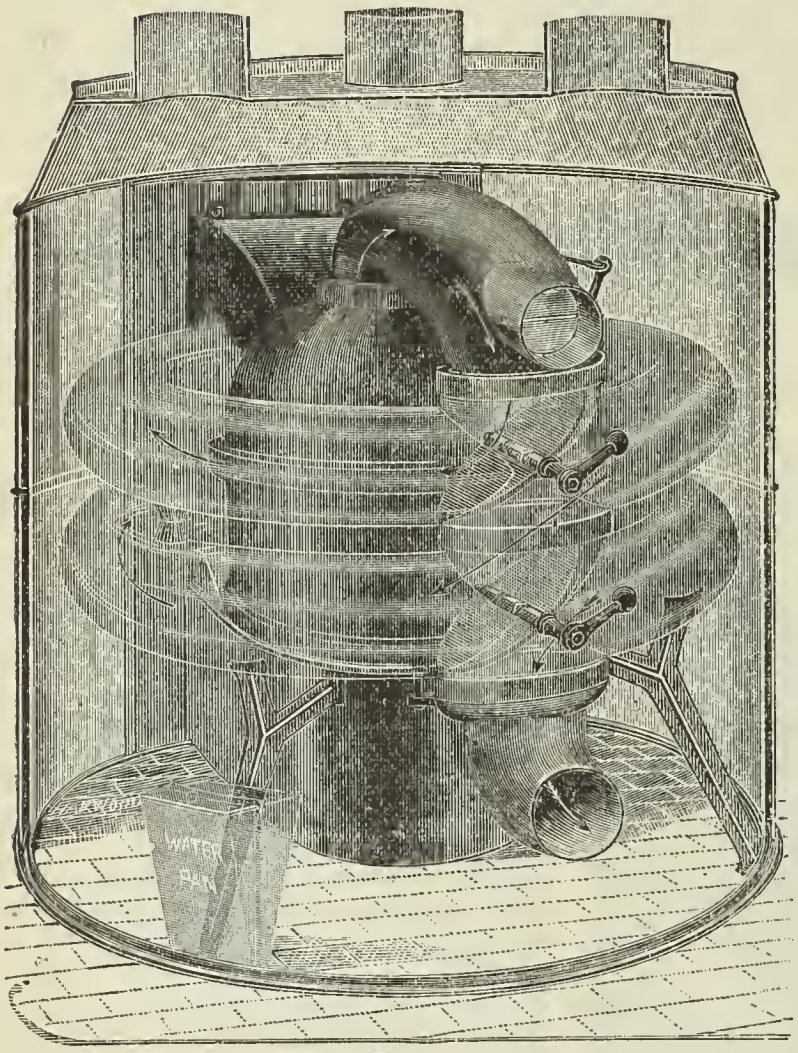
One of the most interesting of these contrivances is composed of powdered charcoal and finely cut cork. The fuel burns very slowly and gives off a great deal of heat, being particularly well adapted for the sick room. Exclusive rights have been taken out for the manufacture of a brick or cartridge of highly porous clay, which is to be soaked in kerosene and put in the kitchen stove when wanted. It is only necessary to touch a match to this and the fire is ready for cooking. None of these, however, are more ingenious or economical than a fuel which is reported to be in use at present in Egypt. In this case Egyptian mummies, chiefly those of cats, ibises and other animals held sacred by the ancients are employed.

HOWARD FURNACES

NEW YORK,
210 Water St.
BOSTON,
61 & 63 Blackstone St.

BRANCH OFFICES:

GRAND RAPIDS,
38 S. Division St.
TORONTO,
337 Yonge St.



Patented May 10, 1887.

MARK WELL

the course which the products of combustion take after leaving fire pot. The heat generated by the coal is made to pass down and around two cast iron radiators encircling the heater thereby utilizing the greatest amount of heat with the least amount of coal.

The Cold Air

introduced at base of furnace enters heating chamber at its coolest point and is gradually converted into warm air as it comes into contact with the heated surfaces.

Compact Arrangement

of radiators produces positive circulation, while the draft of overheated air is avoided, owing to large and ample warm air chamber and the heavy weight of radiator castings.

HOWARD FURNACE CO.,

SYRACUSE, N. Y.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 9, 1895.

DAVID WILLIAMS - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.. ..59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 10.
Index to Reading Matter.....Page 53.

Quality of Tin Roofs.

We commend to the attention of all of our readers who are interested in the subject of metal roofing a letter printed in our correspondence department of this issue from a firm signing themselves "Experience." The question touched upon is a vital one for the continuance of the tin roof trade. The inspiration of the communication was a letter we recently published in which occurred the statement that tin roofs could be put on at a profit at four cents per foot, and also that gravel roofs were largely used in the district in the South from where the letter was written. The communication to which we direct attention comments very seriously and earnestly on the present situation. The writers point out that it is no wonder that gravel roofs are being specified when the normal metal roof is a four cent a foot roof. At that price they say that only a waster can be used, and a waster furthermore of a very poor quality. We need not go over all the points of the letter, but we mention it here that attention may be directed to it. The argument of the whole communication is against the use of too cheap plates. The subject of acid made plates as against palm oil process ones is touched upon, and the sensible advice is given to the trade that the property owner should be educated to appreciate the value of a good roof and to demand it; that competition be not permitted to run on recklessly to the utter destruction of the trade in good plates, but that the house owner be taken into confidence and persuaded that his best interests are served by putting a little more money at the outset into the roof covering. We wish this subject might start correspondence from other persons in the trade, both dealers and roofers, for the benefit from such a discussion would inure to all concerned.

The Kitchen of the Future.

In the designing of buildings intended for living purposes one of the features which often fails to receive the attention its importance warrants is the kitchen. The idea seems to prevail in many quarters that this department of the household can be located almost anywhere without much regard to light, ventilation or convenience of access. It may be stated without fear of contradiction that in a majority of the flats and apartment buildings of the large cities of the country, and frequently in private houses as well, the kitchen occupies a damp basement or remote corner of the building, with little or no provision for ventilating the room of the vapors arising from cooking, and often so dark that it is necessary to keep the gas lighted during the day as well as at night. Under such conditions it is not surprising that the lives of cooks are short compared with those engaged in other indoor occupations. The many and serious objections urged against this condition of things in the course of time caused efforts to be made to remedy the difficulties. Some of the results are seen in connection with a few of the more expensive apartment houses, hotels and clubs, where the kitchen is located at the top of the building. In this position there is an abundance of light and ventilation, while the odors and vapors arising from cooking operations can be readily carried away, without annoying the occupants of the floors below. Ever since this plan was tried some little thought has been given to applying the feature to private houses. It is as yet in an experimental stage, but probably when electricity becomes more generally employed for domestic purposes, the kitchen at the top of the house will be regarded as common practice.

Sanitary Aspects.

Apropos of the above it is interesting to note that the Society of Cooks in Paris lately secured the services of an eminent physician to investigate the causes of the alarming mortality in their profession. He declares that the kitchens of Paris are the foulest portions of the houses, and that their occupants are subject to a multitude of disorders, which would be immensely reduced if the kitchens received a proper supervision on sanitary lines. One of the remedies proposed consists in increasing the size of the kitchen and removing from its vicinity larders, scullieries, sleeping rooms and water closets. A writer discussing the principles of kitchen sanitation states that "they can be applied to any house by a little study of material at hand. Oil cloth or linoleum should cover a wood floor, zinc or oil cloth should be placed over shelves and tables, and every vestige of carpet or rug relegated to some other place from that in which the food is prepared. Better, of course, than all this is to have put in new floors and walls of tiles or marble in the kitchen or pantry. Expenditure here would be of greater value than in the parlor if both could not be afforded."

Some American Kitchens

In marked contrast with the French kitchens, as well as some to be found in many German houses, are those of many of our modern American homes, where vaulted roofs, swell ends that take up the greater portion of the back yard, tiled or marble walls, inlaid floors, open plumbing and the latest features in ventilation make the word "kitchen" a poor term to apply to these places. In a beautiful mansion recently completed in this city the kitchen has a ceiling fully 15 feet in hight; the floor is inlaid with chips of marble, the walls are tiled and there is scarcely a strip of wood to be found outside of doors and frames of the china closets. Under a set of cupboards, which stand perhaps 3 feet from the floor and are 10 feet wide, the space is lined with marble and fitted with marble shelving. Every corner of the kitchen is light, the water pipes run outside the walls in stacks of six and eight lines and the nickel plated stop cocks are readily accessible at all times. In the butler's pantry adjoining are marble shelves, tiled wainscoting, inlaid floors and tables covered with zinc for draining dishes and keeping food while serving the table.

This is beyond question the era of mammoth department stores. Announcement is made of the completion of arrangements whereby the well-known Chicago dry goods firm of Siegel, Cooper & Co. will erect this summer in New York City a huge establishment of this kind uptown, which will be larger and more complete than any similar undertaking in the world, not excepting the Bon Marché in Paris and Whiteley's in London. The firm have purchased and acquired on long lease a property occupying one-half of an entire block on Sixth avenue, between Eighteenth and Nineteenth streets, the plot of ground having an area of 85,560 feet. The cost of the ground and buildings is estimated at not less than $4,000,000.

The passing out of existence of the Fifty-third Congress of the United States, on Monday, was contemplated with unfeigned satisfaction by the public at large.

THE LETTER BOX.

Cold Air Box and Filter.

From C. E. S., *Wheeling, W. Va.*—In perusing the columns of *The Metal Worker* the inexhaustible and probably seasonable question at the present time (the cold air box) bobs up serenely with curious antics. Our friend "J. L" of Pittsburgh in *The Metal Worker* of February 2 says, referring to his cold air duct, "if under the influence of some winds the hot air is inclined to be discharged out of the cold air box," &c. I would merely ask what causes some winds to come out of the cold air box? I think "J. L." has a very convenient duct, and if he wants to filter his air I think he can get good results by enlarging his duct from the bottom of the sash to the floor to about five times the original size arranged along the wall to suit convenience. He should then provide a series of three or four vertical slots provided with necessary guide strips. He should then make corresponding frames covered tightly with cheese cloth and insert them in the slots, thus closing up the cold air box. It is better to have a general door so that these can be taken out and dusted off about once a week or more as needed.

Why Did It Collapse?

From H. S B., *Oswego, N. Y.*—Will some of the readers of *The Metal Worker* state if they ever had a water boiler collapse? I have just had such an experience with a boiler made of copper that was considered first class. It occurred in the day time and was nearly full at the time. It assumed a shape resembling an hour glass. What was the cause of the collapse and the loud report?

Note.—We shall be glad to have our readers discuss this subject. The source of water supply not being known it is fair to assume that it is not very strong in pressure, as the boiler does not seem to have been reenforced to withstand either inward or outward pressure. Under such conditions heavy firing would generate steam to an extent that water would be forced out of the boiler back into the supply pipe. If the boiler became partly filled with steam and then the steam condensed instantly, a partial vacuum would result before water in sufficient quantity could enter to fill it. These conditions would bring a heavy pressure to bear on the outside of the boiler, which being made of light copper would collapse. Another cause that might effect the collapse in siphonage. If a faucet on the system below the boiler was opened when the supply was temporarily shut off it would draw the water from the boiler by siphonage if there was no hole at the top of the delivery tube in the boiler or it had become closed. Then as soon as the boiler was partly empty the pressure of the atmosphere of 14 pounds to the square inch on the boiler would cave it in. A safety valve which will permit steam to escape when a pressure stronger than the supply pressure was developed would overcome one trouble, and a vacuum valve that would open to let in air in case of siphonage would dispose of the other. Some correspondence on this subject will be found in *The Metal Worker* of February 10 and March 3, 1894. It is also treated in "Kitchen Boiler Connections."

A Few Remarks on Ventilating and Cold Air Supply for Hot Air Furnaces.

From M. I. C., Jr.—The ventilating system and cold air supply of the present time are about the only drawbacks that the manufacturers of furnaces have to contend with. How many furnaces are condemned on those very accounts. Where good results are not secured it is always laid to the poor working of the furnace, while, if the cause of the trouble was looked into by some one experienced, it would be found, in nine times out of ten, that it was in the poor ventilation of the building and the cold air supply to the furnace. How many times will we see a church or a private building where the furnace obtains the supply of cold air from the cellar or the floor above heating the same air over time after time until it becomes so foul in the room that a window or door is opened to let in fresh air. Some think that the furnace is being run too hard, which is not the case. It is the constant inhaling and exhaling of foul air and heating of the same air over and over again. In order to have a constant supply of both warm and fresh air we must take the cold air from outside the building and not from the damp cellars or from floors, where many of the impurities of the air settle. We must have ventilating flues built in the walls, and by placing openings into them as near the floor as possible provision is made for the foul air to escape, which will permit a constant supply of both warm and fresh air to enter. A building that is well ventilated is already half heated before starting a fire in the furnace. Why is it not just as necessary to have a system of ventilating and make provision for a supply of fresh cold air from outside the building as it is to have a system of plumbing?

Wants Cement for Marble and Basins.

From E. S. N., *Westminster, Md.*—Will some reader of *The Metal Worker* tell me of a good cement for joining marble and basins to marble slabs? I have used putty and several other materials mixed with oil, and they leave a dark oily mark on the marble. I have also used plaster of paris, which breaks out quickly and is of no value. I shall be glad to see a good cement given by some one who prizes The Letter Box.

Frozen Wind Mill Tanks.

From G. D. H., *New York.*—In answer to "W. A. F.," Matawan, N. J., whose letter appeared in *The Metal Worker* March 2. The exposed bottom sections of wooden tanks favor the loss of heat in freezing weather by their water soaked condition, which makes them good conductors, making their exposure nearly equal to iron tanks for liability to freeze in very cold weather. The freezing during very cold nights is also promoted by the disuse of water and its quiet condition in the tank and pipes. For a temporary expedient for preventing freezing the water should be allowed to waste slowly during very cold weather and the mill allowed to run to supply the waste. If the mill is a self regulating one, it will take care of itself with one bibb in the house partially open. The severest weather of the past season has been on windy nights, when wind mills will run strong and allow enough waste to prevent freezing in tank and pipes. This method is largely practiced in extremely cold weather for protecting exposed water pipes to the discomfort of water supply companies. As a permanent relief, the only safety is in protecting the tank and main pipes thoroughly, which can be done by a tight board ceiling under the tank bearing beams, filling the spaces between the tank bottom and ceiling with hay or other non-conducting material and closing up all outside openings beyond the line of the stoves and also by increasing the thickness of the covering on the pipe. For ordinary winters in this latitude, this should be sufficient protecting; for colder latitudes, the whole tank should be housed in, as is recommended for iron and steel tanks. All tanks should be covered with a wind tight roof.

Wants to Remove Letters from Glass.

From F. B. H., *Aberdeen, S. D.*—Will some reader of *The Metal Worker* inform me how to remove metal buttons from a plate glass window which have been cemented on with Stratena, without injury to the plate?

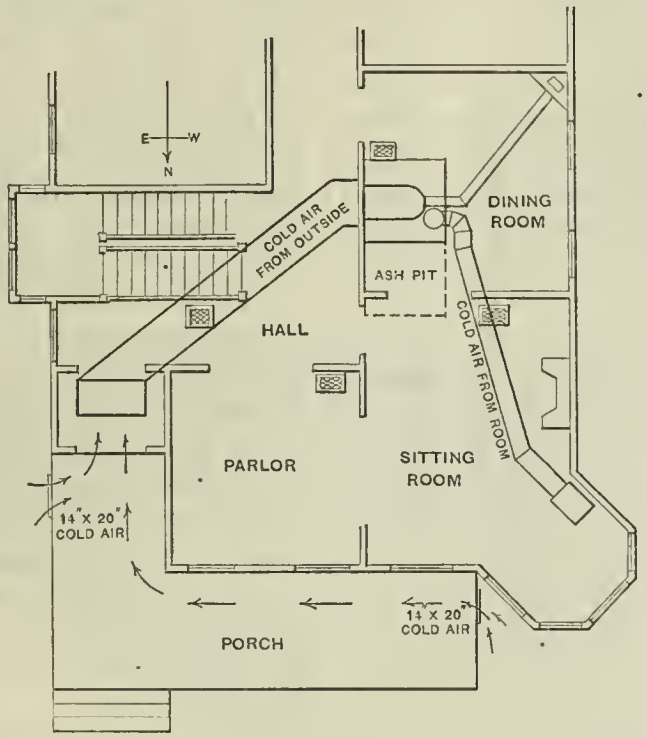
Heating From Range.

From H. L E., *Wahpeton, N. D.*—In *The Metal Worker* of February 23 I see a communication from "B. M. C.," Hoboken, N. J., in which he claims that a three-story house is heated from a range and small boiler. If he can give me the size of the boiler, position as respecting range and manner of placing coil, I will consider it a great favor. I am interested in any system of hot water heating which will give satisfactory and economical results. I am afraid his system would not give satisfaction during 40° below zero weather such as we have here.

Note.—We will be glad to illustrate and describe the system mentioned by "B. M. C.," and hope he will furnish the material.

A Peculiar Furnace Experience.

From C. S., *Cleveland, Ohio.*—We placed a furnace in a house in our city six years ago, and a furnace never worked better. This year the owner felt cold drafts in his sitting room at the floor. We informed him that we could draw the cold out of the room by putting a register in the floor and running a pipe from it to the furnace chamber. We did so, as shown in Fig. 1, which is a plan showing the sitting room and exhaust pipe. The pipe works the opposite of what we expected, however, and sends warm air into the room. The furnace has ten hot air pipes: two 12 inch, two 10-inch, three 9 inch and three 8-inch, all taken from the top, as shown in Fig. 2, which is a sectional view. The furnace is supplied with cold air by means of a duct leading from under a veranda, which has 14 x 20 inch openings at the east and west ends, and which has the floor laid with spaces between the boards for the admission of more air.



A Peculiar Furnace Experience.—Fig. 1.—*Showing Sitting Room and Cold Air Pipe*

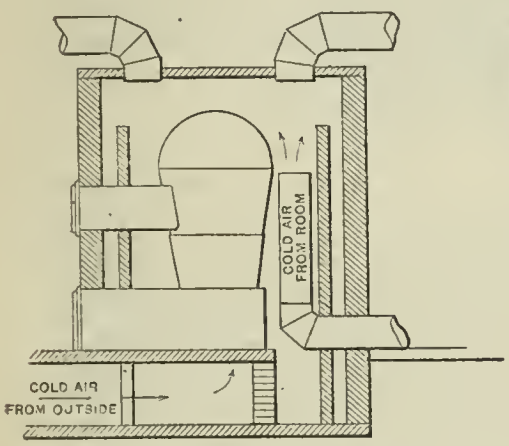


Fig. 2.—*Sectional View.*

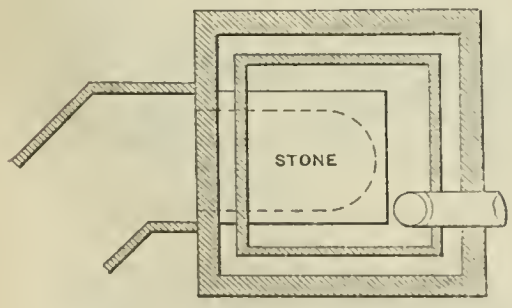


Fig. 3.—*Plan View of Furnace.*

The duct leads to a pit under the furnace, entering at the front under the ash pit, as shown in Fig. 3, which is a plan view. In using the furnace only three of the pipes are in use all of the time, two others are partly open and five of the pipes are scarcely ever used. One of the pipes that is not used leads to the first floor, all the others not used lead to the second floor. The room in which the trouble occurs is 14 x 19 feet, with a 10 foot 4 inch ceiling, and has a fire place in it. We placed a 14 x 20 inch register in the floor in the bay window, and ran a 14 inch pipe from it to the furnace, entering near the bottom and turning up 18 inches, but warm air came out of the register. We then added enough pipe inside of the furnace to bring the end up near the top of the chamber, with no better success. A section of the pipe was then taken off and a tapering piece, from 14 to 9 inches, was added, with a Globe ventilator on the top, but all of our experiments proved fruitless. The upright section of the pipe gets hot, and we cannot understand why the air in it does not rise. This is a very puzzling question to us, though it may be very easy to some of the readers of *The Metal Worker*, and we would be pleased to get their solutions of the problem.

Note.—This seems to be a perplexing problem, yet it is possible that some of our readers have met and solved it, and their method will be interesting to many. With a furnace having an area of 721 inches of hot air outlet it is fair to suppose that the cold air duct is of ample size, having an area of at least two-thirds of this amount, or about 480 inches, which will more than fill the pipes left open even before it expands. A cold air duct supplied as in this case would be less influenced by winds than is the general experience, so that the pressure of air on the furnace would tend to force hot air out of the exhaust pipe, as there is a fire place in the room in question through which a large amount of air could escape. It is possible for the air to pass down the short heating pipe in this room to the furnace and then air would readily flow in at the exhaust register. The pressure from the natural winds would be toward the heating register, and short circuiting as above described has been reported. By running the pipe up so high in the furnace it is easier for the hot air to enter it, though under ordinary conditions heating the pipe would aid in lifting the air. The exhaust pipe should not run along the cellar ceiling where it might become warm and hinder a down current of air. It should preferably have a down pitch from the register to the furnace, or drop down at once and run along the floor and enter the furnace low down. Often an exhaust pipe works better when the register is placed near or alongside of the heating register, when both registers may be located at some distance from the furnace if need be. We would suggest that the exhaust pipe inside of the furnace be removed and nothing left but the elbow. We shall be glad to have this case fully discussed.

A Roof Problem.

From C E S., *Wheeling, W. Va.*—I would like to see some discussion on the subject of roofing in reference to the possible leaks in double lock across seams. A contemplated improvement in a building here requires a new tin roof 40 x 120 feet. The owner complains about the many bills which he has paid in the past for repairing the cross seams on the present roof, which have been pulled apart parallel with the pitch of the roof. The roof is a standing seam roof, and he wants the difficulty above mentioned obviated in the new roof and objects to double locking on account of capillary attraction. He does not fear the leakage from such a seam so much as the breaking of the bend in the seams after it is once set, which will let in water to destroy the roof, which has not a very great pitch. I have suggested that the roof be constructed in sections of 20 feet each with one general pitch, each section having a vertical rise of 5 inches above the other, forming a series of steps. Then these offsets would compensate for the contractions. This suggestion has been ridiculed as impractical and I would like to have the subject discussed.

Will It Work?

From G. F. S, *Washington, D. C.*—In answer to the query of "F. L. M.," Roseville, N. J., in *The Metal Worker* of February 16, I would advise him to take a branch out of the top of the pipe from the water back to the boiler and put a stop cock between the branch and the boiler. Then run the branch up and over to the radiator, dropping down and connecting with it. An air valve must be placed at the highest point on the piping and a stop cock on the branch where it connects with the water back pipe. The return from the radiator should be run conveniently and connected with the pipe from the bottom of the boiler. By closing the stop

cock to the boiler and opening the other the circulation must go through the radiator. By reversing the manipulation of the cocks the boiler will be heated without heating the radiator. By opening both cocks a little both will be heated.

Arrangement of Hardware Store.

From GEORGE ROME & Co., *Carnegie, Pa.*—We send herewith a floor plan of a building we expect to fit up early in the summer and would be pleased to receive suggestions as to the best way of fitting this up for our own use. On account of the store being narrow we think of not using any counters, but using instead a wide counter shelf with a recess in the shelf for the scales. Our stock will consist of hardware, tinware, house furnishing goods, paints, stoves



Arrangement of Hardware Store.

and furnaces. We would also like to receive cuts and prices from manufacturers of screw and bolt cases.

The Quality of Tin Roofs.

From EXPERIENCE, *New York.*—Some two weeks since there appeared in your journal a letter from a Southern correspondent asking for information as to the lasting qualities of gravel roofs. He also went on to say that "where tin was formerly used in his section gravel roofs are now being specified;" and further makes an assertion that is somewhat remarkable, that "he can put on a good roof at 4 cents per square foot and make money out of it." Your correspondent's statement as to his using a quality of tin costing only 4 cents per square foot unfortunately exposes "the milk in the cocoanut," as any of your readers acquainted with the tin roof business would know (if they were aware of the location from which your correspondent writes) that it is an utter impossibility to buy even cheap prime plates, pay freight to destination and put them on the roof at the figure given by your correspondent. Indeed, to be able to make any profit at all (the quality of goods to which he refers has to be judged of course by the price which he states—4 cents per square foot, laid) he has to buy a plate either in Baltimore, New York City or Philadelphia that costs about $6 50 per box. Of course, it is needless to state that a plate at this price is a "waster" of the very poorest quality, and possibly containing holes over which paint itself would have no protective properties. Is it to be wondered at that with the use of such inferior and utterly disreputable material, gravel roofs—or any other kind of covering—would be substituted? Why is it that in the cities of Chicago, St. Louis and others, there are hardly any tin roofs? Your correspondent answers this question very satisfactorily himself when he makes a statement involving such a clear insight into just what class of material Southern cities have been afflicted with for such a long time. The citizens of St. Louis and Chicago have come to the same conclusion, and very wisely. It is simply the instinct of self preservation to obtain a covering that will at least shield them from the elements a reasonable length of time.

Being interested in the roofing business ourselves, we know that the use of inferior tin rests wholly with the property owner, the jobber and the consumer. There never has been a time when so many light weight and acid made plates have been used for roofing purposes as in the past four years. Competition has never been so severe and property owners never so reckless of their own interest as at present. The only cause we can assign for this is that they expect $1 worth of work and material for 60 cents. And besides, the price of roofing plates has been so materially reduced during the past few years by the introduction of what is known as the "acid flux process" that this class of material can be bought at a much less rate than any of the plates made by the palm oil process. If property owners could be taught to understand the difference in results between plates made by the acid process and plates made by the palm oil process they would be somewhat startled. Yet we do not think that out of every 100 boxes of tin plate sold to-day there are above three or four made by the palm oil process.

Years ago, competition among tin plate manufacturers centered itself on the quantity of coating that could be successfully placed on one sheet, which, by the way, was then put on by the palm oil process exclusively, acid being comparatively little known. Those who could show the heaviest coating were awarded the laurel. To-day everything is different. It does not so much depend on the amount of coating given a plate to determine its selling properties as on the price at which it can be profitably sold. We cannot blame property owners for using anything in preference to cheap tin—even gravel roofs. It is simply a matter of self defense. We do blame jobbers and roofers, however, for the present condition of affairs, and firmly believe that if the better class of roofers would only take the trouble to educate property owners to understand that but a fraction of a cent per square foot exists between a thoroughly reliable palm oil made plate and a plate made by the acid flux, they would appreciate the hint and act accordingly. It would have the tendency to at least lessen the fierce competition, while property owners would be willing to pay a little more for their tin when the result of its use could be clearly shown.

Of course, the fact that there are a great number of firms doing a large business who are placed in a false light by the present condition of affairs is fully appreciated, and although it may not at present be realized, there will be many of them in a few years like Othello, whose occupation will be gone. Again, do they stop to realize that this incessant warfare of prices simply means carrying on business for the fun of it? Sacrificing quality to price is suicidal, and generally ends in oblivion. We are sure *The Metal Worker* will bear us out in the assertion that not one firm can be pointed out—whether jobbers or roofers—who ever made a success in dealing exclusively in cheap and disreputable goods. It is in direct opposition to the law of natural worth. Yet we know for a fact that some of the old style plates nowadays which are supposed to be made by the palm oil process are made by acid flux in order to cheapen the cost of production and compete with the more reputable brands of palm oil manufactured plates, regardless of the welfare of the house, the roofer or the property owner.

In conclusion, we can only say that your correspondent has given the key to the whole situation, that until property owners are taught to understand that cheapness is not the first requirement (in roofing plates, at least), nothing but constant expense and new roofs will be the order of the day. And we will venture the prophecy that if acid plates are put on as recklessly in the next four years as they have been in the past, the cheap tin plate will be utterly abolished and a substitute introduced more favorably adapted to atmospheric action and the length of the buyer's purse.

Lining Slate Tank.

From E. S. W., *East Wallingford, Vt.*—One of my customers here has a slate tank, 26 inches square by 3 feet deep, which he uses for holding hot water. The expansion and contraction caused by the hot water becoming cool opens the joints, causing the tank to leak; consequently the owner wants the tank lined. Now, I would like to hear from *The Metal Worker* readers as to what material is best for the purpose. I want to use something that will wear well and stand the expansion and contraction without leaking. Would copper be better than zinc or galvanized iron?

Note.—It is probable that tinned copper will be the best, both for durability and cleanliness. The tank lining can be made outside of the tank and then put in. It should have a wire at the top, or a wood frame could be used, with the edge of the copper turned over and fastened to it with nails. We would be glad to have other suggestions from our readers.

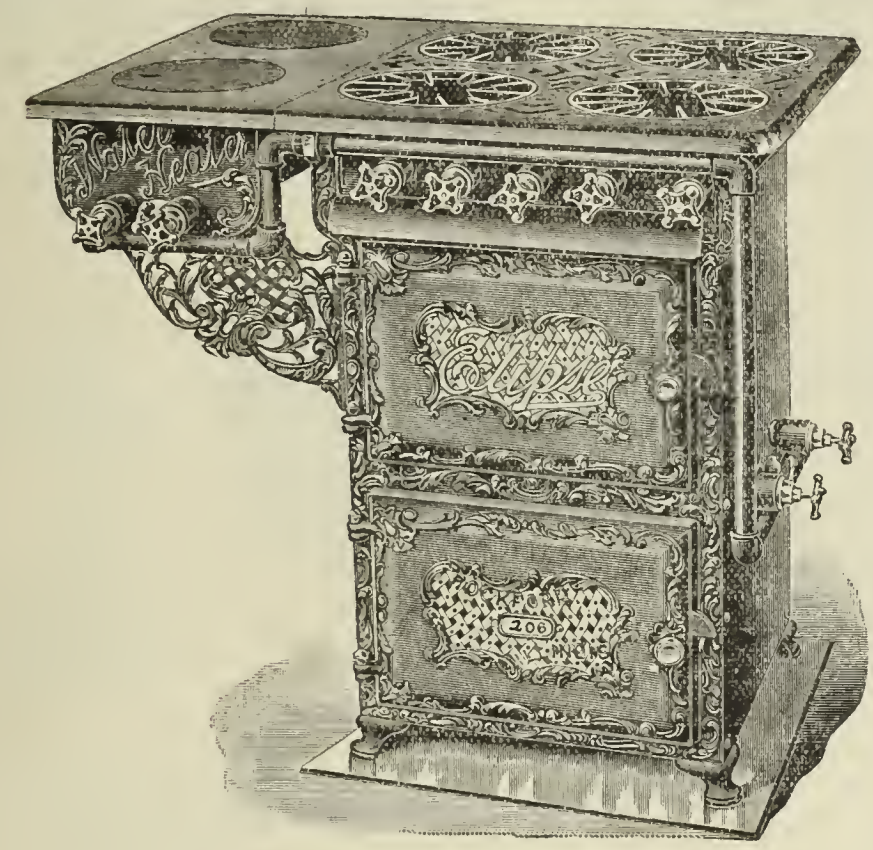
Rimmed Covers for Coffee Pots.

From J. G. F. W., *Indiana.*—I have lately found that we can buy rimmed covers for almost the same price as plain ones, and by changing the patterns of coffee pots and boilers we reduce the cost by cutting off about one-third of the work. If our brother tinners would do likewise they would be better able to compete with factory ware.

THE RETAIL STORE.

The Eclipse Gas Stove.

A new gas stove is herewith illustrated which has been brought out by the Eclipse Gas Stove Company, successor to the Van Wie Gas Stove Works of Rockford, Ill. This style of stove is made in two sizes, the larger with ovens 18 x 18 x 11 inches and top 23 x 27 inches, while the smaller has ovens 14½ x 14 x 10 inches and top 23 x 23 inches. The end shelf on each is 6 x 23 inches. They have a smooth open top, and the grates come flush with the top. Each size is made with three or four cooking holes, and a very neat water heater can be attached to any of the four different stoves, thus making eight styles. An important feature is that any three-burner stove can be changed to a four-burner after the stove is set up and connected. This change can be made without disconnecting or in any way disturbing the stove, so that consumers can increase the capacity of their stoves, and are not obliged to sell a good stove at a sacrifice when they desire a larger one. Linings will be put in with brass screws, so that the pieces can be easily taken out when repairing is necessary. The advantage of having no "rusting in" of screws is appreciated by those who have to repair gas stoves. The company's Standard mixer will be used on the top burners and also on ovens. The design of the stove has been copyrighted, it being entirely original, and the cut here presented is an excellent reproduction.



The Eclipse Gas Stove.

Covert Snaps.

Covert Mfg. Company, West Troy, N. Y., are introducing two new snaps, the Trojan and Jockey, as herewith shown. The Trojan snap is of the bolt variety, and is so constructed, it is stated, as to possess features of great merit. These are made with a loop, as shown, also with a round eye. The Jockey snap has a steel spring, and is particularly noticeable for its neatness of design and utility. This snap is also made with a round eye. Both snaps are made with ⅝ inch to 2-inch loops, and with ½ inch to ⅞ inch round eyes.

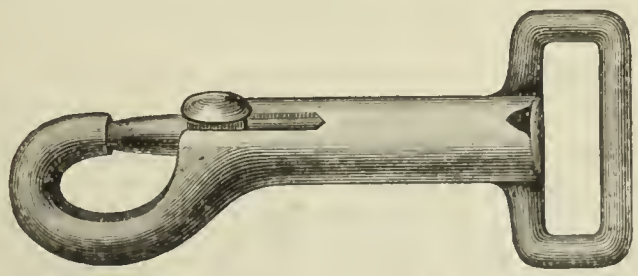


Fig. 1.—The Trojan Snap.

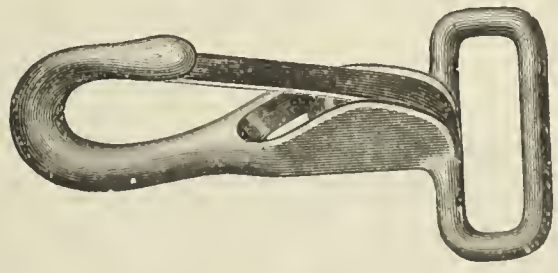


Fig. 2.—The Jockey Snap.

MEMORANDA.

THE FIRM of H. A. Tanner & Son, Aurora, Ill., have been succeeded by Henry R. Tanner.

J. R. RICH & SON, stoves and tinware, were recently burned out at Asheville, N. C. They were well insured and will continue in business.

THOMAS POLK of Jackson, Tenn., is reported as having sold his stoves, tinware and hardware business to Lawson, White & Co.

THE SHIRK REFRIGERATOR COMPANY, 273 Wabash avenue, Chicago, have opened branch offices at 30 Warren street, New York, and 905 Market street, Philadelphia. They have brought out some new features in refrigerators this season, which they believe will be appreciated by the trade.

JAMES A. NICHOLSON & Co., 116 South Calvert street, Baltimore, Md., as agent for H. S. Brewington, is offering two malleable iron household articles, one of which combines a stove lifter, ice pick, tack hammer and drawer, pan, kettle and pot lifter, screw driver and can opener. This article is furnished coppered and tinned, and measures 9½ inches in length. The other device measures 11 inches in length and combines ice pick, ice shaver and crusher, beef steak chopper and cutter, and is furnished coppered.

W. L. GOODRICH has severed his connection with the Chicago Stamping Company and now represents Sidney Shepard & Co. of Buffalo in Southern Michigan and Northern Indiana. Mr. Goodrich is a veteran in the Tinware trade. Prior to his engagement by the Chicago Stamping Company he spent a number of years with C. Sidney Shepard & Co. of Chicago. Few men are better known throughout the Western Hardware trade.

MATTISON, STEWART & Co. have taken store room and office accommodations at 69 Beekman street, New York, for the purpose of jobbing Hardware, House Furnishing Goods, Culinary Utensils and such desirable novelties or specialties as are being brought by manufacturers to their notice. They are business men of experience, fully acquainted with the trade, and have found it advisable to enlarge their business. They are traveling New England territory and portions of Pennsylvania, Ohio and Indiana, besides the metropolitan district in and about New York. They will include Garden Sets and Hose among other goods handled by them for some time.

STEAM AND HOT WATER.

Combination Heating.—IV.

BY J. W. HUGHES.

When a neat job was wished for and wall coils were used, they were screened by specially made base screens, as shown in Fig. 13. When set against the wall it was customary to first line the wall with a thickness of building paper, A. On this was placed a lining of sheet tin, B, the coils C setting close to but not touching the tin, a sufficient space being left for circulation of air around the pipes. Fig. 14 shows box coil, which could be fitted with the usual screen and marble top. In very small apartments, where every inch of room was of importance, the base coils or circulations were frequently let into the partition, as in Fig. 15, the tin and paper being fitted behind the coil, and the screen taking the place of the usual baseboard. Fig. 16 shows the wall coil or circulation commonly used, the return pipe being at either end, and each coil being fitted with air cock and spout for convenience of drawing off water. Figs. 17 and 18 show long circulation coils set with a pitch or fall. These coils give excellent results in all kinds of hot water heating, and are particularly adapted to apartments where space and appearance are not great objects. They are less liable to become air bound than the one illustrated in Fig. 16, which must at all times be set perfectly level.

Fig. 19 shows plan of a set of coils fitted up in the writer's house as an experiment. They have been working perfectly for the past 15 years. The main F is 1 inch and is not reduced in size, but is carried from one coil to another, dipping down under floors substantially as shown by the arrows. Great care was taken to prevent the formation of air pockets in any of the pipes under the floors. The coils, however, are not all in a row as shown, but are scattered about over a flat and are five in number. While not a desirable plan, "it do move" and has continued to do so for many years. Fig. 20 shows another plan, the pipes all being 1 inch. The water circulates in the direction of the arrows from C through A into coil F. Then by main F′ up and through coil G; from thence through riser H into header coil I and from top of one of the headers is taken the expansion tank. From one end of header coil the return J conveys the water into coil K, which winds around the partition, forming a coil to heat a room on each side, and from this through Z and coil M it returns to furnace through N, the arrangement of air cocks, feed, &c., being substantially as shown in the other plans. An arrangement of the kind shown in Fig. 20 calls for a powerful heater, and the circulation will, of necessity, be rapid. The objection to this plan is that coils M and K, &c., will not be as warm as F and G, &c., but by arranging to get the hotter coils in the colder or more exposed rooms this objection is not serious.

From what has been written the reader will be enabled to grasp the general principles and adapt them to his needs, and this is all that can be expected in any article on such a subject. It will be noticed that most of my allusions have been made to com-

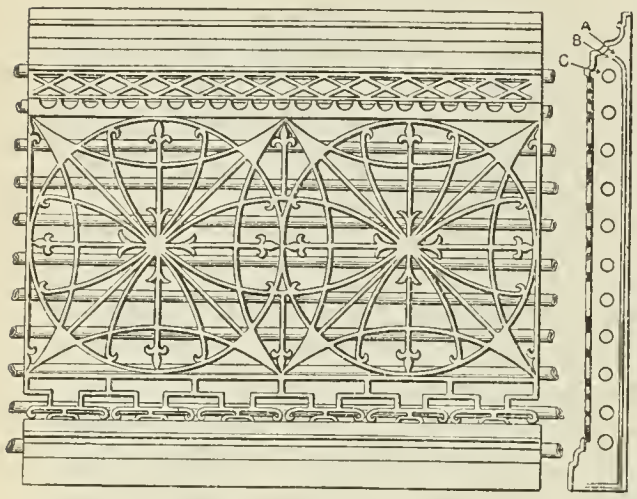


Fig. 13.—Base Screen for Wall Coil.

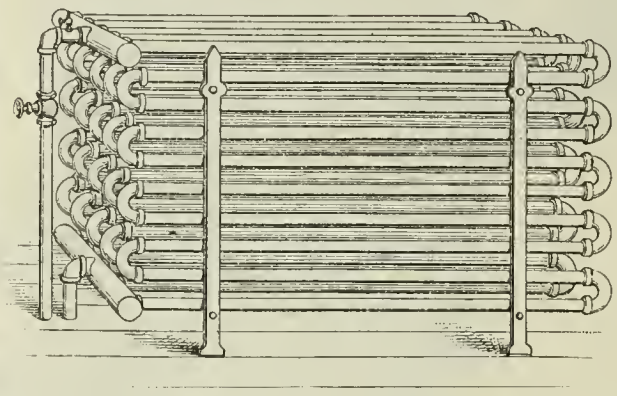


Fig. 14.—Box Coil.

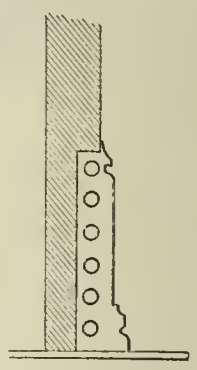


Fig. 15.—Coil Set in Partition.

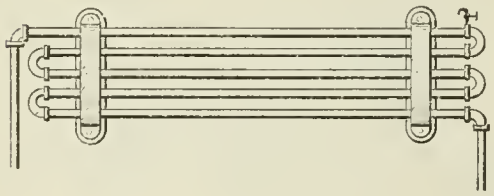


Fig. 16.—Ordinary Wall Coil.

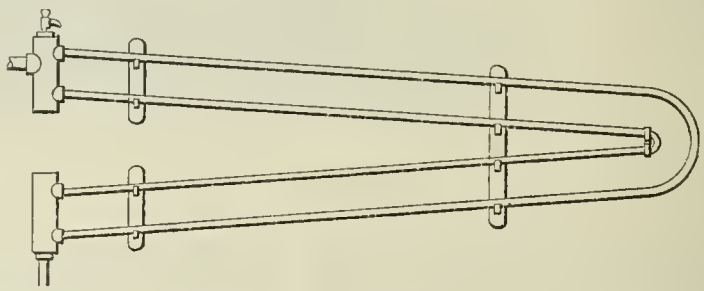


Fig. 18.—Long Circulation Coil.

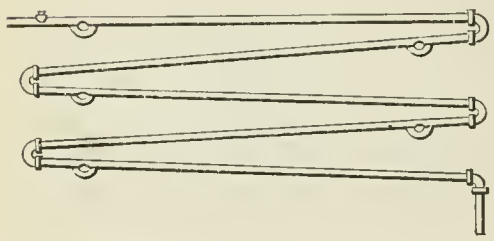


Fig. 17.—Long Circulation Coil.

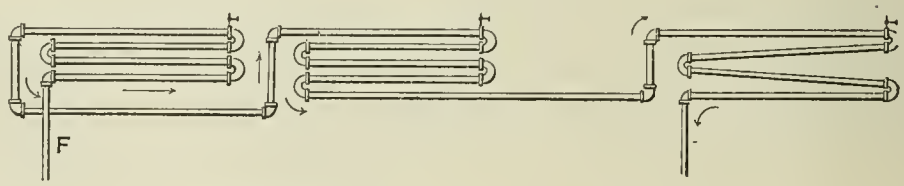


Fig. 19.—Experimental Set of Coils.

bination hot water heating in the past tense. This is because it is really a form of heating seldom used now in the city where this article is written (Montreal, Canada). The straight hot lower portion of the feed chamber was cut off, and in its place fitted a close spiral coil of ¾ pipe. From this main and return pipes were run to an upper story, where they supplied sufficient heat to successfully warm a lean-to conservatory 15 feet long and 10 feet wide by 9 feet at the highest point, giving excellent satisfaction to the amateur botanist who owned it. A good idea of this plant can be obtained from Fig. 21, were taken off, as shown, one going to supply hot water reservoir I, the other a radiator, H, situated on floor above. By manipulating the valve on radiator when hot water is wanted in great quantity in I, it can be obtained; at other times each gets its equal share. Sometimes trouble was experienced in getting the circulation from the heater coil in the furnace to work the right way—that is, it would "back up," and

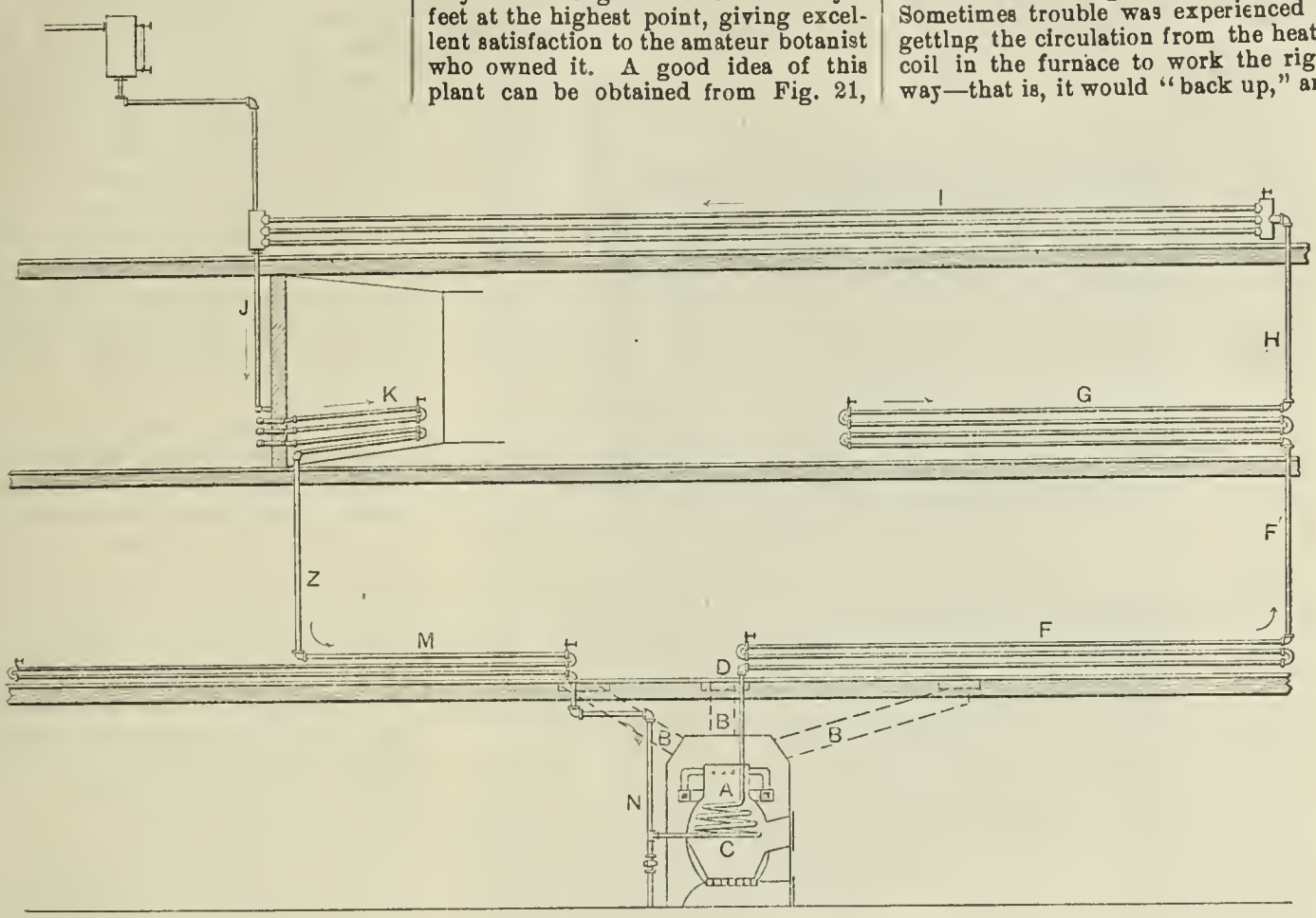


Fig. 20.—Pipe Arrangement for Powerful Heater.

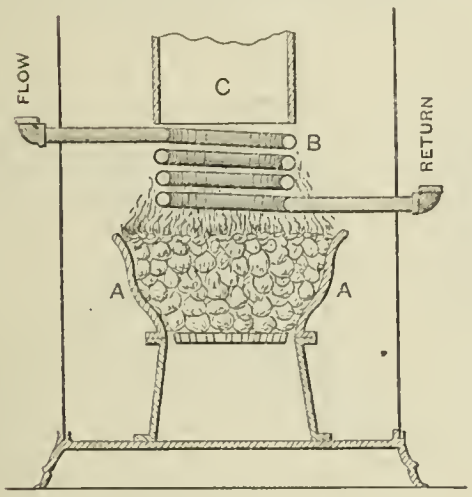


Fig. 21.—Coil Forming Feed Chamber.

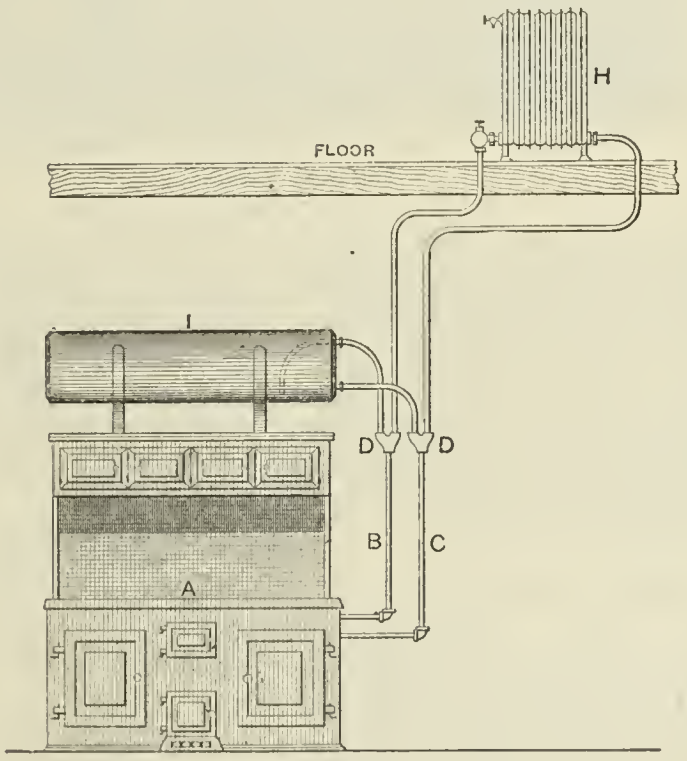


Fig. 22.—Heating Radiator from Water Back.

COMBINATION HEATING.

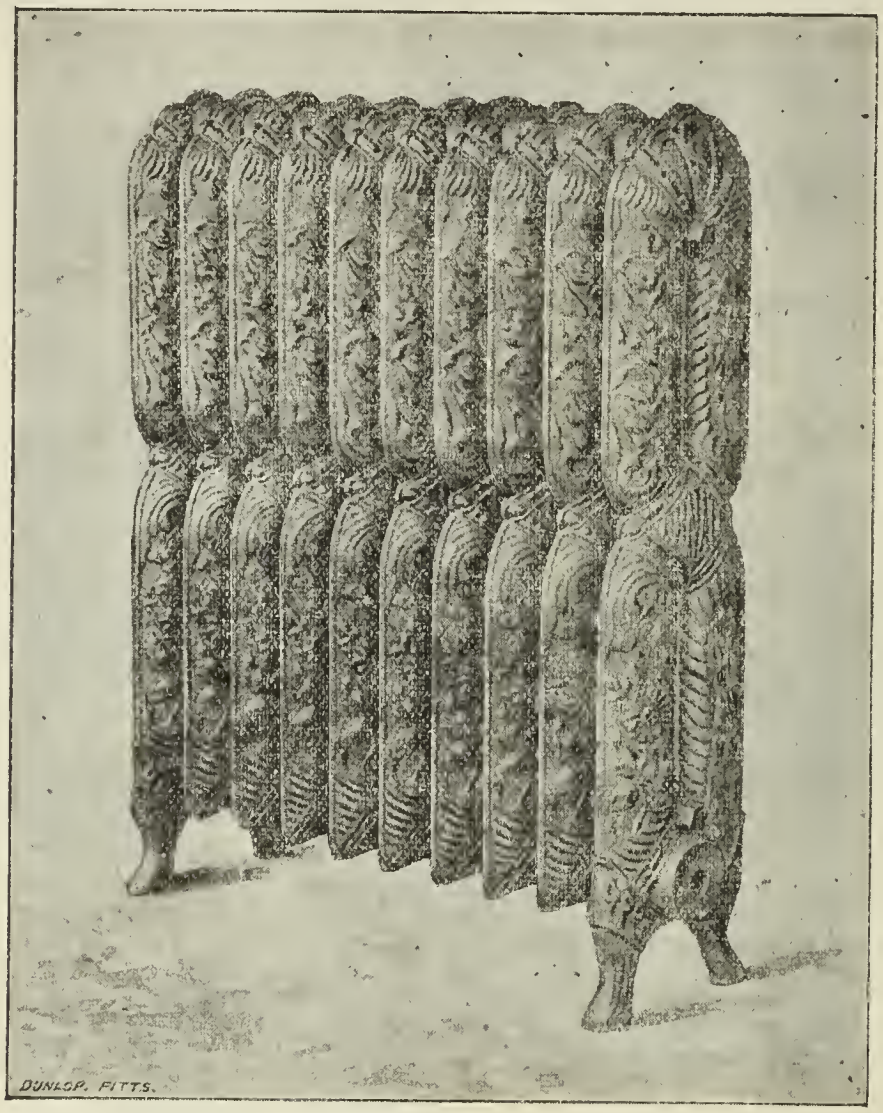
water apparatus has almost driven every other form of heating for domestic purposes from the field, but there is a good deal to be said in favor of the combination system, and it is undoubtedly worthy of the serious consideration of hot air furnacemen.

The principle has been applied in heating a small conservatory from an ordinary self-feeder hall stove. The A being fire pot; B coil replacing portion of feeder; C cut-off to receive coil.

Single coils and radiators to warm a room heated from the ordinary water back of a stove or range are common enough. One such recently fitted is shown in Fig. 22—A, range; B, 1-inch flow pipe from the heater; C, return; D, D, two 1 x ¾ inch Ys; ¾ inch branches fitted with bends (not elbows) the flow would be through the return pipe. A number of plans were tried to overcome this, the best being to make a dip or inverted siphon in the return pipe before it entered the furnace.

In filling the apparatus it is best to have all the air cocks open and fill very slowly. Cocks were specially made for this purpose, having only a ⅛-inch hole in the plug. As soon as

water began to run from air cocks they were closed uniil the apparatus was full, then reopened and a gallon or two of water drawn from each cock, or until such time as the water issuing showed no signs of containing air. When a coil refused to circulate, it was found an excellent plan to loosen the straps by which it was secured to wall, opening the air cock and letting water run into a large vessel, at the same time tilting the coil first up at one end, then at the other, until any air that had become jammed in the coil had escaped, which it would do in puffs. Of course, with coils having a pitch this kind of trouble did not occur. It is astonishing how little air will completely stop circulation. Fire slowly at first after coils are once started and there will be no more trouble.



The Ornate Radiator.

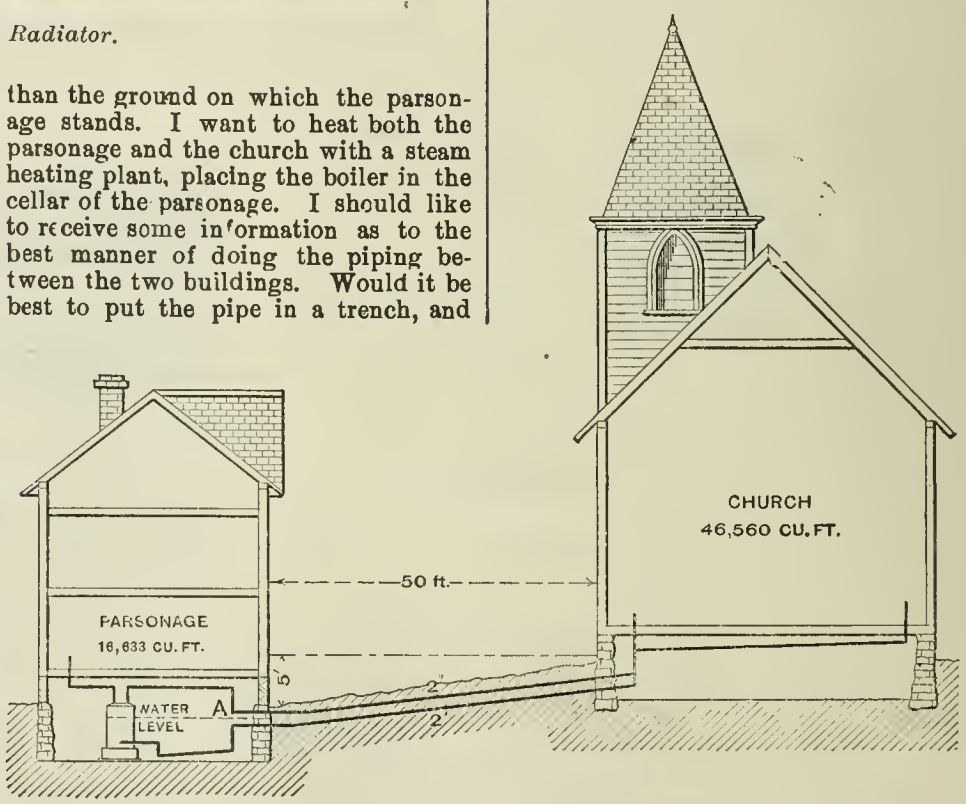
The Ornate Radiator.

The illustration presented herewith shows a new style of the Ornate radiator just put on the market by the United States Radiator Company, Saltsburg, Pa. The radiator shown represents the style in which the 32 inch hight is made. The central connection of the loops or columns has proven of advantage in hot water systems by securing a circulation of water when the radiator is not full. A feature of the ornamentation is the introduction of their trade-mark, bearing the word "Ornate" in the design.

WIRETON HEATING COMPANY have been incorporated at Chicago, with a capital stock of $50,000, for the purpose of manufacturing ventilating apparatus. The incorporators are Charles Loughbridge, David Williams, Allen L Fowler.

Problem for an Engineer.

From P. F., *Washington, N. J.*—There is a small church here containing about 46,550 cubic feet of space and a brick parsonage containing 16,663 cubic feet of space, located about 50 feet apart. The ground on which the church stands is about 5 feet higher than the ground on which the parsonage stands. I want to heat both the parsonage and the church with a steam heating plant, placing the boiler in the cellar of the parsonage. I should like to receive some information as to the best manner of doing the piping between the two buildings. Would it be best to put the pipe in a trench, and what size should the pipe be? I inclose a rough sketch of what I propose to do and would be pleased to have the subject criticised.



Problem for an Engineer.

Note.—A short time since we described the method of protecting a pipe that was run about 3 feet below the surface of the ground by a steam fitter in Springfield, Mass. A cast iron soil pipe was laid in perfect alignment between one residence and another and the joints carefully calked. This pipe was wrapped with asbestos paper to prevent the next wrapping of hair felt from overheating. The hair felt was then covered with oil paper and the trench filled in with cement around the pipe. In running the steam pipe it was suspended so that it did not come in contact with the sides of the cast iron pipe. A less expensive plan would be to use a wooden box around the pipe after it had been well wrapped. The size of the pipe will depend entirely on the amount of radiation that is to be placed in the church, and without more information than is given with the sketch it will be impossible to state what size would be best. The information that would be gained from consultation with a competent heating and ventilating engineer on this subject would be worth far more than the fee that would be charged. It would be necessary, however, to submit plans of both buildings that are to be heated to secure the best advice. Rules for computing radiation that have been tested are given in the "Essays on House Heating" taken from *The Metal Worker*.

A Pipe Fitting Question.

From W. H. P., *Washington, D. C.*—From the pipe fitting question in *The Metal Worker* of February 9 I would infer that several pipes are to be taken from the main pipe, if the sketch is correct. The explanation of the sketch would imply that only one outlet is to be used, but whichever is the correct solution the "bull head tee" would be preferable to a twin L or a Y, while either would be preferable for the return side. I find it more essential to secure an unobstructed return than some fitters think necessary. As many flow pipes may be taken from the main as desired.

The Nichols Tap and Reamer Wrench.

The cuts shown herewith represent a tap and reamer wrench, put on the market by the J. M. Carpenter Tap & Die Company, Pawtucket, R. I. In Fig. 2 the knurled sleeve is broken away, showing a right hand thread on the outside of the neck of the stock and a left hand thread on the handle. It is explained that the two threads are embraced by the corresponding interior threads of the sleeve; that a right hand turn of the sleeve closes the jaws while a left hand turn opens them, and that the handle moves in and out without any rotary motion, avoiding all tendency to unscrew while at work. The point is made that the large diameters on which the threads are enabled to be cut by this design allow the use of threads coarse enough to produce quick movements of the jaw, while the angle of the threads is so small that sufficient power is obtained by the hand alone so get a strong enough grip to prevent all loosening while at work. It is stated that no pin, wire, or other implement is needed to tighten its jaws upon the tap or reamer, the hand being sufficient to tighten the jaws; that the weakest point in similar wrenches is in this one greatly strengthened by the knurled sleeve, and that the wrench is of the best workmanship throughout, having hardened steel jaws and all parts interchangeable. The tool is made in five sizes, taking taps from 0 to 1¼ inches in diameter.



Fig. 1.—The Nichols Tap and Reamer Wrench.



Fig. 2.—Showing Working Parts of the Wrench.

Tests of Non-Conducting Pipe Coverings.

A series of tests have been made at the St. Louis Water Works by John A. Laird, to select the most suitable covering for pipes, boiler shells, &c., in the new pumping station at the Chain of Rocks. The report appears in the "Proceedings" of the Association of Engineering Societies. There were purchased asbestos sponge molded sectional covering, asbestos fire felt sectional covering and magnesia sectional covering, all for 1-inch pipe. Also, asbestos sponge cement felting, asbestos cement felting, plastic magnesia and fossil meal. Tests were also made on plaster of paris and sawdust, molded into covering for 1 inch pipe.

The different coverings were subjected to chemical examination by Mr. Wixford, chemist of the water works, with the following approximate results:

Asbestos Sponge, Molded.

Plaster of paris	95.8
Fibrous asbestos	4.2

Asbestos Fire Felt.

Asbestos	82
Carbonaceous matter not determined	18
Magnesia (Sectional).	
Magnesia	92.2
Fibrous asbestos	7.8
Magnesia (Plastic).	
Magnesium carbonate	93
Fibrous asbestos	7
Asbestos Cement Felting.	
(Probably) Powdered limestone	64.5
Plaster of paris	3.5
Asbestos	32
Asbestos Sponge Cement Felting.	
(Probably) Powdered limestone	59
Plaster of paris	10
Asbestos	31
Fossil Meal.	
Insoluble silicate	80
Carbonaceous matter, hair, paper, sawdust, &c	12
Soluble mineral matter	8

On all condensation tests the gauge pressure was held at 25 pounds. The water was drawn off every 15 minutes and was measured in cubic centimeters. Each test was continued for four hours. The mean results are tabulated below.

Condensation Tests.

Name of covering.	Ccm. Condensed per hour.
Magnesia (plastic)	334
Magnesia (sectional)	335.3
Asbestos fire felt	347.5
Asbestos sponge, molded	371.3
Fossil meal	376.2
Plaster of paris and sawdust	438
Asbestos fire felt cement	563.7
Asbestos sponge cement	604
Bare pipe	1085

On the question of durability Mr. Laird states that the magnesia sectional covering which has been on pipe at Bissell's Point for four years shows no signs of deterioration; also that the asbestos sponge molded covering which has been on pipes at Harlem Creek for less than two years is becoming soft, and the plaster of paris seems to be reduced back to the original powder, with nothing but the fibrous asbestos to hold it together. Another question is that of steam pressure. The experiments were made at the High Service Station, No. 2, and it was found convenient to have all tests made at 25 pounds gauge pressure. As the working pressure at Chain of Rocks will be at least 125 pounds, the relative efficiency of insulation will be slightly changed, but in Mr. Laird's opinion, not enough to change the conclusions here arrived at.

HEATING NOTES.

WALDRON MOORE, formerly connected with Eaton, Cole & Burnham Company, and now assistant manager of the New York branch of the Crane Company of Chicago, has recently paid the New England trade a visit.

THE BOILER used in heating the Baptist Church at Essex, Conn., has been ruined in a peculiar manner. During the recent cold snap the main pipe of the boiler was allowed to freeze. The water got out of the boiler, and the sexton of the church, not knowing of the condition of the boiler, started a fire. Then he went away to attend to some other duties, and when he returned the boiler was rendered useless.

THE J. H. MCLAIN COMPANY of Canton, Ohio, and 58 Dearborn street, Chicago, have issued a very handsome and artistic calendar, which runs from this month until March, 1896 It is a reproduction of a water color drawing by the well known artist Archie Gunn, and was made especially for the J. H. McLain Company. Mr. Gunn calls it "An American Girl Up to Date." It is a highly ornamental souvenir.

W. W. WARD will now talk the Royal line of heating apparatus, having been engaged by Manager Mackay of the New York house of Hart & Crouse, Utica, N. Y.

THE MODEL HEATING COMPANY, Philadelphia, are sending a postal card to the trade requesting them to "Wait a moment" before buying steam and hot water boilers until their 1895 catalogue is issued.

THE second of the series of lectures on steam and hot water heating presented under the auspices of the Chicago Steam Fitters' Protective Association will be given at Jefferson Hall, 70 Adams street, Monday evening, March 18. The subjects treated on will be combination heating, steam and hot water, steam heating as applied to large plants.

HARRIE D. CRANE of Cincinnati, Ohio, president of the National Association of Steam and Hot Water Fitters of the United States, attended the plumbers' convention at Columbus, Ohio, last week, and P. G. Munroe of New York, clerk of the association, attended the plumbers' convention, at Troy this week.

H. C. HODGES, president of the Detroit Lubricator Company, was in New York last week and left some samples of their new steam valves with W. A. Russell, their New York representative at 89 Centre street. The new valves are attractive in symmetry, having the circular appearance of the globe valve. The quick opening steam valve is ground flat and polished, with a monogram on three sides to distinguish it from the regular steam valve.

R. D. JACKSON, 89 Centre street, New York, is showing new cuts of the Electric steam and hot water boilers, which have had some slight changes made in the construction.

CHAS. F. HAUSS is assisted by J. W. Fryer in looking after the interests of

the Richmond Stove Company, New York. Mr. Hauss has an office in the showroom of Albert Cryer & Co., at 89 Centre street, where the Richmond Sectional and the Victor steam and hot water heaters are exhibited.

THE Association of House Heating Boiler Manufacturers had a meeting in New York on Thursday.

W. H. PFAHLER of the Abram Cox Stove Company, Philadelphia, made a visit to the heating trade on Centre street, New York, last week.

W. A. RUSSELL, 89 Centre street, New York, will represent the Model Heating Company, Philadelphia, in a large scope of territory. Mr. Russell says the Novelty line of steam and hot water boilers represents eight styles and 101 sizes with capacities for carrying from 100 to 3700 square feet of radiation.

A NUMBER of the delegates to the convention of the State Plumbers' Association at Columbus, Ohio, last week formed an organization to be an auxiliary to the National Association of Master Steam and Hot Water Fitters of the United States: President H D. Crane of Cincinnati was present and explained the objects of the association. The following officers were chosen: President, Charles Klie of Columbus; vice-president, W. D. Theobald, Canton; secretary, Frank Stratton, Columbus; treasurer, G. L. Saunners, Columbus; Executive Committee, John McVey, Lima; Herman Apple, Sandusky; Frank Love, Cincinnati; J. L Walker, Hamilton; G. W. Morgan, Cleveland, and J. V. Kraus, Akron. The newly formed association adjourned to meet next February in Cincinnati.

FRED. P. SMITH, consulting heating and ventilating engineer, Mohawk Building, 160 Fifth avenue, New York, has made the plans and is supervising the heating and ventilation of the new Proctor Theater on Fifty-eighth street, New York. Mr. Smith has the plans for similar work for several other large buildings and schools on the boards in his drafting room.

THE FIRM of Englehart & Krebs, 82 West Washington street, Chicago, have been dissolved, and a new company formed in their place, to be known as the Englehart & Stott Company. The officers of the new company are as follows: F. J. Englehart, president; D. M. Stott, formerly with the American Boiler Company, vice-president and treasurer; E. A. Smith, secretary. The company will retain their present location and do a general business in warm air, steam and hot water heating.

THE CARTON FURNACE COMPANY, Utica, N. Y., are about to issue a new catalogue showing a line of steam and hot water boilers. These boilers have been under test in residences before placing them on the market, and the catalogue is an evidence that the test has been satisfactory.

BEING desirous of increasing the sale of their product in Philadelphia and vicinity, the American Radiator Company have secured a commodious office and sample room at 506 Arch street, Philadelphia. The quarters are now being fitted up, and will be ready for occupancy by April 1. This branch will be under the supervision of the New York branch of the American Radiator Company, and the local manager will be Frank A. Brastow.

THE CALORIC CLUB, composed of manufacturers of house heating apparatus, had one of their enjoyable dinners on Wednesday evening at the Hotel Netherlands, New York.

New York State Steam Fitters.

Many of the delegates to the convention of plumbers at Troy, N. Y., remained to attend the meeting on Thursday to consider the proposition to form a State association of the Master Steam and Hot Water Fitters' Association. The meeting was held in the rooms 34 and 35, Hall Building. Representatives to the number of about 50 from all over the State attended. Among those in attendance were State Vice President F. A. Wells of New York, Past President Enoch Rutzler of New York, Secretary P. G. Monroe of New York and Jamas Curran and J. L. Wells, both of New York, of the National Executive Committee.

It was decided to form a State association. The organization was effected by electing the following · President, William M. Tobin; vice-president, John Creelman of Rochester; secretary, William F. Quinn of Troy; treasurer, P. C. Dougherty of Poughkeepsie; sergeant-at-arms, Charles Wills; Executive Committee, H. Patterson of Albany, James Conway of Jamestown, and T. L. Cusick of Kingston. The association will apply to the national association for admittance into that organization.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

BARRY & FELLOWS will erect at Forty-seventh street and Woodlawn avenue, Chicago, two $15,000 residences which will be heated by hot water.

E. W. PECK & Co., Derby, Conn., have a gang of plumbers and roofers at Seymour working on Dr. Benedict's new residence.

A COMMITTEE consisting of W. F. Nichols, H. E. McElwain and J. D. Hardy has been appointed by the Second Congregational Church Society of Holyoke, Mass., to look up a system of ventilation for the church and report at the next annual meeting.

JOHN M. PAGE & Co., Naugatuck, Conn., have received the contracts for heating and plumbing the new residences of L M. Tolles, George Craig, S. Gladding, Jr., and Geo. Merrill on Beecher Heights. The Victor hot water heater will be used.

SEALED PROPOSALS will be received by Chas. H. Jones, Toledo, Ohio, Auditor for Lucas County, up to 12 o'clock noon March 12, 1895, for the constructing and supplying of a steam heating, ventilation, power and hydraulic plant for the new Lucas County Court House. General plans and specifications prepared by David L. Stine, architect, are on file in the office of the Auditor of Lucas County, Ohio, and are to be considered a part of the invitation for bids.

THE LORD & BURNHAM COMPANY, Mohawk Building, 160 Fifth avenue, New York, are erecting greenhouses and installing the hot water heating plants, using their boilers, for Dr. Lucien Warner, Irvington, N. Y., R. B. Crane, Westfield, Mass., and H. A. Holcomb, New Bedford, Mass. They also have two notable contracts, one for a large conservatory for George Vanderbilt, at Biltmore, N. C., in which large horizontal tubular boilers will be used, the other for the New York Institute for the Instruction of the Deaf and Dumb, where floriculture and kitchen gardening will be taught the mutes. In this plant a National feed water heater is used for heating the water used in the radiation, steam for the heater being carried several hundred feet from the battery of boilers in use in the institution.

L. E. TURNER, Baldwinsville, Mass., is putting a Winchester steam heater in the residence of John Chisholm.

THOMAS J. O'MALLEY, 317 Wells street, Chicago, has the contract for the plumbing and drainage in the flat building of T. Sweeney, 1033 Sheffield avenue.

GEORGE FRANKLIN, 1343 West Ravenswood Park, Chicago, is to do the plumbing and drainage in the store building of W. J. Sanford, 1272 East Ravenswood Park.

WILLIAM BOWDEN, 238 Twenty-fifth street, Chicago, is to do the plumbing and drainage in the store and flat building of Frank Goedecke, 5008 and 5010 Cottage Grove avenue.

SMITH & DORNEY, 1046 North Western avenue, Chicago, have the contract for the plumbing and drainage in the flat building of J. L. Hawser, Richmond, near Chicago avenue.

THE HEATING of the birthplace of liberty, as Independence Hall, Philadelphia, is generally known, is to be changed. A modern steam heating plant is to be installed by the Model Heating Company, Philadelphia, who will use two of their double Novelty boilers and the Italian flue radiators of the American Radiator Company, New York.

LAWRENCE GRADY, New Haven, Conn., has the contract for the plumbing in Julia L. Gallagher's two-family house.

JOHN A. DODD, Middletown, Conn., is to erect a residence which will have a plumbing system and a hot water heating plant.

JOHN E. DARROW, New London, Conn., is to erect a fine residence in which the Hopson & Chapin Mfg. Company will install a hot water heating plant.

J. J. SULLIVAN, New Haven, Conn., has the plumbing contract for the new house of John Spargo.

E A. LETTNEY, West Haven, Conn., has the contract for the plumbing of the new house which C. E Humphrey is building on Water street, also one on Main street which W. H. Lettney is building.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until March 28, for work including the plumbing in the basement and first story of the United States Post Office Building at Aurora, Ill. Drawings and specifications may be had from the Supervising Architect at Washington or from the Superintendent at Aurora, Ill.

THE UNION FURNACE COMPANY, 65 Dearborn avenue, Chicago, are to install a combination heating system in the flat building of S. F. Whitehouse, 3957 and 3959 Ellis avenue.

ROOFING AND CORNICE.

Conductor Heads.—III.

BY CORNICE WORKER.

Patterns for an Octagonal Leader Head.

In Fig. 21 are shown the elevation, plan and patterns of an octagonal leader head. A B C D represents the front elevation, corresponding to E G H I J F of the plan, C D O of the elevation corresponding to the plan of the octagon leader shown by L M N O P R S obtained on the miter line N J draw lines parallel to J I cutting the miter line I O; likewise from the intersections on the miter line I O draw lines parallel to I H intersecting the miter line H P. As the front of the head D′ in plan is the same as E′ and C′, it will only be necessary to obtain the pattern for the front D′, which can be used for E′ and C′. As the side of the head A′ in plan is the same as the opposite side B′, it will only be necessary to obtain the pattern for A′, which can be used

For the pattern of the front proceed as follows: At right angles to H I of the plan draw the stretchcut line T U, as shown, upon which place the stretchout of the profile B D of the elevation, as shown by the small figures. At right angles to T U, and through the small figures, draw lines indefinitely, as shown, which intersect with lines of corresponding numbers drawn at right angles to H I from the intersections on the miter lines H P and O I. Lines traced through these intersections, as

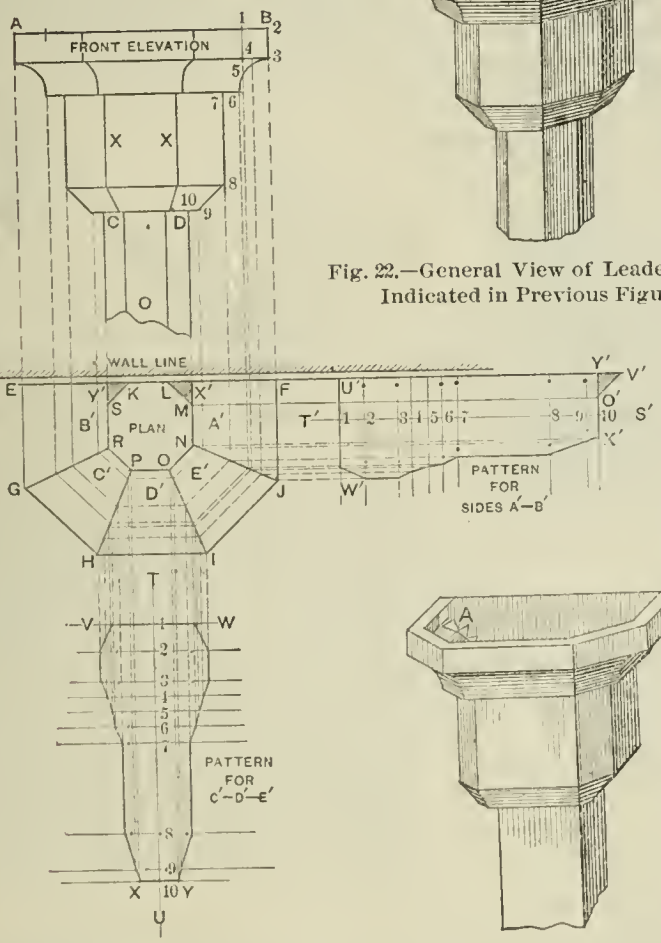


Fig. 21.—Elevation, Plan and Patterns for an Octagonal Leader Head.

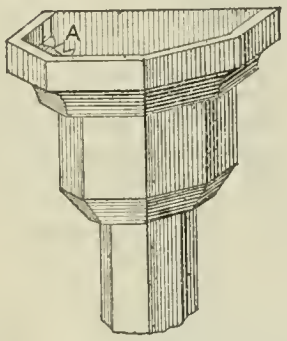


Fig. 22.—General View of Leader Head Indicated in Previous Figure.

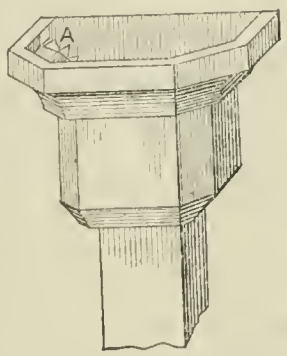


Fig. 24.—General View of Leader Head Indicated in Previous Figure.

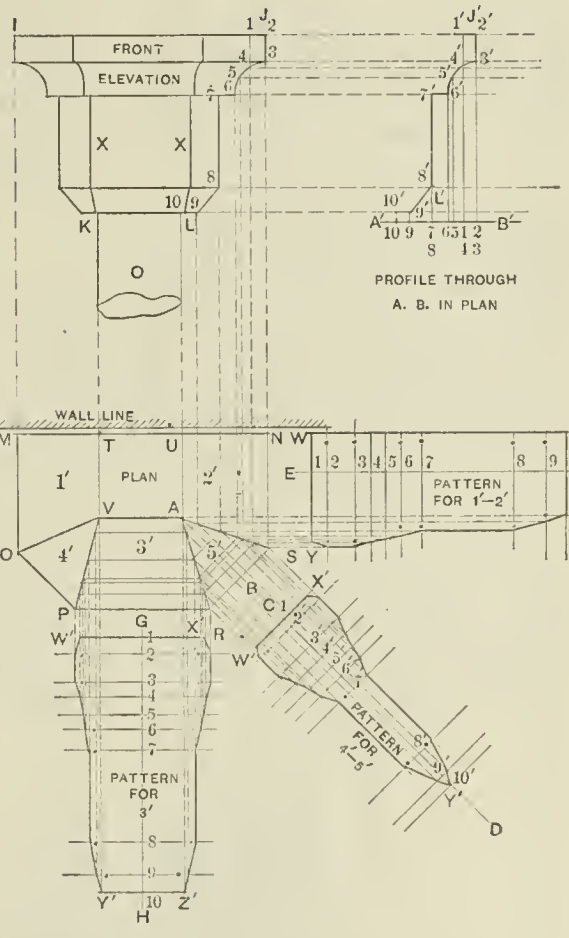


Fig. 23.—Elevation, Plan and Patterns for an Octagon Head Connecting with a Square Leader.

CONDUCTOR HEADS.—III.—PATTERNS FOR OCTAGONAL HEADS.

K. The dotted lines drawn from the plan to the elevation show their relation to each other. The two miter lines shown in elevation by X X are not necessary in the developement of the pattern. After the plans of the leader and head have been properly drawn, as shown in Fig. 21, connect the corners of the leader to the corners of the head by miter lines, as indicated by N J, I O, P H and G R. For the several patterns proceed as follows: Divide the curved portion of the profile B D of the front elevation into an equal number of parts, as indicated by the small figures.

From these, and at right angles to A B of the elevation, draw lines through the plan view cutting the miter line N J, as shown. From the intersections for B′, reversing it in forming. For the pattern for the side of the head shown by A′ in plan, draw a line at right angles to F J, as shown by T′ S′, upon which place the stretchcut of the profile B D of the front elevation, as shown by the small figures on the line T′ S′.

At right angles to T′ S′, and through the small figures, draw the usual measuring lines indefinitely, as shown, which intersect with lines of corresponding numbers drawn at right angles to F J from the intersections on the miter line J N. Now trace a line through the intersections as shown from W′ to X′. At right angles to F J extend the line E F of the plan indefinitely on to the pattern, as shown by the line U′ Y′. Then will W′ X′ Y′ U′ be the pattern required for the sides A′ and B′ in plan.

shown by V X and W Y, will be the required pattern for the sides E′, D′ and C′ of the plan.

In practice it would only be necessary to obtain the pattern for the side A′ in plan, because the angles J I H G are alike, thus making the miter cuts on all of the patterns the same. The following will illustrate how the front pattern is obtained by using the side pattern. Let W′ X′ Y′ U′ represent the pattern for the side A′, and let V W in the pattern of the front represent a straight line drawn on a sheet of metal. Now take the pattern of the side, and place W′ U′ upon the line V W on the metal and mark the miter cut V X. Now take the distance P O of the plan in the dividers, and place it as shown by X Y in the pattern. Now reverse

the pattern of the side and place the edge U′ W′ upon the line V W on the sheet of metal, making the corner X′ in the pattern of the side meet the corner Y previously obtained with the dividers, and draw the miter cut W Y, which completes the pattern. For the pattern for the flat piece forming the back, shown by E F, Fig. 21, place a sheet of metal of the required size under the front elevation and prick through with a scribe awl as much as is indicated by A B D C. If the leader head was put together and the octagon pipe joined to it there would be found two openings, indicated in the plan by the shaded lines X′ L M and K S Y′. To avoid this duplicate the triangle Y′ S K and place it on the pattern for sides. as indicated by the shaded lines Y′ V′ O′, which completes the entire set of patterns required for an octagonal leader head joining to an octagon leader. Fig. 22 shows a perspective view of the finished leader head, as seen from the front and top. A indicates the laps which are placed on the sides of the pattern and soldered water tight to the flat back.

Obtaining the patterns for a leader head forming the transition from a square leader to an octagon head :

In Fig. 23 are shown the elevation, plan and several patterns required to construct a leader head, forming a transition from a square leader to an octagon head. Let I J L K represent the front elevation, corresponding to M O P R S N of the plan, K L O of the elevation corresponding to the leader T U A V of the plan. The miter lines shown in the front elevation by X X are not necessary in the development of the patterns, but are only shown to give a front view of the article when finished. The dotted lines drawn from the elevation to the plan show their relationship to each other. After the plan of the leader and leader head have been properly drawn construct the miter lines in plan, as indicated by A S, A R, V P and V O. Now, divide the curved portion of the profile J L of the elevation into an equal number of parts, as shown by the small figures. From the small figures, and at right angles to I J of the elevation, draw lines through the plan view, intersecting the miter line A S, as shown. From the intersections obtained on the miter line A S draw lines parallel to S R, intersecting the miter line R A. Likewise from the intersections obtained on R A draw lines parallel to R P, intersecting the miter line V P, as shown. For the pattern for the side of the head shown by 2′ in plan, and which will also be the pattern for the side 1′, proceed as follows: At right angles to N S of the plan draw the line E F, as shown, upon which place the stretchout of the profile J L of the elevation, as indicated by the small figures on the stretchout line E F. At right angles to E F, and through the small figures, draw lines indefinitely, as shown, which intersect with lines of corresponding numbers drawn at right angles to N S from the intersections on the miter line A S. Trace a line through these intersections, as shown by Y Z. Extend the line M N of the plan upon the pattern, as shown by W X. Then will W Y Z X be the pattern for the sides shown in plan by 1′ and 2′.

For the pattern of the front shown in plan by 3′ proceed as follows: At right angles to P R of the plan draw the line G H, upon which place the stretchout of the profile J L of the elevation, as shown by the small figures, and draw the usual measuring lines, which intersect with lines of corresponding numbers drawn from the intersections on the miter lines V P and R A, at right angles to P R. A line traced through these intersections, as shown by W′ and Z′ X′, will be the required pattern for the front of head shown in plan view by 3′. As the angles N S A, A R P and R P V are the same, it is self evident that the miter cut for each of the angles will be alike, and in practice the pattern for the front could be obtained by using the pattern for the side, in the same manner as has been explained in connection with Fig. 21. Before obtaining the pattern forming the transition from the square to the octagon it will be necessary to obtain a profile through A B in plan, for which proceed as follows: At right angles to R S of the plan draw the line A B, cutting the corner A of the leader, as shown. As the distance A B, or the distance at right angles to R S, is less than the distance U N, or the distance at right angles to S N, a profile will have to be obtained through the line A B from which to obtain the stretchout in developing the pattern. As the hight of all points in this piece is the same, draw lines parallel to I J of the elevation, through the small figures in the profile J L, producing them indefinitely as shown. Transfer the intersections obtained on the line A B in plan to any horizontal line beneath the profile, to be constructed as shown by A′ B′. From the points on A′ B′ erect vertical lines intersecting lines of corresponding number previously drawn, as shown from J′ to L′.

For the pattern of the transition piece shown in plan by 5′ proceed as follows: At right angles to R S of the plan draw the line C D, as shown, upon which transfer each separate space from the profile J′ L′ upon the line C D, as shown by the small figures 1′, 2′, 3′, &c. At right angles to C D, and through the small figures, draw lines indefinitely, as shown, which intersect with lines of corresponding numbers drawn from the miter lines A R and S A at right angles to R S. Lines traced through these intersections, as shown by W′ Y′ and X′ Y′, will be the required pattern for the two transition pieces shown in plan view by 4′ and 5′. Laps can be allowed on the pattern for front and sides, thus avoiding laps on the transition pieces and on the flat back shown in plan by M N. For the pattern of the flat back indicated by M N in plan view, simply prick through the elevation I J L K, Fig. 23, direct upon the metal, which completes the entire patterns required. Fig. 24 shows a persective view of the leader head. The laps soldered against the back of the head are indicated at A.

The flanging of the square and octagon tubes as required is done upon the hatchet stake or by means of a flat plyers.

Forming the Head.

The same method is employed for forming the molding B D, shown in elevation in Fig. 21, as that described in connection with Fig. 20 in the last chapter. The bends 2 and 3 are made upon the hatchet stake and placed upon the former S, Fig. 20, in the position shown by X^1 A^2. Hold X^1 firmly against the former S and press down A^2. which will form the cove shown by X^1 B^2. The following sharp bends, shown in the profile B D in Fig. 21 by 6, 7, 8, 9 and 10, are made upon the hatchet stake by means of a mallet.

Soldering the Head Together.

After the heads have been accurately formed to their respective profiles the laps are bent off with flat pliers, square or octagon, according to the plan of the head. Cut a small octagon bevel from heavy sheet iron, to be used in tacking the parts together. Tack with solder the various parts, beginning with the front and ending with the back. Now look down over the members of the molding so as to see if they are accurately placed with regard to one another and that the head is not lopsided. Then solder water tight and put in the pipe last.

There is always a risk in using the bevel that it may be moved in some way or other, thereby changing the angle, and if not seen in time often causing the work which was done with the bevel to be taken apart. To avoid this, any old piece of metal can be placed under the angle required and pricked through upon the metal and cut out with the shears; the angle will then be stationary and no risk will be taken.

Folsom's New Model Roof Snow Guard.

In Fig. 1 of the accompanying cuts is shown a new model roof snow guard offered by the Folsom Snow Guard Company, 33 Lincoln street, Boston,

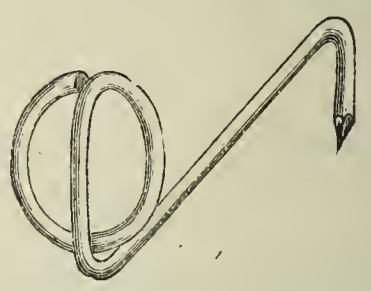


Fig. 1.—Folsom's New Model Roof Snow Guard.

Mass. The application of the guards is shown in Fig. 2, the point of the guard being driven in above each slate, the joints being left open for the shanks or body parts of the guards. The manufacturers recommend their use distributed over the whole area of a roof to obtain the best results, and state that each guard will protect 300 square inches on a ¼ pitch roof, 200 square inches on a ⅓ pitch roof, 100 square inches on a ½ pitch roof, and 50 square inches on a Gothic roof. It is remarked by the makers that where expense is a

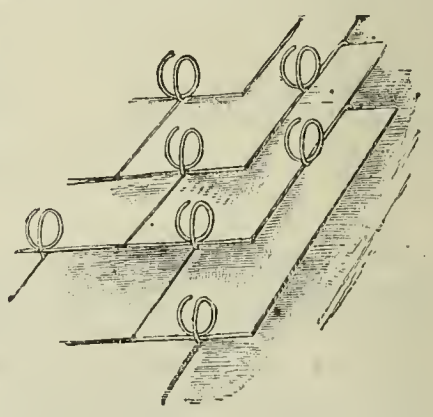


Fig. 2.—Application of Snow Guards.

consideration, or in sections where snow falls are light, five courses of slate at the eaves, with a guard in each joint, are more efficient than a guard rail, and at a fraction of the expense. The manufacturers state that the guards protect roofs by holding the snow immovable where it falls, and that the sun acting upon the large area exposed to its action while the heat of the roof acting upon the under side of the same area, allows

the snow to melt rapidly, leaving the roof clear. It is pointed out on the other hand that a guard rail holds the snow in a large drift on the eaves, where the heat acts slowly, so it alternately thaws and freezes, leaking through the roof and overhanging on the eaves.

FLASHINGS.

THE AMERICAN ROOFING COMPANY, St. Louis and Cincinnati, are running both of their plants at full turn. Their American metallic lathing is meeting with excellent success, and they have recently booked several large orders. They report an increase of over 50 per cent. in their business in the first two months of this year in comparison with last year, and state the present month gives indication of doing as well as the months of January and February.

THE E. E. SOUTHER IRON COMPANY, St. Louis, report an excellent demand for the various forms of corrugated iron which they manufacture. They report the receipt of orders for three carloads in one day's mail, two of which went to Texas, the other to a Northern point. They have recently added new machinery to their factory and have increased their facilities for manufacturing, so that they are enabled to make prompt shipments of either large or small orders.

THE CHATTANOOGA STEEL ROOFING COMPANY, Chattanooga, Tenn., have in process of preparation a new and enlarged edition of an illustrated catalogue, which will be mailed free to any one making application. We understand the volume will be ready for distribution about April 1 and will contain something like 200 illustrations of cornice work and metal roofing. The company are among the largest manufacturers of metal roofing and galvanized iron work in the country, and have a well equipped plant provided with modern improved machinery.

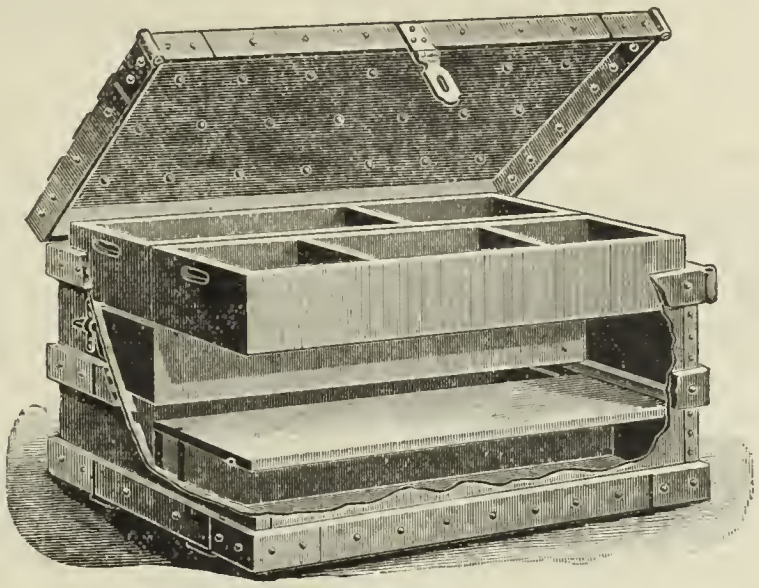
JOHN SEATON & Co., 78-80 Washington avenue, Brooklyn, N. Y., are busily engaged on a number of important jobs covering cornices, skylight and roofing work. They have the contract for the glass and copper work of the winter garden now being built at the North Carolina residence of George W. Vanderbilt, for which the glass to be used is ¾ inch plate and the metal work of the most elaborate nature. The firm are also putting up the skylights, copper cornices and tiling and slate roofs of the new St. Luke's Hospital, and have under way a similar contract for the new building of the American Surety Company at the corner of Broadway and Pine street and for the Presbyterian Mission Building, corner of Fifth avenue and Twentieth street, N. Y. City.

M. F. WESTERGREN, proprietor of the Architectural Sheet Metal Works, 205-207 East Ninety-ninth street, New York City, is busy just now on a number of important contracts. Among the work in hand may be mentioned the copper cornices and skylights of the new building of the University of the City of New York and the roofs and cornices of a number of school buildings throughout the city.

N. BOIS, proprietor of the Eagle Cornice & Skylight Works, 30 and 32 Sullivan street, New York City, has recently aassociated with him as partner M. Steinmetz, with a view to enlarging the business. We understand that Mr. Steinmetz comes from Boston, where he enjoys the reputation of being a practical mechanic in this line.

Vanderman's Steel Tool Chest.

The Vanderman Heating & Plumbing Company, Willimantic, Conn., are manufacturing a new form of their steel tool chest. The chest, illustrated in the accompanying cuts, is known as Style D and is, it will be noted, of different internal arrangement from the other chests which they have been making. The chests are made from $\frac{1}{16}$ inch cold rolled sheet steel with malleable corner pieces and hardwood braces and are fitted with heavy wrought iron hinges and hasps, the cover being so arranged as to be held open by support from the back of the chest. The chests are furnished with brass lock and bolts to screw down the cover at the front corners. They are described as lighter than a first class wood chest besides being much stronger. They are neatly finished so as to present an attractive appearance. Fig. 1 shows the chest with the side broken away, illustrating the arrangement of the compartments, while Fig. 2, which is a section through the chest, further illustrates the arrangement of the drawers and details. Style D is made in four sizes. No. 1 is 11 inches deep, 12 inches wide and 24 inches long, while No. 4 is 19 inches deep, 20 inches wide and 42 inches long, Nos. 2 and 3 being intermediate in size.



Vanderman's Steel Tool Chest.—Fig. 1.—Broken View of Style D.

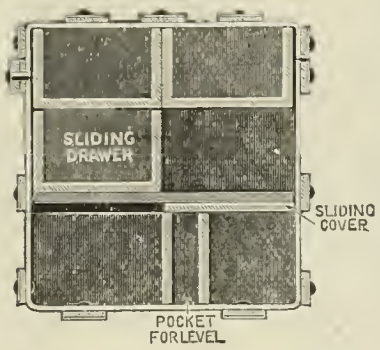
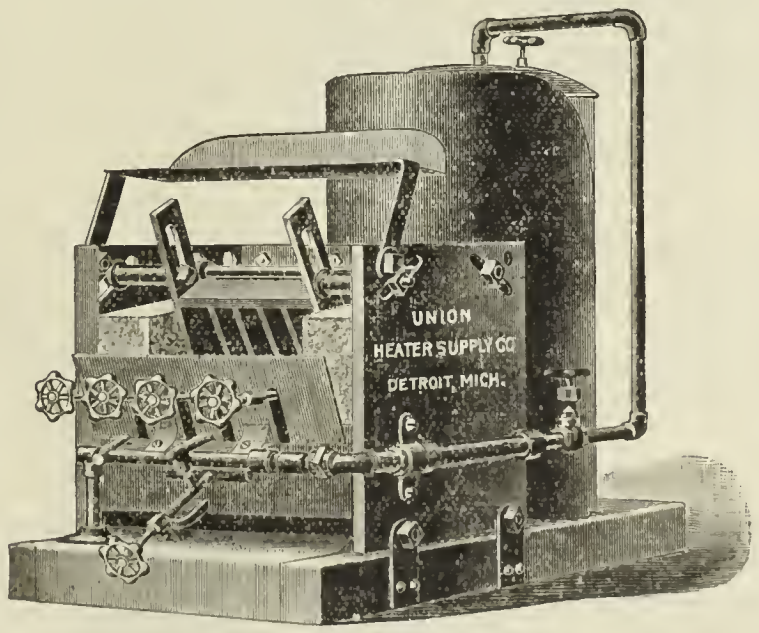


Fig. 2.—Sectional View through Style D.

Rivet Heater.

A very convenient apparatus is found by workmen in the rivet heater shown in the accompanying picture. It is made by the Union Heater Supply Company, 90 Congress street, Detroit, Mich., and gasoline is used for the fuel. It is designed for use by boiler makers and bridge contractors and is adapted for heating rivets for any character of work, taking the place of a blast forge. It occupies little space and the fuel is easily handled and a steady heat is continuously maintained. It is claimed that as fast as the heated rivets are removed from the hopper others drop down to take their place, and that the rivets are heated as fast as one man can drive them. Air pressure is applied to the fuel tank after it is filled, and then no further attention is required by the heater, which, without the dirt of coal, feeds the rivets hot and rapidly. The flow of gasoline is governed by a needle valve, and the burner is of a type that has proven successful and satisfactory. The convenience of the fuel and its low cost for the work accomplished are specially pointed out.



Rivet Heater.

TIN PLATES.

The Black Plate Mills.

John Jarrett of Pittsburgh, secretary of the Tinned Plate Manufacturers' Association of the United States, has recently sent out to the members of that organization and to others interested in the tin plate trade a letter concerning the number of black plate mills in the United States, with present and prospective production, and other matters pertaining to this important industry. The letter in full is as follows:

In accordance with the action taken at the semi-annual meeting of the Tinned Plate Manufacturers' Association the following exhibit is submitted, giving, as we can obtain at present, the number of black plate mills in the United States, present and prospective, the capacity and the American market for consumption of domestic tin plate, &c.:

Name of firm.	Location.	Mills completed and constructing.	Mills contemplated or prospective.
Somers Bros	Brooklyn, N. Y.	4	..
U. S. Iron & Tin Plate Company	Demmler, Pa.	7	..
Marshall Bros. & Co	Philadelphia, Pa.	5	..
Lalance & Grosjean	Harrisburg, Pa.	2	..
Blairsville Rolling Mill & Tin Plate Company	Blairsville, Pa	2	4
New Castle Steel & Tin Plate Company	New Castle, Pa.	16	..
Ellwood Tin Plate Company	Ellwood City, Pa.	4	..
Canonsburg Iron & Steel Company	Pittsburgh, Pa.	3	..
Monongahela Tin Plate Company	Pittsburgh, Pa.	9	7
Pittsburgh Tin Plate Company	New Kensington, Pa.	2	2
New Kensington Tin Plate Company	New Kensington, Pa.	6	..
Wallace, Banfield & Co	Irondale, Ohio.	4	..
Falcon Iron & Nail Company	Niles, Ohio	4	..
Ætna-Standard Iron & Steel Company	Bridgeport, Ohio	6	..
Britton Rolling Mill Company	Cleveland, Ohio	4	..
Beaver Tin Plate Company	New Lisbon, Ohio	4	..
Morton Tin Plate Company	Cambridge, Ohio	4	..
Reeves Iron Company	Canal Dover, Ohio	1	3
Laughlin & Junction	Martin's Ferry, Ohio	6	..
Crescent Sheet & Steel Company	Cleveland, Ohio	4	2
Whitaker Iron Company	Wheeling, W. Va.	2	..
La Belle Iron Works	Wheeling, W. Va.	4	..
Old Dominion Iron & Nail Works Company	Richmond, Va.	4	..
American Tin Plate Company	Elwood, Ind.	16	2
The Morewood Company	Gas City, Ind.	6	10
Irondale Iron & Steel Company	Middletown, Ind.	6	..
National Tin Plate Company	Anderson, Ind	4	2
Montpelier Tin Plate Company	Montpelier, Ind.	6	..
Atlanta Tin Plate Company	Atlanta, Ind.	3	..
St. Louis Stamping Company	St. Louis, Mo.	8	..
Cumberland Steel & Tin Plate Company	Cumberland, Md.	4	..
Baltimore Iron, Steel & Tin Plate Company	Baltimore, Md.	4	6
Illinois Steel Company	Chicago, Ill.	..	18
Great Western Tin Plate Company	Joliet Ill	2	2
Totals		166	58

	Boxes.
Capacity of 166 mills completed and in course of construction, at 30,000 boxes per mill per annum	4,980,000
58 prospective mills	1,740,000
Total	6,720,000
The consumption of tin plates in the United States per annum is about	6,000,000
Deduct supply for Pacific Coast, dressed meats and fish, and for Standard Oil Company, imported plates for export on which drawback is allowed, about	1,500,000
Net market for consumption of domestic plates	4,500,000

Operating the mills completed and in course of construction to their capacity would, therefore, give us an overproduction of 480,000 boxes per annum. Including the prospective mills the overproduction would reach 2,220,000 boxes, or 50 per cent. in excess of the net market for home consumption.

The tin plate clause of the McKinley bill went into effect on July 1, 1891. In less than a period of four years the American tin plate industry has so developed as to more than meet the requirements of the home market. Such growth is unparalleled. No other industry, even with the stimulus of the highest protective duties, has ever made such progress in the same period of time. The industry has now reached a point that calls for the closest investigation on the part of those who meditate going into the business of tin plate manufacture, and closer relationship and affiliation between those already in the business.

It may be interesting to all concerned to know that the tin plate works in England and Wales have an aggregate of 519 mills. Of this number 232 mills were idle during the year 1894. The outlook for the tin plate industry is not the most promising.

SCRAP.

A LATE CABLE DISPATCH from Wales intimates that labor troubles are feared in the tin plate districts. The associated manufacturers propose to insert a strike clause in all contracts.

IT IS REPORTED that the tinning plant of the Wheeling Corrugating Company, Wheeling, W. Va., which is ready for operation, will start into the business of coating tin plates for the market within a short period, procuring the necessary black plate from the Whitaker Iron Company's mills.

IN ORDER to be able to carry larger stocks of merchandise to meet the wants of an increasing business, Merchant & Co., Incorporated, now located at 247 Pearl street, have leased for a term of years the five-story building 245–247 Water street, having a frontage of 37 feet and good depth, where C. H. Bolles, Jr., the New York manager of Merchant & Co, Incorporated, will be pleased to meet on April 1 his many customers in New York and adjacent cities. The Brooklyn store of Merchant & Co., Incorporated, on Flushing avenue, will remain as before under the personal supervision of the New York office.

J. A. NEIL, president of the Montpelier Sheet & Tin Plate Company, report their works about completed and ready to go into operation about March 12. These works consist of four of Totten & Hogg's hot mills, also four of their cold mills. The tinning department will contain 11 stacks with capacity for tinning the entire product of the mills. These works, although located in Indiana, are virtually a Columbus, Ohio, enterprise, and it is there the general office is located. Harry Herbert, late superintendent of the New Castle Steel & Tin Plate Company, has charge of the works. Neil Fahrion & Co. of Columbus, Ohio, are the general agents of the compsny for the purchase of all material and sale of the products.

AN ITEM in the Pittsburgh *Times* records the fact that P. H. Laufman, the pioneer tin plate manufacturer of that city, celebrated the fifty-second anniversary of his joining the Methodist Church on March 3, by making an address in the Oakland Methodist Episcopal Church, in which he urged his hearers to be practical Christians. Commenting on this, the *Times* remarks: "It is probable that Mr. Laufman's employees to the last man would testify that he practices this precept. He was never known to hold out against the signing of the wage scale that any other manufacturer could work under, and he has frequently declared that he would rather not run his plant than do it by paying starvation wages. His plant at Apollo has often been running when many others were closed pending the settlement of disputes. His seems to be a case, too, where practical Christianity was profitable, as it is not of record that he was ever anything else than prosperous."

THE ANNOUNCEMENT IS MADE that the National Tin Plate Company will have their new plant, at Anderson, Ind., in full operation by May 1. Employment will be furnished to several hundred men.

THE WHITAKER IRON COMPANY, Wheeling, W. Va., have resumed work at their mills after a temporary idleness. Several of their sheet mills have been altered into tin mills and the company will shortly be putting out a good supply of black plate for tinning purposes.

A LETTER received from San Francisco, dated at the close of February, contains the following particulars in regard to the tin plate trade on the Pacific Coast: "There has been no great activity in tin plate, but the stock on hand has been very low and that has

exerted a favorable influence on prices. The Alaska salmon fleet is now being fitted out and demand is brisking up a bit. The result of these various influences, the light stock and the improved demand, has been to cause an advance to $4.75 to $5. Unless we pretty soon receive large invoices we may expect to see a further advance. We are now receiving some by rail, but at best this is an expensive method of transportation. The total imports since the opening of the year have been 34,258 boxes. The probabilities are that the pack of salmon and canned fruits will in 1895 be larger than ever. In 1894 there were 3,000,000 cases, 144,000,000 tins, of both packed. This required a good deal of tin plate."

THE AMERICAN TIN PLATE COMPANY'S Works, Elwood, Ind., are reported as turning out 6000 boxes of tin plate a week. The list of workmen has been nearly doubled recently. Nine mills are in operation.

THE MCLANAHAN & STONE FOUNDRY COMPANY have shipped one of their largest bar shears to the Atlanta Steel & Tin Plate Company, Atlanta, Ind.

WE HAVE BEEN WELL SUPPLIED with blotters by N. & G. Taylor Company, Philadelphia, who take this means of calling attention to several of their brands of tin plates. One relates to the Brilliant and Royal Bright; next to Taylor's Old Style roofing; next to Columbia terne. Then comes the Taylor roofing tin; another relates to four standard brands which they enumerate, while two larger blotters give some further information about their Old Style, the features of its manufacture being referred to.

THE WORKS of the Ashburnham Tin Plate Company, Burry Port, Wales, restarted on Tuesday after a prolonged shut down.

ACCORDING TO ENGLISH ADVICES there is some talk of a general stoppage of the Welsh tin plate mill throughout next month.

THE NEW CASTLE STEEL & TIN PLATE COMPANY have purchased 6 acres of land lying to the north of their mill. It is excellently adapted for manufacturing purposes, being near the railroads and affording plenty of room for additions to the mill and for the side tracks needed.

LAST WEEK ground was broken for the erection of the new tin plate plant of the Laughlin Iron Company at Martin's Ferry, Ohio. A full description of this new plant has already appeared in these columns. The Totten & Hogg Iron & Steel Foundry Company of Pittsburgh have the contract.

THE *British Iron and Coal Trades Review* states that a firm of tin plate manufacturers at Llanelly, South Wales, have under consideration an offer made by a Chinese firm for the supply of tin plates for nine months in each year for the next seven years. The order had not yet been booked by last advices, but the firm referred to expect to secure it. This might open up a new market for British plates.

PRESS DISPATCHES from Baltimore, Md., assert that three new tin plate works are to be put in operation in that city or its vicinity this year. The largest will, it is said, be started with Chicago capital, Norton Brothers, the well-known can makers of that city, being largely interested. The Stickney Iron Company of Baltimore are also credited with the intention of building a tin plate mill, to be operated in connection with their iron works at Canton. Orders for a 1000 horse-power Corliss engine and boilers for the new works have been placed with the Maryland Steel Company, at Sparrow's Point, Md. The third works will, it is rumored, be located at Curtis Bay, in conjunction with a rolling mill plant now being built there.

Trade Notes.

FOLLANSBEE BROTHERS COMPANY, successors to James B. Scott & Co., 122 and 124 Second avenue, Pittsburgh, Pa., in their advertisement elsewhere in this issue direct attention of the trade to their Scott's Extra Coated Guaranteed Roofing Tin Plate. The trade are requested to send for pamphlet giving description of this brand and *fac similes* of testimonials received from consumers. Attention is also directed to their Triumph Old Style, which is referred to as containing a little less coating than the above grade, but is a palm oil process Plate.

CARL H. ARWE, 1348 DeKalb avenue, Brooklyn, N. Y., issues an illustrated catalogue of supplies for the bar, wine and liquor trade which he manufactures. A variety of Bar Urns are illustrated and described, besides miscellaneous supplies. A price list accompanies the circular.

IT WILL BE SEEN by an announcement elsewhere in this issue that the Clifton Springs Mfg. Company, Clifton Springs, N. Y., are still in existence and ship large quantities of the Evans Patent Anti-Rusting Tinware. This well-known ware is distinguished by their trade-mark, which is a Greek cross.

THE ARTICLES OF INCORPORATION of the Hygeia Ventilating and Manufacturing Company have been filed at Quincy, Ill. The stock is $3000 and is held by George Bakewell, William Scharnweber and R. E. Tearse, $1000 each.

WE ARE GLAD TO KNOW that the Joseph Dixon Crucible Company, Jersey City, N. J., are to continue their practice of sending out monthly calendars on office blotters, the same as they did last year. They are serviceable reminders of the Dixon Pencil.

BATES & ANDERSON will operate a brass foundry in New Orleans, La.

IN THE COURTS at Pittsburgh last week Geo. S. Griscom, receiver of the Moorhead-McCleane Company of that city, filed an answer to the application of the New York Life Insurance Company for permission to foreclose a mortgage of $350,000 on the property of the company. Mr. Griscom states that in the present depressed condition of manufacturing interests if the New York Life Insurance Company are allowed to foreclose and sell the property it will be sacrificed and result in a total defeat of the hopes of the extension creditors in securing something on their notes.

A FEATURE in the Paint trade has been developed at Boonton, N. J., by the Atlantic Paint Works, who convert puddle furnace slag into a paint pigment, for which claims of superiority to the ordinary Oxide of Iron Paint are made, it being stated that it is much harder, absolutely non-corrosive, and is of greater covering capacity. It is asserted that the intense heat to which this slag is subjected in the furnace causes a complete union of metallic iron and silica, forming the gloss of iron, which for structural iron, bridges, metal roofing, boilers, ship bottoms, stacks and similar purposes proves a most desirable Paint. It is stated that this Paint is particularly adapted to structural iron work located on or near the seashore. The company have a sales office at 275 Broadway, New York.

ON FEBRUARY 27 the creditors of the Sun Vapor Street Lighting Company of Canton, Ohio, bought in the plant and business of the concern at auction sale for $87,025. The receiver has been operating the plant for the creditors for over a year and has made a profit. The company have lighting contracts for different parts of the country on hand, and the plant will continue in active operation.

THE WILMOT & HOBBS MFG. COMPANY, Bridgeport, Conn., whose rolling mill was burned recently, have made an adjustment of their insurance, which amounts to $63,000, and the company are now preparing to rebuild. A large fire proof main factory will be built, and other plans are being prepared looking to the construction of one of the finest plants in New England.

THE YOUNGSTOWN STAMPING COMPANY, Youngstown, Ohio, have been reorganized under the name of the Youngstown Specialty Mfg. Company. The stockholders of the new concern held a meeting recently and elected the following directors: Wm. R. Stiles, Alexander Dickson, C. M. Russell, Thos. Nesbitt, Charles J. Wick, J. Craig Smith, Henry Tod, B. F. Wirt and Geo. E. McNabb. The directors organized by electing the following officers: J. Craig Smith, president; William R. Stiles, vice-president; Chas. J. Wick, treasurer; W. C. Hine, secretary and general manager. The line of goods manufactured by the Youngstown Stamping Company will be continued by the new concern, and will consist of Glass Oil Cans, Galvanized Oil Cans in large variety, Water Buckets, sugar makers' supplies, Fruit Cans and Sheet Metal specialties of various kinds. These will be augmented by a full line of Lard Pails, Paint Cans, Baking Powder Cans and Spice Cans. The newly organized company start out under very favorable surroundings and the outlook for a prosperous future is exceedingly encouraging.

AMONG recently chartered corporations in New York State is the Estey Wire Works Company of New York City, organized to manufacture and deal in Wire Cloth, Iron Wire and Brass Work and Wire Goods; capital, $25,000; and directors, W. S. Estey, Cornelius P. McGuire and John C. Hessler of Brooklyn, and W. O. Chapman of Plainfield, N. J.

Plans have been completed for the consolidation in New York City of the Astor and Lenox Libraries and the Tilden fund, together with the private library of the late Samuel J. Tilden, under the name of the "Public Library of New York, Astor, Lenox and Tilden Foundations."

In an open letter written to the cotton growers of the South, A. B. Shepperson, editor of *Cotton Facts* and secretary of the Senate Sub committee on Agriculture, urges that food crops of every description should be raised on all Southern farms and that cotton should be made a surplus or money crop.

PLUMBING and GAS FITTING.

Association News.

New York State Plumbers.

The seventh annual convention of the Master Plumbers of the State of New York was held at Troy on Tuesday and Wednesday in Harmony Hall, which presented a pleasing appearance, having been tastlly decorated by the general committee of the local association. Large flags were draped at the rear of the platform and on the walls of the room, and small flags had been placed in the chandeliers. About 70 delegates attended the opening session. The delegates were introduced to Mayor Molloy by William H. Barnes, president of the local association, and the hospitality of the city was extended to the visitors.

The officers of the State association, who were nearly all present, are: President, William J. McDermott of New York; vice-president, Henry E. Wieber of Rondout; recording secretary, Chas. Schloesser of New York; financial secretary, Horace F. Wescott of Albany; treasurer, William G. Reid of Rochester. President McDermott opened the convention with an address and he was followed by Wm. H. Barnes. The convention then began its regular business.

The Committee on Credentials was James Temple, Troy; Henry E. Wieber, Kingston; J. C. Shumway, New York; J. Edward Janes, Albany, and John A. Creelman of Rochester. After hearing the report of the committee adjournment was taken until 2 o'clock in the afternoon. On the opening of the afternoon session Financial Secretary Wescott presented a report. Charles Schloesser, recording secretary, read a communication from Hudson plumbers, asking the aid of the State association to defeat the project to repeal the State plumbers' registration law so far as the clty of Hudson is concerned. The communication was laid over to be taken up in executive session. A number of recommendations to be acted upon at the next national convention were adopted. A musical entertainment was given in the hall in the evening for the diversion of the delegates.

Wednesday morning was largely occupied with the reports of the committees of the organization, President McDermott occupying the chair. The association received a communication from the secretary of the National Association of Master Steam and Hot Water Fltters, in which it was stated that the formation of a State organization for the latter body was contemplated and that a meeting for that purpose would occur the next morning. The communication requested the co-operation of the plumbers' State association and that the members attend the meeting. The association adopted a resolution approving the project, and giving as the sense of the gathering that it would be well for as many of the delegates as possible to attend the session of the steam and hot water fitters.

A resignation of the Brooklyn association from the State organization was received. A resolution was adopted directing that the resignation be held by the Executive Committee until after a committee of three from the association had conferred with the Brooklyn men. John Mitchell of New York, William Tobin of Syracuse and George Kirchoff of New York were named a committee to visit the Brooklyn association and induce it to continue its State membership.

A committee appointed to consider the action of the Executive Committee reported that the *per capita* tax of members of local associations belonging to the State association should be 75 cents. The *per capita* tax of members of the State association who were not a part of a local body was fixed at $5, $2 of which should be transmitted to the secretary of the National Association. This last named decree was adopted as a part of the constitution.

At the closing business session the officers were re-elected as follows:

President, William J. McDermott of New York.

Vice president, Henry E. Wieber of Rondout.

Recording secretary, Charles Schloesser of New York.

Financial secretary, Horace F. Wescott of Albany.

Treasurer, William G. Reid of Rochester.

The following were chosen delegates-at-large to the State convention: Wm. C. Vrooman of Schenectady; W. H. Barnes, Troy; John Yule, New York. Delegates to the national convention in June at Philadelphia: W. J. McDermott, John Yule and Charles Geiger of Buffalo.

The next State convention will be held in New York City.

Votes of thanks were given to the newspapers of Troy and trade papers for courtesies, and the local association, whose president is W. H. Barnes, received a special expression of gratitude for hospitality generously rendered. President McDermott spoke specially of Mr. Barnes' efforts.

The general committee of the Troy association of plumbers who had charge of the arrangements was: President, William H. Barnes; vice-president, James Temple; secretary, Wlliam F. Quinn; treasurer, William Ferguson; Martin Mulligan, Samuel Morris, Michael Kennedy, E. L. Murphy, George Bowman and Charles Wills.

After the adjournment the delegates and invited guests, numbering 150, were escorted to the banquet hall. William H. Barnes, president of the local association, presided, and on either side of him were John Mitchell of New York, president of the National Association of Master Plumbers, and William J. McDermott of New York, president of the State association. The other officers of the State association occupied seats at the president's table. After the banquet President Barnes, as toastmaster, introduced National President Mitchell, who spoke on "The National Association" in a forcible address.

State President McDermott outlined the purposes of the association and encouraged the members to renewed activity during the coming year.

J. L. Wells, chairman of the Executive Committee of the National Steam and Hot Water Fitters' Association, spoke on "Our Brother, the Steam and Hot Water Fitter." He referred to the intention to form a State association of the steam and hot water fitters. Vice-President James Temple spoke to the toast, "Our Local Association."

Samuel Morris was also called upon to speak, and he made one of his happy and effective speeches, wittily defending the plumbers from the criticism of the general public and other tradesmen and showing that the members of the plumbing trade were often compelled to bear censure which belonged upon the shoulders of others.

Edward W. Loth spoke for "Our Architects," and gave a tribute to the growth of sanitary science as illustrated in the plumbing of to-day.

In great good humor with the banquet and the successful convention, the assembly dispersed about 1.30 o'clock.

Ohio State Plumbers.

The annual convention of the Ohio State Master Plumbers' Association convened last week at Columbus and was opened by President Robert Raitz of Toledo. D. N. Kelly introduced Mayor Karb, who delivered a very happy address of welcome.

The work of the convention was then taken up. E. J. McNamara was made sergeant-at-arms and D. H. Roberts of Cleveland, W. P. Harper of Cincinnati and A. G. Miller of Lancaster were appointed a Committee on Credentials. A recess was then taken until afternoon, when the committee reported the following as delegates duly elected and authorized to sit in the convention: E. R. Brohl, Sandusky; J. W. Brown, Tiffin; Frank N. Olmstead, Conneaut; Charles Schriever, D. H. Roberts, A. L. Baker, Frank Feller, W. J. Worden of Cleveland; J. McVey, Lima; E. J. Nolan, F. E. Hopper, Charles Hicks of Cincinnati; W. G. Wacker, John E. Schultz, Al McLennan, Thomas Mannan, Toledo; A. G. Miller, Lancaster; James Sorenson, Ravenna; Thomas Clark, Mt. Vernon; H. Wilson, Defiance; E. Futerer, E McNamara and William Halley, Columbus; E. S. Collier, Uhrichsville, and R. P. Willis of Springfield.

The Auditing Committee was composed of Louis Poplowski, Cleveland; Ed. Freheren, Columbus; James Gibson, Cincinnati; and the Committee on Resolutions of E. Dolan, Cincinnati; Warden Clive and Mr. Olmstead, Conneaut.

President Raitz in his annual address recommended that the dues of the association be increased from $1 to $2 in order to make possible the employment of an organizer, whose business would be the better organization of craftsmen in the small towns and cities. This recommendation was adopted. He further recommended that closer relations be maintained between the association and the manufacturers and jobbers, and that co-operation with them

be made more of an object than formerly. The general object of the association, in brief, is to secure a better grade of plumbing, the adoption of laws, both State and municipal, and to see that those only are permitted to do plumbing who are thoroughly competent and skilled workmen. To govern and control prices is not one of the objects of the organization.

A plumbing law was presented and it was decided to recommend its passage by the Legislature, and the Legislative Committee was instructed to present it for consideration at the next session.

The officers elected were as follows: President, Edward A. Futerer of Columbus; vice-president, E. J. Nolan, Cincinnati; secretary, Samuel Eswein, Columbus; treasurer, William Halley, Columbus; members of the Executive Board at Large, F. Hopper, Cincinnati; J. E. Schultz, Toledo; E. R. Brohl, Sandusky, and the retiring president, Robert Raitz of Toledo.

Delegates to the national convention to be held in Philadelphia were selected as follows: Louis Poplowski, Cleveland; J. M. McVey, Lima; alternates, F. Hopper of Cincinnati and A. G. Mills of Lancaster.

The next State convention will be held in Cincinnati in February, 1896.

An address was delivered by Inspector of Buildings Harris on the subject of plumbing in its relation to heating and ventilation. P. J. Magley also responded in a neat address to an invitation to talk to the convention.

The visiting delegates went to the Grand Opera House as the guests of the master plumbers of the city. Harrie D. Crane of Cincinnati, president of the National Association of Master Steam and Hot Water Fitters of the United States, was among the guests. After the theater all the delegates participated in a "Dutch lunch" at the Grand Central Hotel.

About 70 were seated in the dining room and enjoyed the tempting spread. Following the banquet came a season of speechmaking, story telling and singing, which lasted until an early hour in the morning.

THE PLUMBERS of Chester, Pa., are taking active steps for the organization of a master plumbers' association, and held their second meeting for the purpose of furthering the preliminaries last week. Another meeting will be held on Monday evening, March 11, when it is hoped to perfect the organization.

ABOUT 20 MEMBERS of the St. Louis Master Plumbers' Association and the Central Supply Association met in the Southern Hotel, St. Louis, last week to talk over matters of mutual interest.

THE MASTER PLUMBERS of Newburg, N. Y., held a meeting last week in the room of the Inspector of Plumbing at the City Hall. A. C. Smith was elected chairman and A. H. Pickens secretary. An informal discussion was held, lasting over an hour, but no organization was completed and an adjournment was taken subject to the call of the chairman and secretary.

THE Master Plumbers' Association of Toronto, Canada, has elected the following officers: President, Thos. Cook, 320 Parliament street; first vice-president, W. J. Burroughs, 353 Queen street west; second vice president, Geo. Guest, 71 Queen street east; secretary, K. J. Alison, 668 Yonge street; treasurer, A. Fiddes, 50 Jarvis street; sergeant-at-arms, Walter J. Garratt, 128 Bay street. The Executive Committee will consist of these officers, exclusive of the sergeant-at-arms.

Chicago Apprenticeship Code.

An apprenticeship code has been agreed upon by the Chicago Master Plumbers' Association and the journeymen's association, which will command the attention of all who are interested in the plumbing trade. There had been a code in use by some of the Chicago master plumbers for a number of years, and, later, Articles of Agreement were accepted by the two associations, which contained a section providing for an apprenticeship code. This code, which has now been adopted, is as follows:

ARTICLE 1. The term of apprenticeship shall be five years. The apprentice shall first register with the secretary of the C. M. P. Association, and after satisfying him of his ability to learn the trade he issues him a card to be retained by him during his service with him or any other employer. Said card must show five years' actual service. If he desires to leave he must apply to the secretary of the C. M. P. Association, who issues him a transfer after consulting his former employer.

ARTICLE 2. The apprentice for and during his five years' apprenticeship shall be under the jurisdiction of his employer.

ARTICLE 3. After serving his five years' apprenticeship he shall be examined by an examining board composed of the president and secretary of the C. M. P. Association, the president and secretary of the C. J. P. P. and B. Association, and the chief inspector of the Health Department of the city of Chicago, and if found competent by the board of his ability to act in the capacity of a journeyman plumber, he shall receive a card which entitles him thereafter to the standard rate of wages.

ARTICLE 4. Each employer may employ apprentices in the ratio of one to every two journeymen plumbers; provided, however, that each employer is entitled to one apprentice in each shop.

ARTICLE 5. Each employer may employ what is now known among the trade as junior plumbers in the ratio of one to each journeyman plumber; provided, however, that each employer first employs a journeyman plumber before employing a junior.

ARTICLE 6. It is expressly understood that no journeyman, junior or apprentice shall work for any employer in any shop where these rules are not enforced.

ARTICLE 7. All junior plumbers who may be working at the trade and belonging to the juniors' union at the time that this agreement is ratified by both associations, shall be left to the discretion of the examining board, ascertaining the length of time he has served and his knowledge of the trade, and if any are found competent to act in the capacity of a journeyman plumber, he shall receive a card which entitles him to the standard rate of wages.

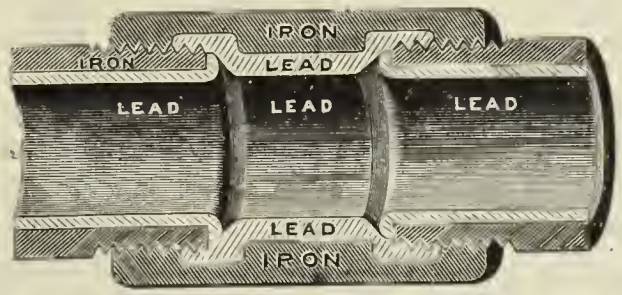
ARTICLE 8. The sons of master plumbers now at the trade shall not be controlled by this apprenticeship code, but all that start at the trade after the ratification of this code shall be controlled by it.

ARTICLE 9. After the ratification of this apprenticeship code by both associations the examining board shall meet as soon as possible to arrange the methods by which examinations shall be made.

JAMES J. BARRETT,
D. M. QUAY,
J. P. NEUERBURG,
JOHN G. MITCHELL,
WM W. PETRIE,
JOHN S. KELLEY.

Lead Lined Iron Pipe.

An article of wide interest and adaptability is shown in the picture of lead lined iron pipe herewith. It is manufactured by the Lead Lined Iron Pipe Company, Wakefield, Mass., who guarantee all their pipe and fittings to stand



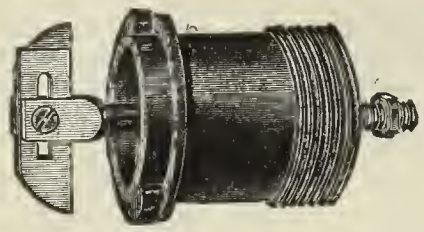
Lead Lined Iron Pipe.

a water pressure of 300 pounds. The pipe is made in 16-foot lengths in all sizes from ½ inch to 4 inch and a full line of cast iron lead lined fittings are made for use with the pipe. The pipe is adapted for water or gas mains, and owing to the smooth inner surface it makes an excellent soil pipe, there being nothing on which there may be an accumulation, and a single flush clears the pipe. The fittings have a portion of the thread in the lead, so that water does not come in contact with the iron. In working the iron pipe may be cut with an ordinary pipe cutter, but the lead should not be cut until the two parts are slightly separated, then the lead lining should be cut with a knife and the end finished with a special tool that is furnished free for the purpose. In making up the joints no paint or cement is needed, as the lead lining of the pipe beds tightly into the lead lining in the fitting. The lead lining affords an excellent protection for the iron against rust and effectually stops all pin holes, sand holes, &c., and prevents, it is said, the leakage of gas even under pressure. For a vent pipe on a plumbing system there is no possibility of rust scales dropping down and closing the bends when the traps are likely to be siphoned. For exposed plumbing it presents a neat appearance as a soil pipe, and claim is made that it has all of the advantages of brass pipe at a much less cost. Over 2,000,000 feet of the pipe are said to be in use, and it has been used as a supply pipe in the Lincoln School and Armory Building in Wakefield and in the Carter office

building in Boston with satisfaction. The pipe is being used by a number of leading New England plumbers and in some fine buildings.

Salvage Closet Connection.

Sproul & McGurrin, 186 East Fulton street, Grand Rapids, Mich., have brought out the salvage closet connection herewith illustrated, which is designed for the repairing of earthenware closets of all kinds when the flush or



Salvage Closet Connection.

revent horn is broken off. It can be attached without removing the bowl, has the standard thread and can be put in place if only a part of the horn is broken off, without the necessity of having the balance smooth. The manufacturers state that this will not only save the closet, but will make it better than new.

The Star Couplers on Supply Pipes.

The accompanying illustration, which shows a sectional view through a house, indicates the application of the Star coupler to the supply pipe plumbing. These couplings, which have been illustrated in the columns of *The Metal Worker*, are useful for making various joints, as the diagram indicates. The illustration shows a system in all of which the straight sections are of wrought iron pipe and all the tees, ells, crosses and fittings, bibbs, cocks, stops and wastes are for iron pipe, while all the curves and rounded sections are of lead pipe, the connection being in all cases made with the Star coupler. The coupler is a mechanical connection and is said to make an absolutely water tight joint under any pressure or temperature and a joint that can be uncoupled and coupled up again when necessary.

TRAPS AND VENTS.

Wolcott & Pratt have bought out the firm of C. N. Allen & Co., Newtonville, Mass. They came from Amherst, and have both had a practical experience in the business of plumbing and steam and hot water heating.

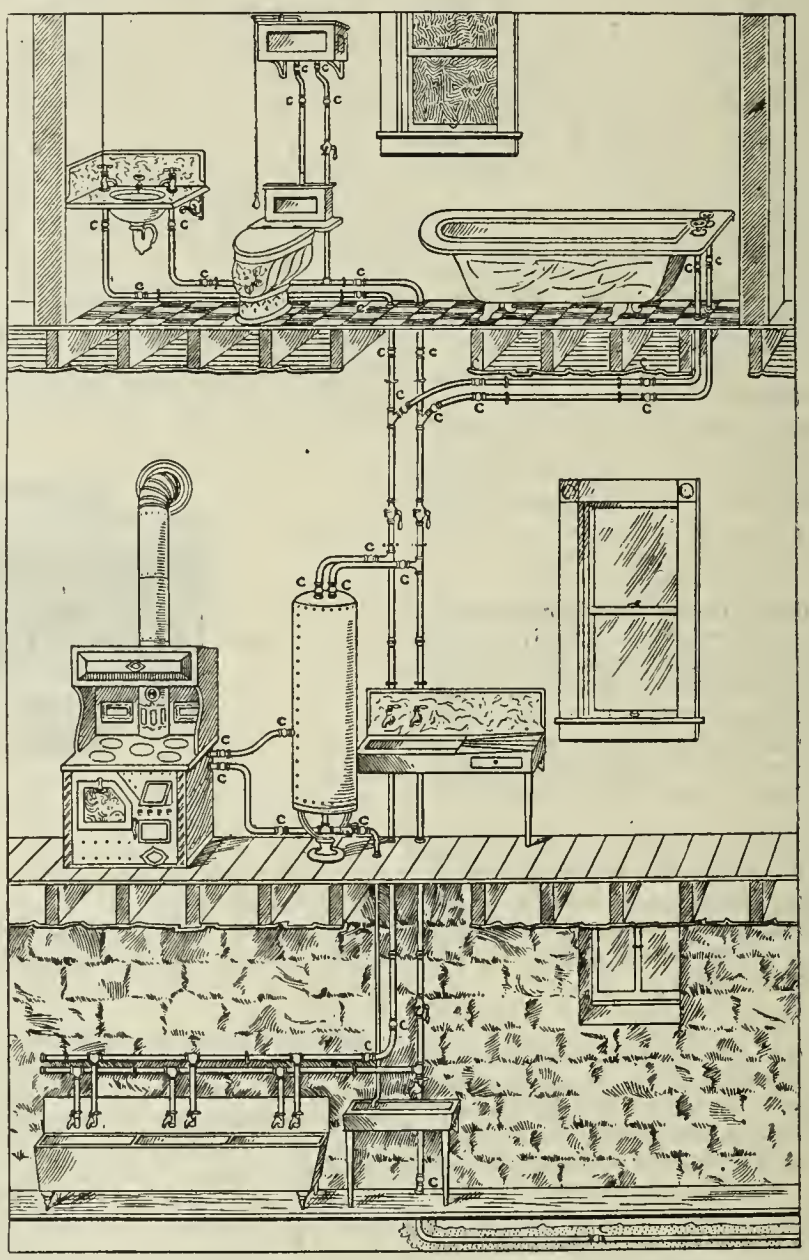
Abel P. Randall has leased the rooms in Dixon House Court, Westerly, R. I., for a gas fitter's and plumber's establishment.

John Delahunt of Fall River, Mass., who lost three children from alleged defective plumbing, has begun suit in the name of one surviving child for $5000, alleging that the illness was caused by a defective drain pipe due to the negligence of the landlady.

The plant of the National Lead Works has been removed to Cincinnati, Ohio, from Louisville, Ky., where it has been operated for several years. This concern will give employment to a number of men.

The Humphrey Mfg. & Plating Company of Kalamazoo, Mich., have issued a very attractive catalogue of their automatic instantaneous gas hot water heater. This is a combined instantaneous water heater and bathroom warmer. The burner is so arranged that it can be swung out from under the heater, and in that position can be used to warm the bathroom. An automatic valve is used to prevent accident in case the supply of water should give out or the operator forget to turn it on. The gas burner cannot be lighted under the heater unless water is actually flowing through the valve.

Thomas Wall, Jr., and Michael Walsh have been registered proprietors of Wall & Walsh, and Wm. and Wm. Henry Murphy have been registered proprietors of Wm. Murphy & Sons, plumbers, Montreal, Canada.



The Star Couplers on Supply Pipes.

Kelly & McCormick is the name of a new plumbing firm at Ottawa, Canada.

J. C. Murray has moved his plumbing and tin shop to the Krogh Building on K street, Tulare, Cal.

Dansburg Brothers & Blake have opened a plumbing shop on Sumner street, La Crosse, Wis.

John L. Knowles of Carnegie, Pa., has just completed arrangements to open up a branch of his business at 1008 Eleventh avenue, Altoona, where he will handle all kinds of electrical and plumbers' supplies.

Arthur T. Pratt and Walter B. Wolcott of the firm of Pratt & Wolcott, Newtonville, Mass., both passed successfully the examination for master plumbers.

C. L. Hicks, who was burned out recently, has leased the large store on the corner of Phœnix and Abbott avenues, Waterbury, Conn., which he is now fitting up for his plumbing business.

Andrew J. Fiske, one of the prominent business men of West Newton, Mass., died of pneumonia at his home on Henshaw street, on Wednesday. Mr. Fiske was 56 years of age and was born in Framingham, where the members of his family were old residents. Mr. Fiske went to West Newton about 30 years ago and had since conducted a plumbing and hardware business on Watertown street. He was at one time elected on the citizens' ticket to the common council and served one term.

All the sewer pipe concerns located in Ohio, Virginia, Pennsylvania and New York, with the exception of one Pennsylvania concern, have formed a combination. It has been decided that the works making sewer pipe from fire clay shall sell all their goods through the Central Sewer Pipe Company, with offices in Pittsburgh, and those making sewer pipe from shale will sell their product through the Union Sewer Pipe Company of Akron, Ohio.

The plant of the Sharon Clay Mfg. Company, Sharon, Pa., manufacturers of vitrified salt glazed sewer pipe and building blocks, resumed operations on

the 25th ult., giving employment to 60 hands.

THE PLEUGER & HENGER MFG COMPANY, St. Louis, Mo., issue under recent date their No. 8 catalogue of water works specialties. In an announcement to the trade they call particular attention to their line of water works specialties, especially their large variety of hydrants, which they say are constructed upon the best mechanical principles. Service boxes, valve boxes and gate valves occupy the first 20 pages of the pamphlet. Then come their hydrants, of which a very great variety is shown. The hydrants are illustrated by general and sectional views and full descriptive particulars are given, so that a thorough understanding of their constructive features may be readily obtained. Tables of sizes and prices accompany the illustrations. Street washers are shown in large variety and a number of special hydrants, self-closing and non-wasting and other kinds. The larger part of the pamphlet is given up to goods of this sort, and any one having need of water works specialties of the kind indicated will find a very large assortment to choose from in the goods of the Pleuger & Henger Mfg. Company.

AT A GENERAL MEETING of the Board of Health of Schenectady, N. Y., the following communication from the Board of Plumbers and Plumbing was received and adopted: "*Resolved*, that the water test now in use in this city for the inspection of plumbing work be kept on all soil and drain pipes not less than five hours, and that the test also include all lead bends and rough lead work under the floor or floors."

THE WILKINS MOTOR PUMP OR HYDRAULIC WATER LIFTER is illustrated and described in a little pamphlet distributed by the Columbus Brass Company, Columbus, Ohio, who manufacture the engine. It is a very compact and serviceable pump, and those interested in it will find complete illustrations and descriptions in the pamphlet. A number of testimonial letters refer to the excellent working of the machine. The firm also manufacture water closets, sanitary cabinet work, lavatories, stop cocks, &c., of which brief reference is made in the circular.

PROF. JOHN A. BARRETT, in a special report of the Subway Commissioners to Mayor Schieren of Brooklyn, states as the result of his investigations that it appears indisputable that earth currents from trolley roads in that city are causing extensive electrolysis of water pipes and other pipes and conductors imbedded in the ground at an indeterminate but serious rate. It also appears that there are practicable means at command which are being neglected, and which, if properly organized and applied, would largely abate if not altogether arrest the ongoing destruction.

AT THE EIGHTH ANNUAL MEETING of the Master Builders' Exchange at Philadelphia, held recently, it was reported that the Mechanical Trades Schools attached to the exchange had enjoyed a prosperous year. The classes were well patronized, especially in the plumbing class, although the stonecutting and blacksmithing classes had not their full quota of pupils. In order to increase the efficiency of the schools, a bill has been prepared and presented to the Pennsylvania State Legislature asking for an appropriation in support of the schools. The exchange has an endowment fund on hand amounting to $6245, which has been invested in bonds and notes of the exchange for the benefit of the Mechanical Trades Schools.

A NEW steam and gas fitting and plumbing establishment is to be opened in the Fleming Block on Second street, Little Falls, N. Y., about March 1, by Bradford & Co. Mr. Bradford has been employed by McDermott & Ashenhurst. He has engaged a first-class plumber and will be prepared to do all kinds of work in their line.

JAMES GIBSON, a contractor of Sandy Hill, owns three houses in Victory avenue, Schenectady, N. Y. Lately finding some plumbing work needed in the houses he proceeded to do it himself. This was in plain violation of the provisions of the plumbing code. Gibson was arrested upon the charge and brought before Justice Eisenmenger to answer. The Justice stated that as this was the first offense he would heed the plea for extenuation. He therefore fined the accused $15.

JOSEPH J. CASHEN, Meriden, Conn., who for many years has worked for his brother, William B. Cashen, is soon to go into the plumbing business himself at 65 Church street.

BAUER & SCHNAITTER have removed their plumbing establishment to the new Cable Block on Market street, Sandusky, Ohio.

GLEASON & LANE'S plumbing store, Cortland, N. Y., was visited by a small fire last week.

DESMOND & WARD have opened a new plumbing shop in Roberton's Block at 91½ Salem street, Glenwood, Mass.

WEST & BRANCH, a Richmond, Va., plumbing firm, have dissolved partnership.

MCONEY & BAINE, plumbers, Nashville, Tenn., have dissolved partnership and T. J. Mooney will continue the business.

THE PARTNERSHIP heretofore existing at Louisville, Ky., in the name of the Smith Strouse Plumbing Company, has been dissolved.

ROBERT J. MOONEY had a small fire in his plumbing shop at Summit, N. J., last week.

THE BILL before the Tennessee Legislature providing for a plumbing inspector in towns of 5000 inhabitants has passed the second reading.

ANDREW MOE, late of the firm of Heckstadt & Moe, has opened up a new plumbing shop, 202 Kelsey street, Eau Claire, Mich.

THE BOARD OF HEALTH of Hudson, N. Y., have decided to retrench in the expense of city government by dispensing with the Examining and Supervising Board of Plumbers and Plumbing, and have petitioned their representatives in the Legislature to have the town of Hudson exempted from Chapter 602 of the laws of 1892.

TWO GAS LEAKS that might have proved disastrous have been caused in Brooklyn by thieves, who cut off the lead pipe on the gas meter connections.

WM. WASHINGTON, who has had charge of F. J. Hoffman's plumbing department and tin shop at Fenton, Mich., for the past two years, will open a general plumbing and repair shop at Marlett.

R. M. WILSON, Rome, N. Y., and 92 Walker street, New York City, is sending to the trade a four-page circular of the Solid Sanitary copper bathtub, which has been recently put on the market. The circular is printed in two colors, the picture of the tub being a copper color.

CHAS. P. VANDEVEER, formerly with Dubois & Darrow, is now on the road representing Dimock, Fink & Co., 80 John street, New York, who carry a full line of plumbing supplies.

C. V. HAYNES was in New York recently visiting the plumbing trade in the interest of the King trap, made by the King Mfg. Company, West Troy, N. Y.

JOS. J. MCCABE, Boulder, Col., has sold out his plumbing business to C. F. Wills & Co.

THE AMERICAN TUBE WORKS, Boston, Mass., are issuing a new catalogue of their seamless drawn brass pipe for plumbing, which they say is tested to 1000 pounds hydrostatic pressure. Sixty pages are used in giving the names of plumbers in different cities and the names of their customers where brass pipe has been used in plumbing. In a recapitulation of the buildings it appears that their brass pipe has been used in 18 club houses, 100 homes, hospitals and hotels and over 700 private residences.

WE ARE INDEBTED to the Goulds Mfg. Company, with main office and works at Seneca Falls, N. Y., and warerooms at 16 Murray street, New York City, for their illustrated catalogue and price-list of pumps and hydraulic machinery. The volume, which bears date of the present year, is the thirty-fifth edition of their catalogue, and is a most elaborate and valuable publication for those who wish to keep informed of what is in the market in the line of hydraulic machinery and pumps. The volume, of oblong shape, measures 8¼ x 7¼ inches in size, is handsomely bound in linen, with the title and firm name in gilt letters. As showing the extended assortment of goods made by this well-known firm, it may be mentioned that there are over 350 pages in the catalogue, nearly every one of which contains one or more illustrations of goods which they make. To assist the buyer in searching out the articles he is after in so large a volume, a carefully arranged alphabetical index is given at the beginning of the book, while at the end is an index of figures. All sorts of pumps for all sorts of purposes are included, it being impossible even to enumerate them, there being small pumps for domestic work and large ones for greater service. Power pumps of many kinds are shown, likewise electrical pumps, water rams, air pumps, spraying pumps, hydrants, sinks, drive well points, drills, valves, cocks, taps and dies, &c., are some of the miscellaneous goods that are included. The catalogue contains many new goods and illustrations of their application which have not before been published that will interest the hardware and plumbing trades, to whom the book will be furnished on application.

An engineering undertaking of no small difficulty is to be carried out as soon as the weather will permit on the steel bridge of the New York, New Haven & Hartford Railway over the Thames River, between New London and Groton. The draw of the bridge, which is one of the largest in the world, has worked eastward about 8 inches, and the task before the engineers is to pick up the eastern span and launch it just that distance toward Groton. It weighs 2,600,000 pounds.

STOVE TRADE NOTES.

The Local Stove Trade.

The local stove trade during the last four or five weeks has been in a fairly satisfactory condition and indicative of gradual improvement. To make this assertion without some qualification, however, might be misleading, for the experience of many would be at variance with the statement. After such prolonged depression, signs of first improvement will by many be hard to detect and will be found to exist at first with the larger houses having a line of customers taken from all neighborhoods and from all classes. While with such houses a slight increase in all departments and for nearly all the different grades of goods—cheap, medium and high priced—indicates general improvement, it would affect the small trader so very little that many would be unable to note any change at all. The matter of a sale by such traders of one or two more stoves for a corresponding period, or an increase of a few dollars in the business, might be put to the score of chance rather than improved condition.

Some doubt of an upward turn to business may yet be admissible, and favorable accidental conditions may underlie the increase in the stove business not only during the last four or five weeks, but thus far during the year. Until, however, the year grows older and present indications are set at naught by reverses, there is ground to believe that the tide has set toward better business.

The extreme cold wave last month had some influence on trade and added to the demand in February this year over February of a year ago. Extreme cold cannot be too lightly considered in its bearing on the stove trade, even coming, as the late blizzard did, when the stove business was practically over for the season. To whatever extent it was better because of business improvement it was benefited by the cold wave, of course, and helped to make of February a good month. It is a satisfaction, even if general business is not greatly on the mend, if accidents or abnormal conditions of weather shall give the stove business a special impetus in every month during the year. Had the terribly cold weather continued longer it might not have helped as much as it did, for it would have interfered more with the spring trade, which, from present appearances, may not be delayed beyond the ordinary time when spring activity, governed by the breaking of winter and opening of navigation, usually sets in. The increased trade in February among the larger wholesale houses was equal to the January increase.

As to the future of the stove industry, it is getting to be a question what the term "stove business" now implies and embraces. It has heretofore been confined to the manufacture and sale of cooking and heating constructions for coal fuel, and gas, gasoline and oil appliances have been put in another class, and were for a long time considered as enemies of the regular stove business and counted among the elements of destruction and against the interests of that industry. It is a question whether they should not be nowadays considered as a whole, owing to the extent to which manufacturers, jobbers and retailers include these constructions in their lines and the constant addition of new appliances burning these fuels which the stove trade seem more and more eager to take in to supply the gradual falling off in demand for some coal constructions, owing to the encroachment of these new devices.

The Ohio Stove Trade.

The majority of the reports from manufacturers of stoves and ranges in this section are encouraging, but there are a few founders who are still experiencing unsatisfactory returns for efforts expended upon the trade. With one exception information received from the trade this week testifies to the fact that a larger volume of business was transacted in February this year than in the corresponding month last year, and one manufacturer reports an increase of 100 per cent., and all manufacturers heard from unite in the belief of more confidence among buyers, with more disposition to anticipate wants than heretofore. Though there is a steady and gradual improvement, the resumption of normal conditions is not anticipated until the laboring classes are more fully employed.

But while the increase in the volume of business is a matter of congratulation, there is not a little complaint of low prices and small profits, nor does there seem to be any immediate prospect of a change in this respect. This could hardly be expected, however, as yet and can hardly be looked upon as a discouraging feature, all things considered.

Dealers and manufacturers in Indiana as well as Ohio report accumulated orders and increased activity in making shipments. Orders for pig iron from stove foundries do not indicate any unusual activity, but there is a fair buying movement of a healthful character.

Money in this market continues active, manufacturers being among the largest borrowers, and rates of interest have still further hardened during the week. The outgo of currency to the country, too, has continued on a liberal scale, the reduction in the readily available supply having a marked effect in shaping the course of the exchange market.

The Manufacture and Sale of Warm Air Furnaces from New York State and its Effects on the Heating Stove Trade.

BY WILLIAM H. LANDERS, SUPERINTENDENT SYRACUSE STOVE WORKS.

In the year 1875 the writer was an apprentice in the stove and hardware store of Owen O'Neil, Son & Co., Utica, N. Y. Their business was selling at retail stoves, furnaces and shelf hardware. They also conducted a large job shop for all kinds of heavy work in sheet iron, copper and tin, and which was successfully carried on. This establishment was started in 1816 and had proven a successful enterprise for its owner, who had amassed a fortune from conducting it during these long years. Some well-known manufacturers and mechanics have worked in this shop in its earlier years. One of these was Henry Burden, the originator of the Burden Iron Works in Troy. He was in his earlier days befriended by Owen O'Neil, who helped him in his first steps to successfully establish his business, which is famous throughout the country at the present time. There was the late John Carton, who constructed the first Carton furnace, who in those days was noted as a skilled coppersmith and all-round mechanic, and afterward became head of the Carton Furnace Company, and when he died left his sons a splendid reputation as mechanic and business man.

In this store on an average about 500 stoves were sold annually. Half of these stoves were principally heating stoves of the various kinds made at the time. Their leaders were the Shining Light, made by Bussey & McLeod, and the Light House, made by Ransom & Co. Both of these stoves were successful in working qualities, and many of them are in use at the present day. They proved profitable and popular sellers, and the stove business was always a profitable one. Utica then contained a population of about 35,000 people,

and had ten retail stores, two of them being manufacturers of stoves who also did a retail business. We are merely illustrating what one concern did in those days of selling heating stoves and I suppose it would be a fair average of every house throughout the State in towns of the same population. That volume of business in selling stoves was satisfactory to manufacturer and retailer. No one will deny that business was so that all the men were compelled to work overtime to keep up with the rush during the fall months.

Very few furnaces were then manufactured in New York State outside of Albany, Troy and New York City, and, as an indication of the comparative number of stoves and furnaces sold, the firm mentioned in that year sold only two brick set furnaces of the Culver make. One of these was sold to a jeweler in Utica, and the other set in a church at West Winfield, which was about 30 miles south of Utica. It was an extraordinary thing to sell a furnace, and when sold the average price was in the neighborhood of $400 or $500, and consequently only those who could well afford it would purchase a furnace. The local trade in Utica was principally Richardson & Boynton's and Carton's. Mr. Carton, Sr., personally measured, inspected and saw set up all of his furnaces which were near by, and their success locally no doubt was due to the carefulness with which they were set. This gives us a fair presentation of the comparative standing during the early seventies of the trade on heating stoves and furnaces sold by an average dealer who was not a manufacturer of either. It is hard to realize that this was but twenty years ago, in view of the changes that have occurred in that period.

The firms who had a reputation as furnace manufacturers in those days were Richardson & Boynton of New York City and Fuller & Warren Company of Troy. These two concerns practically controlled the furnace business throughout the State. Boynton's Gas Tight and Lawson's Ruby furnace were standard goods, and were known by their reputation. It was almost impossible to try to convince a dealer that any other furnace had any merit. Five years later, 1880, was the commencement of the boom in the manufacture of furnaces and the gradual decline of parlor stoves. In that year the manufacture of furnaces became a feature of great importance to foundries that were more or less interested in the melting of iron. Commencing at Buffalo, we find the Harris furnace manufactured merely in a local way. At Rochester Trotter & Geddes did quite a local business. At Syracuse John F. Pease & Co. manufactured the Economy furnace, and had just become fairly well established and were branching out for the wholesale business. At Utica the Carton Furnace Company were showing a spirit of progress and were pushing outside for trade. We believe the first example of real enterprise shown in the manufacture of furnaces to which today Utica owes so much was the endeavor of Mr. Francis Kernan, who successfully organized, created and built up a business on the Palace King and Queen furnaces. At Albany Perry & Co. were making the Standard; Fuller & Warren Company were at Troy, while M. Mahoney and Henderson were well known as furnace manufacturers. In New York City there were many local manufacturers: Richardson & Boynton, Boynton Furnace Company, Thatcher Furnace Company, Abendroth Bros.' Union Stove Works, J. L. Mott Iron Works.

This may not be a complete list, but it will give an idea of a number of firms who at that date, 15 years ago, were manufacturing furnaces in a general way. The convenience and comfort of furnaces and the lower range of prices made them more popular, while the better heating of all rooms in a house and the saving of labor for those who carried coal and ashes were thoroughly impressed upon the people, especially upon those building new houses, and furnaces were commencing to find a ready sale. More brick set furnaces were sold at that date, and the simpler portable furnaces had not been well introduced, for as a rule they were not considered as good a furnace, as so much of the heat was lost by radiation, and the brick set was more profitable.

During the 80s all the different manufacturers pushed sales throughout the State and other States and into other fields, and the business became more profitable. Greater enterprise and more salesmen were added and the capacity of the different foundries was increased to take care of the increased business. The chief trouble then was the want of practical knowledge of the different dealers as to how to set a furnace to get good results from it, and in some cases many furnaces were taken out for not being as represented, and the result was the manufacturers were compelled to have salesmen who possessed a practical knowledge and ability to successfully sell and set and instruct dealers in order to get satisfactory returns at the end of the year. After one or two seasons dealers became more practical and showed more enterprise, and competed more for the sale of furnaces, and the result was the writer has seen in small country towns 25 and 50 furnaces set in a single season, and the sale of a furnace, it must be remembered, is equal to at least two parlor stoves.

To show the production of furnaces we will take the average year, say, 1890 and offer as an estimate made merely from observation the following number of furnaces: Buffalo, 500; Rochester, 500; Corning, 500; Syracuse, 2500; Utica, 8000; Troy, 1500, and New York City 8000 furnaces, or in all over 20,000 furnaces. These 20,000 furnaces will take the place of at least 40,000 parlor stoves. Every dealer in the stove and range business will agree with the writer that where a furnace is put into a house ordinarily there is a parlor stove used in the parlor and sitting room and one in the bedrooms or the second story. One or more parlor stoves will be used according to the size of the house. In some places, no doubt, furnaces will take the place of three parlor stoves, so in averaging it up that two parlor stoves are displaced by one furnace, we believe we are perfectly sure that in selling these 20,000 furnaces the manufacturers of heating stoves are deprived of a business equal to 40,000 parlor stoves. We do not believe that in the exchange of the heating apparatus from parlor stoves to furnaces retail dealers have made any more money on the sale of furnaces. The change has made a larger volume of work and it has increased the sale of many other things which go to make up a furnace business. No doubt the volume of it in dollars and cents is larger than it would be if it had been parlor stoves.

Competition on furnaces since 1890 has been fierce both in retail and wholesale, and prices have gradually declined. We do not believe the retailer has made any more money on furnaces than he did on a good sized range or parlor stove. The sale of furnaces has, however, been productive of some good things, for the middle classes, who are consumers of heating stoves, have been able to exchange them for a furnace at a cost of from $100 to $150 for an ordinary eight-room house, and with greater comfort, no doubt, as the result. It is now the modern way of heating houses ranging in price from $1000 to $5000; houses that cost above the latter figure being more apt to use steam and hot water, as the owners are able to buy the more expensive and, we believe, the more thorough heating plant.

In discussing the conditions existing in the local stove trade a writer in one of the Albany papers intimates that improved systems of heating have had a marked effect in reducing the demand for parlor stoves. In recent years there has been a widely extended movement toward an improvement in heating methods, and in every new house hot water heaters or steam pipes are placed about it in such a way as to make the establishment comfortable while stoves are relegated to the background. This change in the method of heating has seriously affected the sales of stoves, and in the opinion of a prominent dealer these constructions are likely hereafter to be used almost exclusively for cooking purposes. Dealers, however, seem to have some hope for next year. The severity of the cold during the last two months has necessitated hot fires, and many old stoves have been burned out. The effects of this will be felt next fall, when it will be necessary to replace them with new stoves. The writer states that the business of the stove dealer has been far from a profitable one during the past winter.

ODD PLATES.

The Eclipse Gas Stove Company of Rockford, Ill., issue gorgeous diplomas to those who are deemed worthy of the honor conferred. The diploma sets forth that the person named is a graduate in the school of the Ancient Reckless and Independent Order of Prevaricators and is permitted to continue lying—ghost, fish, war and mother-in-law stories excluded. The signatures are R. E. Morse, president of the school of liars. and U. R. A Nother, secretary to His Infernal Majesty. We are not advised that the distinction imposed by this diploma is an honor eagerly coveted and highly prized when obtained.

The Peck Williamson Heating and Ventilating Company of Cincinnati have opened a branch house at Webster City, Iowa, making that city a distributing point for Iowa, Nebraska, the Dakotas and Minnesota. E. R. Swan is the manager of the Webster City branch.

The Michigan Stove Company use postal cards of their own design, varying decidedly from those furnished by Uncle Sam. Some of these cards are of linen, some are wood but all are unique. They are generally of large size, so as to be conspicuous in the mails. The latest one issued is a large card 7½ inches long by 4¾ inches wide. The side for the address is perfectly clear, containing nothing but the address of the person to whom it is sent. Turning it over, a handsomely printed and strongly worded advertisement of Garland stoves is read, the point of which is that the Michigan Stove Company undertake to protect legitimate dealers. Garland stoves are not found in department stores, furniture stores, &c.

We are indebted to Isaac A. Sheppard & Co. of Philadelphia, Pa., and Baltimore, Md., for a series of handsomely printed circulars illustrating and describing some of their leading specialties. The first of these circulars relates to an entirely new line of portable ranges known as the Royal Excelsior, a substantial construction of rich and effective ornamentation. This range has been designed to meet the requirements of dealers in towns in which the old style cook stoves still retain the favor of many buyers as well as of those dealers with whom the range business has become well established. The Royal Excelsior is made in a number of styles and sizes and is adapted for use with either hard or soft coal or wood. Among the leading features may be mentioned large end hearth which slides forward, exposing a roomy ash pit with bailed cast iron ash pan, large swinging end door with ample draft slide, capacious flues, Duplex, Dockash or shaking and dumping grate, which can be quickly removed without disturbing either the water front or brick linings and feet, which are independent of the skirt base. Another circular, which is printed in colors, relates to Royal Fidelity ranges intended for burning hard or soft coal, coke or wood. The wide popularity of these goods has caused the manufacturers to add a larger range of this class to the assortment of sizes and varieties heretofore offered. The Royal Fidelity is fitted with horizontal boiler made by the company of the best material, riveted and finished by hand, a pressure of 150 pounds per square inch being guaranteed. The range embodies the modern features and is ornamented in a style which is both clever and effective. The goods are offered in portable form and also for brick setting. The third circular deals with the Fidelity fire place heater, a very attractive stove designed, the makers state, to secure the most pleasing appearance and the most efficient service possible at a moderate cost. It is made of cast iron throughout, has heavy fire pot, draw center grate, inside magazine cover, brick linings above the fire pot, dust flue and cast iron ash pan.

John Thompson, who was for a number of years foreman of the molding department of the Clinton Stove Works, at Troy, N. Y, died at his home in Lansingburg, February 28, at the age of 58. He had been ill for six weeks from an injury sustained at the foundry. An operation was performed in the hope of saving his life, but was not successful. The deceased was an upright citizen and a trusted employee of the Fuller & Warren Company. He was a Knight Templar and a veteran of the late war. He leaves a family.

President Nathan B. Perry of the Perry Stove Company, Albany, N. Y., says regarding the stove trade: "In common with most other branches of business the stove trade has not been up to the standard, but we are hoping for an improvement this year."

B. B. Nickerson, for a number of years in charge of the office of the Spicer Stove Company, Providence, R. I., and well known to every one who has visited that establishment, is now representing the company on the road in New England, where he will push the Model line of stoves and ranges. If Mr. Nickerson is received by the trade with half the courtesy he has always displayed toward visiting traveling men, his lines will fall in pleasant places.

According to our English exchanges, the recent prolonged spell of severe cold weather in that country caused a remarkable increase in the demand for gas and oil stoves. The comfort and convenience of these appliances for heating small rooms not supplied with regular fire places has received a recognition never before accorded to them, and their use is likely to be largely stimulated in the future.

Isaac A. Sheppard & Co., Philadelphia, are putting on the market the Royal Excelsior range, which is of the high oven type and high grade. It is made with high shelf, high closet, end ash pit, with bailed pan, water fronts, reservoir with their patent spigot, Eclipse covers which lift from the middle and nickel trimmings. The range has many other attractions, including an attractive proposition. If a dealer orders one, gives it a high polish and displays it conspicuously, and is not satisfied that it is a seller, he may return it inside of 30 days. If kept longer it is a sale.

L. E. Roberts and J. Snyder of the Thomas, Roberts, Stevenson Company, Philadelphia, were visitors at the New York office, 250 Water street, this week. They are placing an oven thermometer in the oven door of their gauze door ranges to aid the cook in correctly gauging the temperature in the oven. They report that the step has been very popular with the dealers and their customers.

The Lehigh Stove & Mfg. Company, Lehighton, Pa., are using the Cooper oven thermometer in their Model Lehigh range. They say: "It tells the cook when the oven has reached the right heat and helps to keep it there." G. W. Baeder is calling the attention of the trade in New York and vicinity to this feature and their general line of Lehigh goods.

The Estes Stove Company have been organized at Birmingham, Ala., to carry on the business hitherto conducted by the firm of Penninger & Estes.

Luther & Lederhos have moved their gas stove shops and salesrooms to 9 and 13 Desbrosses street, New York.

Sam S. Utter, 113 Beekman street, New York, recently made a visit to Boston, Mass., where he moved his stock to a more commodious store at 79 North street. The new store is under the management of H. C. Whitten. In Louisville, Ky., his line of oil stoves will be handled by the O. K. Stove & Range Company.

W. Jackson's Sons, 246 Front street, New York, are furnishing 110 fire places for 11 fine residences being built by Geo. Edgar at Eighty-ninth street and Eighth avenue, New York.

The Taunton Iron Works Company of Taunton, Mass., are now running their plant four days a week and are meeting with a gratifying demand for their specialties. Among their recent shipments was a large order for Chicago.

Oscar G. Thomas of Taunton, Mass., is running his works four days a week and will increase the time as soon as business will warrant.

The Century Stove Company of Dighton, Mass., have recently resumed operations at their plant after a shut down covering a brief period.

Spence, Baggs & Co. of Martin's Ferry, Ohio, closed their works for a short time during the latter part of February, on account of the scarcity of coke.

The Richmond Stove Company of Norwich, Conn., resumed operations last week with a full force. It is stated on the authority of a local paper that this is the first time in months that the full number of employees has been at work.

The Mechanics' Foundry Company of Rockford, Ill., are busy on the patterns for three sizes of a hot air furnace which they will soon put on the market.

Schill Bros., Crestline, Ohio, owing to the gratifying success which has attended the introduction of the New Idea line of hot air furnaces, first offered the trade in 1892, have been compelled to remodel their present plant in order to obtain better and increased facilities for the production of their goods. The company will, it is said, shortly add a line of steel ranges to their productions which will embody some new and special features.

The Quick Meal Stove Company, St. Louis, Mo., advise us that the pleasant weather prevailing throughout the West during the past two weeks has served to materially increase their business. Among the recent orders secured by them, they note shipments made to Frankfort-on-the-Main, Germany, and a point in Canada.

The Marcy Stove Repair Company, 74 Beekman street, New York, are ready to furnish repairs promptly to the dealer for any stove that he will soon have orders to put in condition for the summer cooking, or the parlor stove that should be repaired before it is stored.

TRADE REPORT.

The Iron Market.

Pig Iron.—In Foundry Iron the movement in the New York market is slow. In New England some pretty good orders are coming up. The lower grades are selling at lower prices than ever in Eastern Pennsylvania. No. 2 is being pressed for sale in this market also. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

A fair demand and unchanged prices are reported from the Philadelphia Pig Iron market. Foundry Irons are comparatively steady at quoted rates, but there is a full supply and no indications of a desire on the part of consumers to make long contracts. If there should be any movement toward higher prices for Coke or Ores, it would doubtless be reflected in stronger prices for Pig Metal, but buyers seem to have no faith in an upward movement in anything, and until it becomes an accomplished fact it is hardly likely that they will abandon the attitude of indifference which they have so long maintained. Ordinary quotations are about as follows for Philadelphia rail deliveries, and from 30¢ to 50¢ less for water, or at points such as York, Harrisburg, &c.:

Standard No. 1 Foundry X	$12.00 to $12.50
Standard No. 2 Foundry X	11.00 to 11.50
No. 2 Plain	10.75 to 11.00
No. 1 Soft	11.50 to 11.75
No. 2 Soft	10.75 to 11.00

A distinct improvement is noted in the demand for local Pig Iron in the Chicago district. Sales have been more numerous and the inquiry is expanding. A noticeable improvement is referred to in the tone of foundrymen in this vicinity. Sales of Southern Coke Iron have also been larger, but are almost entirely confined to Soft brands. Inquiries are good, and better buying seems promised for the immediate future. Lake Superior Charcoal has also sold more largely than for some time, although transactions are still confined to small lots. Quotations are as follows for cash:

Lake Superior Charcoal	$13.00 to $13.50
Local Coke Foundry, No. 1	10.25 to 10.50
Local Coke Foundry, No. 2	9.75 to 10.00
Local Coke Foundry, No. 3	9.50 to 9.75
Local Scotch No. 1	10.25 to 10.50
Ohio Strong Softeners, No. 1	12.50 to 13.00
Southern Silvery, No. 1	11.50 to 11.75
Southern Silvery, No. 2	11.25 to 11.50
Southern Coke, No. 2	10.00 to 10.25
Southern Coke, No. 3	9.50 to 9.75
Southern, No. 1, Soft	10.00 to 10.25
Southern, No. 2, Soft	9.50 to 9.75

In the Pittsburgh market the heavy purchases of Bessemer last week have been followed by a lull, and a light demand is looked for for some time. Foundry Irons continue in very moderate demand. Quotations are given as follows for cash:

No. 1 Foundry	$10.50 to $10.65
No. 2 Foundry	9.65 to 9.75

Beyond the large contracts for Pig Iron placed in the Cincinnati market last week, a fair volume of business is reported, aggregating about 2000 tons per day. Among the buyers have been agricultural implement makers, Stove and general founders, rolling mills, pipe works and manufacturers of specialties such as radiators. Many large contracts for Pipe are pending, and several important contracts have alresdy been placed by Eastern cities at prices even less than were current a year ago, but this fact is justified by the lower prices ruling for Pig Iron. A heavy buying movement of No. 3 Foundry and Soft Irons is anticipated soon, to cover Pipe contracts placed and pending. All in all, there is a more encouraging feeling and a better outlook. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.00 to 9.25
Southern Coke, No. 3	8.50 to 8.75
Ohio Soft Stone Coal, No. 1	14.50 to 15.00
Ohio Soft Stone Coal, No. 2	14.00 to 14.50
Lake Superior Coke, No. 1	11.75 to 12.25
Lake Superior Coke, No. 2	10.75 to 11.50
Hanging Rock Charcoal, No. 1	16.00 to 16.50
Hanging Rock Charcoal, No. 2	15.50 to 16.00
Tennessee Charcoal, No. 1	13.00 to 13.50
Tennessee Charcoal, No. 2	12.00 to 12.50

The St. Louis Pig Iron market is reported as extremely quiet, and sales do not cover anything but small lots. The only sale of consequence during the past week was 600 tons of No. 2 Foundry, sold to a local consumer, the price of which is reported to have been on the basis of $6.60, f.o.b. cars Birmingham. This price is 15¢ ℔ ton less than the ruling price of this grade, and shows how anxious some furnaces are for business. It is only fair to state that other furnaces refused to quote less than $6.75, and of course these prices were not considered. The impression is gaining ground, however, that the weaker furnaces have their order books fairly well filled and will soon cease to be a disturbing factor in the market. The consumption shows a gradual increase, and consumers show no disposition to order shipments withheld. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.00 to $10.25
Southern Coke, No. 2 Foundry	9.50 to 9.75
Southern Coke, No. 3 Foundry	9.00 to 9.25
Southern Car Wheel	16.00 to 16.50

Sales of Pig Iron in the Birmingham, Ala., district are reported as showing a very material improvement; in one instance between 20,000 and 25,000 tons are reported as the sales for the past week. One sale of 10,000 tons this week. The general feeling is that these large sales will stiffen the market, especially if this week indicates a continuance of them. Stocks still show some increase, though the effect of these sales will probably be to reduce them before the end of the month. Demand for prompt shipment is very urgent in some instances, indicating lack of stocks in consumers' hands. Quotations are as follows: No. 1 Foundry, $7.50 @ $8; No. 2 Foundry, $6.75 @ $7; No. 3 Foundry, $6.50; No. 1 Soft, $7; No. 2 Soft, $6.50 @ $6.75.

THE CLEANER MFG. COMPANY of St. Louis, Mo., were chartered last week, with a paid-up capital of $5000, for the purpose of manufacturing and dealing in polishes and cleaners for metals.

Metal Market.

Pig Tin.—During the week wholesale prices advanced 0.10¢ @ 0.15¢ and subsequently receded to about the starting point. The rise was due partly to a measure of confidence brought about by the smaller shipments from the Straits during the last half of February and consequent reduction in the visible supply for Europe and America. The turn downward seemed to have been somewhat in the nature of a natural reaction, assisted more or less by free selling on the part of "bear" operators, who made the most of the opportunity when the market looked strongest, and applied pressure upon "bullish" sentiment moderating. Meanwhile contracts involving considerable Tin, chiefly deliveries from March to July inclusive, were dealt in, and a liberal amount of actual Tin for prompt delivery changed hands, the greater portion of which soon passed into the possession of jobbers and consumers. Apart from the decrease in the visible supply, there is no change in the situation. Stocks here and in London are still quite heavy, and, together with the quantity afloat, assure ample supplies, if, indeed, not a weighty surplus, for some time to come. Straits Pig in small parcels at 14½¢ @ 15¢ ℔ lb. Bars fetch about 1¢ advance on these prices. The consumptive demand continues fair.

Copper.—There has been another fall in prices all along the line, a result of more or less sharp competition for orders. On the decline home consumers have purchased somewhat liberally, but not on a large scale. Some export business has been marked, chiefly for the Continent, but not enough to counteract the natural influence of present heavy output of the mines. Upon the whole, the market may properly be described as unsettled and weak. Jobbing business has been merely of a routine character. The price of small lots of Lake Ingot from store is about 10½¢ ℔ lb. Exports from this country in January, as per Bureau of Statistics returns, were 5290 tons Ingots, Bars, &c., and the equivalent of 1363 tons fine Copper in Matte.

Sheet Copper.—In its general features the market shows no variation from the conditi on noted in our last report. Consumption is still below the average, yet a larger volume of inquiry seems to indicate the existence of a better feeling among buyers. Small lots of Sheet Copper are quoted by jobbers at the net list price, 14¢ ℔ lb.

Pig Lead.—The condition of the wholesale market is practically the same as it was a week ago. No change to speak of has taken place during the interval. Transactions involving more than a few carloads have been strictly the exception, and inquiries have afforded no indica tion of change in the fo rmer policy of consumers under which pu rchases were restricted as much as pos sible to actual needs. Prices are wea kish, although no quotable change has occurred. American Pig in small

lots from store is quoted 3⅞¢ @ 3½¢ ℔ lb.

Spelter.—Small orders have been more numerous than for some time past and have resulted in a very fair business being done. Some improvement is noted in the tone of the market also. Reliable Western brands, in small parcels, are quoted by jobbers at 3¾¢ @ 4¢ ℔ lb from store, but inferior stock can be secured at a shade less.

Antimony.—In jobbing quantities a fair business has been done. For small quantities the ruling quotations are 8¢ for Hallett's and 9¼¢ for Cookson's.

Nickel.—Sellers quote at 35¢ @ 40¢, according to size of lot.

Tin Plate.—Business has been surprisingly light, except for a somewhat spasmodic activity in Cokes for both spot and future delivery, to supply the current needs of can makers. Yet even this class of consumers shows comparatively little interest in purchasing, their demands being still away below the average for the season. The prices at which some of this business has been closed are reported to have been extraordinarily low. The reported suspension of work at various foreign mills and reduced output at others has failed to enliven buying interest in the slightest degree, and does not appear as yet to have curtailed the offering. Nor does the fact of exceptionally low prices seem to offer any inducement to consumers to stock up. These conditions alone serve to keep the market in a remarkable state of weakness, and, in addition, where necessary to retain or secure custom, American manufacturers have met foreign prices, thus adding to the demoralization of the market. In some instances, it is said, prices made on American Plates have been actually lower than those quoted for foreign stock of like character. In other cases, imported Plates are reported to have been sold at a lower price than the lowest at which they could be imported. March has not so far shown any ground for solid encouragement to the Tin Plate trade at large.

The condition of the British Tin Plate market is thus described in a special London cable dispatch of March 5 to *The Iron Age:* Tin Plate is unchanged. Limits from America check business, being very low. Board controlling 391 mills held a meeting on Thursday, and decided to decrease the make by one-third at each mill. The Ashburnham works have restarted. Stocks at shipping point about 247,000 boxes, in the face of further decrease in mills. Quotations, f.o.b. Wales, are as follows:

Bessemer Cokes, IC 14 x 20	9/	@	.....
Siemens Cokes, IC 14 x 20	9/3	@	9/4½
Ternes, 20 x 28	18/	@	23/
Charcoals, IC 14 x 20	10/6	@	13/

Sheet Iron.—The volume of business in both Black and Galvanized Sheets has increased considerably and some large orders have been placed with mills up to July 1. Jobbers' quotations for small lots of No. 27 Common Iron from store rule at about 2.65¢. Galvanized Sheets in similar quantities are quoted at the discount of 75 and 5 % @ 75 and 10 % off.

Chicago Report.

Scrap.—Wrought Scrap of best grades has been in fair demand, but cheap qualities are neglected. Cast is in light supply with a good inquiry. Heavy Steel Scrap is doing well. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3 00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	...	2¼¢
Rubber	..	4 ¢

Anthracite.—Only a fair trade is reported by dealers. Carload lots of 12 net tons or over are quoted as follows, although some concessions are now being made:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8.10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

CONDITION OF THE

Hardware Trade.

WITH THE OPENING of spring, according to the calendar, and the advance of the season and the coming of more moderate and warmer weather, there is a quickening in trade and a more active preparation for the business which is expected during the next few months. Seasonable goods are in especial demand, and there is on the whole little complaint to be made in regard to the volume of trade in this line. There are also indications that in Builders' Hardware trade will be at least fair, but with the large production of goods there is much competition for such orders as are going. Carpenters' and Mechanics' Tools are receiving their share of attention, and it is thought that business in this class of goods will be better than last year, but in some of them prices, though confessedly very low, are more or less irregular. In heavy goods, on the other hand, there is a slightly firmer feeling, and in some cases extreme figures have been withdrawn. The trade are anxiously awaiting the time when there will be satisfactory indications of a general stiffening in the market, but as yet this is not the case. Merchants are taking the view that careful buying is the correct policy and are placing their orders for only such goods as are necessary, and manufacturers are called upon by their larger and smaller customers to carry stocks from which goods can promptly be furnished on rush orders. At the same time manufacturers are endeavoring to avoid undue accumulation of stock on account of their past experience in connection with the decline of prices. It is probable, therefore, that the stocks of goods in the hands of both manufacturers and jobbers are considerably lighter than usual.

Advices from Chicago.—Better weather has rejoiced the hearts of Shelf Hardware jobbers, as it has brought with it a largely increased demand for goods. A strong symptom of the better condition of trade throughout the country is shown in the recent buying of new stocks. Quite a number of new Hardware firms have made arrangements to start at various points in the West, and have bought stocks in this jobbing center during the past two weeks. Regular demand from the trade also appears to be more general, covering almost all lines of goods, showing that the country is extremely bare of stocks. Those ordering in small quantities are usually the most clamorous for prompt shipments. The only kind of goods now neglected is Builders' Hardware, but the building season has not opened throughout the country. This branch of trade may be expected to continue dull for some time to come. The demand for Tinware has fallen off considerably, although within the past day or two orders again showed a tendency to increase. Collections have recently been somewhat better.

Notes on Prices.

Wire Nails.—A fair but not especially heavy volume of business is being done by the manufacturers, who are, however, well supplied with orders and refer to the situation as satisfactory, with indications of a good steady business during the season. Their prices are firmly maintained. The prices at which a few jobbing houses are offering Nails purchased before the recent advance have apparently had comparatively little effect on the market as a whole, the trade understanding pretty well the circumstances which induce this cutting in prices.

Advices from Chicago.—Manufacturers almost invariably report a quiet week, but as they are well fixed for orders they are not anxious about the situation, especially as stocks are moving a little better from the hands of jobbers, who are enjoying a much better trade. The same irregularity in their prices continues as previously reported. Quotations range from 95 cents to $1.05, Chicago, yet those who are making the outside figures report an excellent movement in small lots, which is fully as large as in previous seasons.

Cut Nails.—There is little new in the Cut Nail market. Prices for small lots from store are steadily held at 85 to 90 cents. The volume of business is comparatively small.

Advices from Chicago.—Manufacturers report trade still quiet. Jobbers quote small lots from stock at $1.

Barb Wire.—An improved demand is reported for Barb Wire and the manufacturers refer to the situation as on the whole a very satisfactory one. Prices are well maintained by the manufacturers on the basis of $1.90 for carload lots of Four-Point Galvanized at mill. Some leading jobbers continue, however, to undersell the manufacturers, thus producing some irregularity

in current prices. The general tone of the market is, however, well maintained. Small lots from stock in New York are quoted at $1.65 for the Painted and $2 for the Galvanized.

Advices from Chicago.—The time is now close at hand when the jobbing trade of the West and Northwest must buy actively. So far they have purchased sparingly, but the advent of March means a different condition of trade. Farmers will be able very speedily to resume outdoor work. Manufacturers have been able so far to avoid much accumulation of stock, owing to the orders taken in December and January. They are confident that from the present outlook the month of March will see them running to their full capacity, and unable to make prompt shipments. Small lots from stock are moving a little more freely at $1.65 for Painted and $2 for Galvanized.

The Yankee Sprinkler.—Cleveland Lock Company, Cleveland, Ohio, manufacturers of the Yankee Sprinkler, which was illustrated in our issue March 2, are selling it to the trade at $4.25 per dozen, japanned, and $4.50 per dozen, galvanized, complete with washer and 20 feet of cotton cord, one Sprinkler in a box.

Mop Wringer.—The T. I. C. Mop Wringer, illustrated in *The Metal Worker* of the 16th ult., and put on the market by the Torrance Iron Company, Troy, N. Y., is sold to the trade at $5 per dozen, a discount of 10 per cent. being allowed on orders of one gross and over.

S. & W. Drilling Attachment.—The Smith & Winchester Company, Boston, Mass., are putting on the market the S. & W. Drilling Attachment for drilling metals. The drills are made in two styles, for use with round and square shank drills. The former style, A, is sold at $1.75, and the latter style, B, is sold at $2.50 apiece.

Cordage.—There is but little change in the prices ruling for Cordage, but something of an increased demand is perceptible. Quotations for large lots, f.o.b. factory or New York, are as follows, subject to a discount of 1½ per cent. for cash:

	Cents.
Manila, base	7 to 7¼
Sisal, base	4 to 7¼
New Zealand, base	4 to 7¼

Red Lead.—About the average sales of domestic have been made and the market remains steady, being free from serious disturbing influences. Foreign has remained quiet, with buyers showing no interest except in small lots for immediate delivery. Prices have undergone no change.

White Lead.—Distribution of dry White Lead in small quantities has increased somewhat, and there has been a much freer trade in Lead in Oil also. Prices generally have remained stationary, but indirect concessions are made by jobbers where such inducements tend to help the sale of other of their goods. Competition is keen.

Screws.—The Screw market, as the trade are aware, has for some time been in a somewhat unsettled condition, the manufacturers' printed discounts not representing at all closely the prices at which the goods have been selling. In order to correct this condition of things discount sheets have been issued by American Screw Company and Russell & Erwin Mfg. Company, under date of March 1, naming a discount of 87½ and 10 per cent. on Flat Head Iron Screws, with corresponding changes in the prices of other leading kinds. The present discounts on Screws are accordingly as follows:

	Per cent.
Iron, Bright, Flat Head	87½ and 10
" " Round and Oval Head	82½ and 10
" Blued, Flat Head (add 5 per cent. to net amount of invoice)	87½ and 10
Iron, Blued, Round Head	82½ and 10
" Japanned, Flat Head	75
" " Round Head	70
" Tinned, Flat Head	75
" " Round Head	70
" Lacquered, Flat Head	65
" " Round Head	60
" Bronzed, Flat Head	65
" " Round Head	60
" Brass Plated, Flat Head	65
" " " Round Head	60
" Copper Plated, Flat Head	65
" " " Round Head	60
" Nickel Plated, Flat Head, Burnished	75
" " " Round Head, "	72½
" Silver Plated, Flat Head, "	50
" " " Round Head, "	50
Brass, Flat Head	87½ and 10
" Round and Oval Head	82½ and 10
" Lacquered, Flat Head	65
" " Round Head	60
" Bronzed, Flat Head	65
" " Round Head	60
" Silver Plat'd, Flat Head, Burnished	50
" " " Round Head, "	50
" Nickel Plated, Flat Head, Burnished	66⅔ and 6
Brass, Nickel Plated, Round Head, burnished	66⅔
Copper, Flat Head	65
" Round Head	60
Bronze, Flat Head	82½ and 10
" Round Head	80 and 10
Phosphor Bronze, Flat Head	60
" " Round Head	55

In their discount sheet announcing the above prices the American Screw Company, Providence, R. I., also quote a discount of 87½ per cent. on their Rogers' Drive Screws, and give their present prices on Machine Screws, Bolts, Rivets and miscellaneous goods, and the Russell & Erwin Mfg. Company, New Britain, Conn., and New York in announcing the above prices, give the following discounts on their Diamond Point Steel Screws:

	Per cent.
Oval Head	87½ and 10 and 10
Flat Head	87½ and 10
Round Head	82½ and 10

They also give lists and discounts applying to Stove Bolts, Sleigh Shoe Bolts, Steel Wire Nails, Steel Wire Brads, Steel Wire Carpet Nails, Brass Escutcheon Pins, &c.

A. L. Swett Iron Works.—The following are the present prices of the goods manufactured by the A. L. Swett Iron Works, Medina, N. Y., the discounts applying to the lists given in their recent catalogue:

	Per cent.
Pilot Door Hangers	60
New Perfection Hangers	60 and 10 and 10
Samson Hangers	60 and 10
Hamilton "	60 and 10
Orleans "	60
U. S. "	70
Flange "	70 and 10
Rider Wooster Hangers	70
Champion Hangers	70
Check Back "	75 and 5
Offset Hangers	75 and 5
Western Pattern Hangers	75 and 5
Climax Hangers	55 and 10
Acme Bottom Rollers	55 and 10
No. 1 L Cast Rail, per 100 feet	$1.25
No. 2 Hy. " " "	1.75
No. 3 D. F. " " "	1.50
No. 4 " " "	1.50
No. 5 Flat " " "	1.75
No. 0 Steel Rail " "	2.75
No. 4 P. L. B Steel Rail, per 100 feet	2.75
No. 2 Steel Rail, per 100 feet	3.75
No. 1 " " with lag screws, per 100 feet	3.75
No. 1 Steel Rail, without lag screws, per 100 feet	3.00
Hinge Adjustable Stay Rollers, per doz.	.85
Screw and Spike " "	.60
Floor Stay Rollers, per doz	.60
	Per cent.
Door Pulls	75
Yankee Door Catches	60 and 10
Revolving Clothes Irons	70 and 10
Barrel Headers	50 and 10
Chain Pump Curbs, per doz	$18.00
" " Tubing, per foot	.03
Galvanized Pump Chain, per pound	.07
	Per cent.
Rubber Buckets	60
Chain Pump Castings	60 and 10
Wood " "	40
Novelty Tackle Blocks	50
Hay Fork Pulleys	40
Floor Hooks	60 and 10
Saw Vises	50
Blacksmith Drills	70
Tire Benders	60 and 10
" Shrinkers	60
Tuyere Irons	75
Swage Blocks, per pound	$0.02¼
Mandrels or Cones, per pound	.03
Bolster Plates, per pound	.02¼
Bob Rockers, " "	.02¼
Wagon Shoes, " "	.02¼
Rub Irons, " "	.02¼
Oil Troughs	60
Sleigh Shoes, per pound	$0.03
Cast Washers, " "	.03
Washer Cutters	Per cent. 60
Handled Mauls, per pound	$0.02½
Mauls, without handles, per pound	.02
Horse Hitching Weights, " "	.02¼
Dumb Bells, per pound	.03
Quoits	40
Boot Jacks	50
Jack Screws	75
Post Caps	50
Stove Shelves	50
Gem Pans	50
Dirt and Sod Tampers	40
Grate Bars, per pound	$0.03
	Per cent.
Corner Hay Racks	60 and 10
" Mangers	70
Slow Feed Corner Mangers	33⅓
Stable Cesspools	50
Cesspool Grates	60
Sewer Grates	60
" Castings	20

CONTENTS.

	PAGE
Editorials:	
Quality of Tin Roofs	29
The Kitchen of the Future	29
Sanitary Aspects	29
Some American Kitchens	29
The Letter Box—	
Cold Air Box and Filter	30
Why Did It Collapse?	30
A Few Remarks on Ventilating and Cold Air Supply for Hot Air Furnaces	30
Wants Cement for Marble and Basins	30
Frozen Wind Mill Tanks	30
Wants to Remove Letters from Glass	30
Heating from Range	30
A Peculiar Furnace Experience. Illus.	31
A Roof Problem	31
Will It Work?	31
Arrangement of Hardware Store. Ill.	32
The Quality of Tin Roofs	32
Lining Slate Tank	32
Rimmed Covers for Coffee Pots	32
The Retail Store—	
The Eclipse Gas Stove. Illustrated	33
Covert Snaps. Illustrated	33
Memoranda	33
Steam and Hot Water—	
Combination Heating.—IV. Illus.	34
The Ornate Radiator. Illustrated	36
Problem for an Engineer. Illustrated.	36
A Pipe Fitting Question	36
The Nichols Tap and Reamer Wrench. Illustrated	37
Tests of Non-Conducting Pipe Coverings	37
Heating Notes	37
New York State Steam Fitters	38
Heating and Plumbing—New Work and Contracts	38
Roofing and Cornice—	
Conductor Heads.—III. Illustrated	39
Folsom's New Model Roof Snow Guard. Illustrated	40
Flashings	41
Vanderman's Steel Tool Chest. Illus.	41
Rivet Heater. Illustrated	41
Tin Plates—	
The Black Plate Mills	42
Scrap	42
Trade Notes	43
Plumbing and Gas Fitting	
Association News:	
New York State Plumbers	44
Ohio State Plumbers	44
Chicago Apprenticeship Code	45
Lead Lined Iron Pipe. Illustrated	45
Salvage Closet Connection. Illus.	46
The Star Couplers on Supply Pipes. Illustrated	46
Traps and Vents	46
Stove Trade Notes—	
The Local Stove Trade	48
The Ohio Stove Trade	48
The Manufacture and Sale of Warm Air Furnaces from New York State and Its Effects on the Heating Stove Trade	48
Odd Plates	50
Trade Report—	
The Iron Market	51
Metal Market	51
Chicago Report	52
Condition of the Hardware Trade	52
Notes on Prices	52
Metal and Miscellaneous Prices	54
Labor Exchange	
Help and Situations Wanted	56

Metal and Miscellaneous Prices.

CHICAGO, MARCH 7, 1895.

Tin—

Straits pigs .....15¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 26.50
	DC, 12⅛ x 17	@ 5.50
	DX, 12⅛ x 17	@ 7.25
Allaway Grade,	IC, 10 x 14	@ 5.12½
	IC, 12 x 12	@ 5.12½
	IC, 14 x 20	@ 5.12½
	IC, 20 x 28	@ 10.25
	IX, 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC. 10x14.14x20	@ $4.75
IC, 14x20.90 lb	@ 4.25
IC, 14x20. 100 lb	4.50
10 x 20	7.00
20 x 28	9.50
IX, 10x 14, 14 x 20	@ 6.00
B.V. Grade. IC,10x14. 14x20	@ ....

Charcoal Plates.—Terne

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $4.75
20 x 28	@ 9.50
IX. 20 x 28	@ 12.00
Worcester Brand and equal.—	
IC. 14 x 20	@ 5.25
IC, 20 x 28	10.00 @ 10.50
IX, 14 x 20	6.25 @ 6.50
20 x 28	12.50 @ 13.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56		$12.50
XX, 14 x 56	25.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.25
IX, 10 x 14, 12 x 12, 14 x 20. 6.50

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.50
IX, 10 x 14, 12 x 12, 14 x 20. 7.00

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.00
IX, 10 x 14, 12 x 12. 14 x 20.. 7.50

Usual extra or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20 ..... $6.25
IX, full weight, 14 x 20 ..... 8.00

Irondale A A:

IC, full weight, 14 x 20 ..... 5.25
IX, full weight, 14 x 20 ..... 6.75

Irondale A:

IC, full weight, 14 x 20 ..... 5.00

Irondale B:

IC, 100 lbs., 14 x 20 ..... 4.25
IC, full weight, 14 x 20 ..... 5.00

Irondale C, IC, 14 x 20, 100 lbs. 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $4.75
Old Hundred, IC, 14 x 20, 100 lbs.... 4.50
R. W. & B., IC, 20 x 28, 216 lbs..... 9.50
Old Hundred, IC, 20 x 28, 200 lbs.... 9.00

Roofing Plates.

Palm, IC, 20 x 28 ..... @ $10.00
Palm, IX, 20 x 28 ..... @ 12.00
Empire, IC, 20 x 28 ..... @ 10.75
Empire, IX, 20 x 28 ..... @ ....
Hickory, IC, 20 x 28 ..... @ 11.50
" IX, 20 x 28 ..... @ 14.00
Alaska (heavily coated), IC, 20x28 @ 13.00
Alaska IX, 20 x 28 ..... @ 16.00
Special, IC, 20 x 28 ..... @ 13.00
" IX, 20 x 28 ..... @ 16.00
Niagara, IC, 20 x 28 ..... 9.50
Iroquois, IC, 20 x 28 ..... 9.00
Westmoreland:
IC, 14 x 20 ..... 5.25
IC, 20 x 28 ..... 10.50
IX, 14 x 20 ..... 6.50
IX, 20 x 28 ..... 13.00
Kenwood.
IC, 14 x 20 ..... 5.00
IC, 20 x 28 ..... 10.00
Furmston:
IC, 14 x 20 ..... 4.75
IC, 20 x 28 ..... 9.50
IX, 20 x 28 ..... 12.00
Irondale AA, IC, 14 x 20 ..... 5.75
Irondale A, IC, 20 x 28 ..... 10.50
Irondale B, IC, 20 x 28 ..... 10.00
Each extra cross $1.50.
Challenge, IC, 20 x 28 ..... 10.50
Juno:
IC, 14 x 20 ....
IC, 20 x 28 ....
Illinois, Old Method:
IC, 20 x 28 ..... 13.50
IX, 20 x 28 ..... 16.50
E. L.:
IC, 20 x 28 ..... 10.75
IX, 20 x 28 ..... 13.25
Jessie:
IC, 20 x 28 ..... 10.25
Old Process:
IC, 14 x 20 ..... 8.00
IX, 14 x 20 ..... 9.50
IC, 20 x 28 ..... 16.00
IX, 20 x 28 ..... 19.00
H. B. L., Old Style:
IC, 14 x 20 ..... 7.00
IX, 14 x 20 ..... 8.25
IC, 20 x 28 ..... 14.00
IX, 20 x 28 ..... 16.50
H. G. M. & Co., New Process:
IC, 14 x 20 ..... 4.50
IC, 20 x 28 ..... 9.00

Extra Fine Granite:
IC, 14 x 20 ..... 4.87½
IC, 20 x 28 ..... 9.75
IX, 20 x 28 ..... 12.25
Ravenswood:
IC, 14 x 20 ..... 5.25
IC, 20 x 28 ..... 10.50
IX, 20 x 28 ..... 13.00
H. G. M., Old Style:
IC, 14 x 20 ..... 7.00
IC, 20 x 28 ..... 14.00
IX, 20 x 28 ..... 16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.40

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 1-10¢	2.60¢
17 to 20	₩ lb 2 2-10¢	2.70¢
21 to 24	₩ lb 2 3-10¢	2.80¢
25 and 26	₩ lb 2 4-10¢	2.90¢
27	₩ lb 2 5-10¢	3.00¢

Russia, Planished, &c.

100 lbs.

Patent Planished, ₩ lb, A.....$10.20 } 10%
Patent Planished, ₩ lb. B..... 9.20 } dis
Craig's Polished Sheet Steel .....8¼¢

Galvanized.

Juniata, or first quality ..... dis. 75&10@75&10&2½%

Copper—

Ingot.

Lake.....16¾¢ @ 11 ¢
Casting Brands..... .10 ¢ @ 10¼¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)
Discount, 40%.

Slab Spelter—

Western Spelter ..... 4¢

Sheet Zinc—

600 lb casks $4.75
300 lb casks 4.95
Loose sheets 5.05

Solder—

½&½ ..... 9¾@10¢
Extra Wiping ..... 8½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson ..... 10@11¢
Hallett's ..... 9@9½¢

Lead—

Soft Pig Lead ..... 3¼¢
Bar ..... 3¾¢
Pipe ..... 6¼¢, dis 10¢
Block Tin Pipe ..... 25¢
Sheet ..... 6¢, dis 10¢

Wrought-Iron Pipe—

1¼ and under, Plain 70%
1¼ and under, Galv 64%
1½ and over, Plain 77%
1½ and over, Galv 57½%
Boiler Tubes, list Oct. 24, 1892 ..... 68%
Casing, list Nov. 16, 1892 ..... 52½%
Inserted Joints Casing, list Nov. 16, 1892 ..... 47½%
Steel Boiler Tubes 57½%
Cold Drawn Seamless Steel Tubing. 60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 5 inches, inclusive ..... dis 75&10%
Other sizes ..... dis 70%

Leader Pipes—

Abendroth's Galv. Spiral Riveted 60%
Austin's Corrugated 65%
Gordon & Gilbert's Corrugated 65%
Ritchie's (Galv. Iron only) Cor'd 65%
Ritchie's Spiral Lock Seam, Galv'd 60%
Austin's Spiral Ribbed Pipe 65%
James A. Miller Bros. (Galv'd Iron only) Corrugated 70%

Elbows—

Adjustable ..... 50&10@60%
Spiral 60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list 50%

Steel Roofing—

Perfection ..... $2.75 square
Climax ..... $2.65 square
The Lloyd Spanish Tiling ..... $4.50 square

Metallic Shingles—

Cushman's ..... $2.10 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz ..... $36.00 square
Tin ..... $9.75@$14.25 square
Steel, painted ..... $9.00 square

Drain Pipe—*Tile.*

Discount from list 70%

Paints, Oils, &c.—

Deodorized Benzine ..... 8 @ 10
Iron Paint, Bright Red ..... ₩ lb. 2 ¢
" " Brown ..... ₩ lb, 1¼¢
" " Purple ..... ₩ lb, 2½¢
" Ground in oil, B. Red ₩ lb, 6¼¢
" Ground in oil, Red.. ₩ lb, 6¼¢
" Ground in oil, Brown ₩ lb, 5½¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls ..... 60¢
Linseed Oil, Raw, in bbls ..... 58¢
Mineral Paints ..... 2@4¢
Orange Mineral ..... 8¢
Pure White Lead in Oil ..... 5¼@5¾¢
Dry White Lead in bbls ..... 4¾@5¼¢
Red Lead, American ..... 5¼@5¾¢
Red Venetian, English, dry ..... 1¼@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs ..... 7¼¢
Sipe's Japan Oil, in bbls. ₩ gal ..... 34¢
Spirits Turpentine, in bbls., ₩ gal. 38½¢
Asphaltum, Trinidad Refined, ₩ ton. $45
Tarred Felt, 1 Ply, ₩ 100 lb $1.40
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet $1.00
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet $1.25
Roofing Pitch, lb bbl. of 300 lb $2 80

NEW YORK, MARCH 8, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots ..... ₩ lb, 63¢
100-lb lots ..... ₩ lb, 60¢
Ton lots ..... ₩ lb, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots ..... ₩ lb, 60¢
100-lb lots ..... ₩ lb, 55¢
Ton lots ..... ₩ lb, 53¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots ..... ₩ lb, 55¢
100-lb lots ..... ₩ lb, 53¢
Ton lots ..... ₩ lb, 50¢

Antimony—

Cookson ..... ₩ lb, 9¼@9½¢
Hallett's ..... ₩ lb, 8 ¢

Brass—

Planished ..... net
Roll and Sheet ..... 25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ft.	
¼-in. up to 2-in.	$0.35	25 @ 30%
5/16-in. up to ¾-in.	.36	
7/16-in. up to ⅝-in.	.38	
½-in. up to ⅞-in.	.41	
5-16-in. up to ¾ in.	.43	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 19, inclusive,	.38	

Copper and Bronze Tubing—

2¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized 70%
Galvanized, Locked Joints 70%
Tin 70%

Spiral Riveted—

Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..18¢ ₩ lb, net
Ingot.
Lake ..... 10¼¢
Ansonia Grade Arizona ..... 10¼¢
Ansonia Grade Casting ..... 9¾¢
Planished ..... net
Sheet and Bolt ..... 14¢ ₩ lb, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:
Lap or Slip Joint, Galvanized 75%
Lap or Slip Joint, Terne 70%

Eave-Trough Mitres—

Lap or Slip Joint ..... list, 25%

Elbows—

Plain Adjustable—

Tin 70%
Galvanized 70%

Crimped Tubing—

Re-Tinned or Galvanized 35%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.

Tin 35%
Galvanized 35%

Corrugated.

Flat Crimp.

Galvanized 70%

Round or Square.

Tin 70%
Galvanized 70%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb 2.25	2.60¢
Nos. 17 to 21	₩ lb. 2.35	2.70¢
Nos. 22 to 24	₩ lb, 2.45	2.80¢
Nos. 25 and 26	₩ lb. 2.55	2.90¢
No. 27	₩ lb. 2.65	3.00¢
No. 28	₩ lb, 2.75	3.10¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₩ lb, 11@11½¢
Patent Planished ... ₩ lb, A, 10¢; B, 9¢. 8%
Craig Polished Sheet Steel ..... ₩ lb 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		75&5@75&10% off.
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig ..... 3½@3⅝¢
Bar ..... 4@4½¢
Pipe ..... 5¼¢ 20%
Tin Lined Pipe ..... 12½¢ 20%
Block Tin Pipe ..... 30¢ 20%
Sheet ..... 6¼¢. 20%
Old Lead in exchange, 2¾¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing 10%
Fencing, Painted Sheets 30%
Netting, Painted Sheets 30%
Door Mats, Galvanized 30%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100 @ 500 lb	5¾
Lead, Amn. White, in oil	@ 5¾
Lead, Red, hbls. and ½ hhls	@ 5¾
Lead, Red, kegs	@ 5¾
Ocher, American	@ 1½
Red Venetian, American	@ 1¾
Linseed Oil:	
Raw, ₩ gal	@ .56
Boiled	@ .59
Spirits Turpentine:	
In bbls	@ .30
Putty:	
In barrels and ½ hbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01½ @ .02½
In bladders	.01¾ @ .02½
Roofing Material, &c.:	
Asphaltum Trinidad Refined, ₩ ton	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ lb	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.	$1.85
Roofing Pitch ₩ bbl	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron. Soil—

"Standard" Pipe, 2 to 6 inches	65&10%
Fittings, Pipe, " "	65&10&10%
Extra Heavy Pipe, " "	65&10&10%
Fittings, Heavy Pipe, " "	65&10&10%
Large sizes of both kinds	65&10%
Fittings for both kinds	65&10%

Pipe, Spiral—

Galvanized.....30%
Tin.....30%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra.	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained

Rosin, O. & D.	₩ bbl. $1.49@$1.50
Rosin, E. & F.	₩ bbl. $1.55@$1.65
Rosin, G. & H.	₩ bbl. $1.75@$2.05
Rosin, I. & K.	₩ bbl $2.35@$2.55
Rosin, M. & N.	₩ bbl $2.85@$3.05

Seamless Brass Tubes..net

List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr.	$3.25@$4.50
Pen Argyle, ₩ sqr.	3.70@ 4.00
Peach Bottom, ₩ sqr.	4.75@ 5.60
No. 1 Chapman, ₩ sqr.	3.90@ 4.25
Lehigh Slates, ₩ sqr.	3.00@ 4.50

Vermont:

Sea Green, ₩ sqr.	2.50@ 2.75
Purple, ₩ sqr.	3.50@ 4.50
Unfading Green, ₩ sqr.	3.50@ 4.00
Red, ₩ sqr.	9.75@12.00

Solder and Soldering Fluids—

Solder—

½&½, guaranteed ..... 11¢
No. 1 ..... 8½@10¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.

In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
} 5 % dis.
Kegs, about 55 lb, ₩ lb.....4¢

Yager's Soldering Salts.

¼-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter..... 3¾¢@4¢
Bertha (pure)..... 7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb.....15@15½¢
Straits, pigs, ₩ lb.....14½@15¢
Straits in bars, ₩ lb.....15½@16¢

Tin Plates—

American Terne Plates—

N. B.—The following Terne Plate quotations are for 20 x 28, unless otherwise specified; 14 x 20 Plates are half the prices given below.

Alaska (re-squared) IC	$13.00
Alderly, extra quality, IC	10.75
Allegheny, IC	9.00
" IX	11.50
Anchor, IC	8.25
Apollo Roofing, IC	11.00
" " IX	13.00
Black Diamond (Extra Coated), IC	15.00
Bonus (Extra Coated), IC	11.50
" " IX	14.50
Boston, IC	12.50
Brooklyn, IC	9.00
Capitol, IC	8.50
Central, IC	9.50
Climax, IC	8.75
Columbia, IC	12.50
" IX	15 50
Columbus, IC	9.50
Dunlap's Double Dipped, IC	15.00
" " IX	17.00
" Domestic, IC	10.00
Empire, IC	10.25
Eureka, IC	9.50
" IX	12.00
Eureka, 200 lbs., IC	9.25
Excelsior, IC	9.50
Filbert, IC	14.50
Flag, IC	8.00
Florida, IC	9.50
Flusbing, IC	12.50
Freeport (Hand dipped and Resquared), IC	13.00
IX	15.50
F. R. P., Extra, IC	15.00
Globe, IC	8.50
" IX	11.00
Golden Star Old Style, IC	15.00
" " " IX	18.00
Grace, IC	8.50
Hamilton's Best Redipped, IC	15.50
" " " IX	18.50
Hickory (Resquared), IC	11.00
" " " IX	9.25
Juniati, IC	11.50
Juno, IC	11.00
Kensington, IC	13.50
" IX	16.00
Knoxall, IC	9.00
" IX	12.00
Laufman's Apollo (Resquared), IC	13.00
Laufman's Apollo (Resquared), IX	16.50
Leominster, Extra Coated, IC	11.50
Lion (Stamped), IC	11.50
Lnlu, IC	10.50
" IX	13.50
Maple, IC	11.00
" IX	14.00
Merchant's Roofing Resquared), IC	15.00
Meurer's Old Metbod, IC	15.00
Meurer Roofing, IC	14.00
National, IC	11.00
Nava, IC	10.00
" IX	12.50
New Castle Old Metbod, IC	18.00
New Castle Palm, IC	14.50
Old Colony, IC	15.00
Old Metbod, IC	13.00
" IX	16.00
Osborn's Old Process, IC	14.00
" " " IX	17.00
Osceola, Old Style, IC	14.50
" " " IX	17.50
Pennsyl Old Method (Treble Coated), IC	14.00
Phillips' Roofing, IC	14.00
Phœnix, IC	9.25
Pullman, IC	11.50
Republic, IC	9.50
Scott's Extra Coated (Resquared), IC	16.00
Scott's Extra Coated (Resquared), IX	19.00
Standard, IC	8.50
Star IC	10.50
" IX	13.00
Superior, IC	9.00
Taylor Old Style (Resquared), IC	15.00
" " " IX	18.00
The Taylor Roofing, IC	13.50
" " " IX	16.50
The Osborn Roofing, IC	11.50
" " " IX	14.00
Thomson's Puritan, IC	11.00
Tip Top, IC (Resquared)	9.75
" IX "	12.25
Triumpb, Old Style, IC	15.00
" " IX	18.00
U. S. Monongahela, IC	12.20
U. S. Redipped, IC	16.50
Venus, IC	8 25
Waldo, IC, Hand-dipped	11.50
Westmoreland, IC	12.50
Willow, IC	10.00
" IX	13.00
Zero, IC	9.00

American Bright Plates

Almond, IC, 20 x 28	$9.00
" IX, 20 x 28	11 50
Brilliant (Tissue Packed), IC 20x28	16.50
" IX, 20x28	20.00
Brooklyn, IC, 14 x 20	5.50
Century, IC, 14 x 20	5.00
Climax, IC, 14 x 20	4.75
Excelsior, IC, 14 x 20	6.50
" IX, 14 x 20	7.50
Florence, IC, 14x20	5.50
Florida, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Gladys IC, 14 x 20	4.50
Hazel, IC, 14x20	5.80
Ivy, IC, 20 x 28	12.00
" IX, 20 x 28	15.00
Linden IC, 20 x 28	10.00
" IX, 20 x 28	12.50
Mars, IC, 14 x 20	4.50
" IX, 14 x 20	5.50
Merchant's Dipped, IC, 14x20	10.00
Merlon, IC, 20 x 28	11.00
" IX, 20 x 28	14.00
Mint, IC, 20x28	8.50
" IX, 20x28	11.00
New Castle Best Palm Charcoal, IC, 14 x 20	7.00
" " IX, 14 x 20	9.00
New Castle Palm Charcoal, IC, 14 x 20	6.50
" " IX, 14 x 20	8.00
New Castle, Charcoal, IC, 14 x 20	6 25
" " IX, 14 x 20	7.50
New Castle, S. Cbarcoal, IC, 14 x 20	6.00
" " IX, 14 x 20	7.25
New Castle Palm Coke, IC, 14 x 20	5.75
" " IX, 14 x 20	6.85
New Castle Coke, IC, 14 x 20	5.50
" " IX, 14 x 20	6.50
Oak, IC, 14 x 20	4.75
Palma, IC, 14x20	6.00
Pansy, IC, 20 x 28	10.50
" IX, 20 x 28	13.00
Pbœnix, IC, 14x20	5.25
" IX, 14x20	6.50
Royal, IC, 20x28	12.00
" IX, 20x28	15.00
U. S., IC, 14x20	7.25
Versailles, IC, 14 x 20	5.75
Walnut, IC, 14 x 20	4.65
Youghlogbeny, IC, 14 x 20	6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20	$6.2
20 x 28	12.5
Pontymister Old Style Grade, IC, 14 x 20	5.56
20 x 28	11.00
IX, 14 x 20	6.50
20 x 28	18.00
Worcester Grade, IC, 14 x 20	4.50
20 x 28	9.00
IX, 14 x 20	5 75
20 x 28	11.50
Dean Grade.—IC, 14 x 20	4.25
20 x 28	8.50
IX, 14 x 20	5.50
20 x 28	11.00
Abercarne Grade.—IC, 14 x 20	4.00
20 x 28	8.00
IX, 14 x 20	5.50
20 x 28	11.00
Mansel Grade, IC, 20 x 28	8.00

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ lb.

Melyn and Calland Grade.	IC, 10 x 14	$5.25
" "	IC, 12 x 12	5.50
" "	IC, 14 x 20	5.25
" "	IC, 20 x 28	10.50
" "	IX, 10 x 14	6.50
" "	IX, 12 x 12	7.00
" "	IX, 14 x 20	6.50
" "	IX, 20 x 28	13.00
" "	DC, 12½ x 17	5.00
" "	DX, 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14	4.75
" "	IC, 12 x 12	5.00
" "	IC, 14 x 20	4 75
" "	IC, 20 x 28	9.50
" "	IX, 10 x 14	5.50
" "	IX, 12 x 12	5.75
" "	IX, 14 x 20	5.50
" "	IX, 20 x 28	1.00
" "	DC, 12½ x 17	4.25
" "	DX, 12½ x 17	5.00

Coke.

Steel Coke.—IC, 10x14, 14x20	4.25
10x20	6.50
20x28	8.50
IX, 10x14, 14x20	5.25
B. V. Grade.—IC, 10x14, 14x20	4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)	$11.50
IXX, 14x28..(112 sheets)	11.90
IXX, 14x31..(112 sheets)	13.25

Tinning—

Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—

Improved Lock Frame, per doz.	$15.00
Steel Lock Frame, per doz.	18.00
Daisy Improved Pattern, ₩ doz.	18.00

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and under, Plain	70%
1¼ and under, Galv	64%
1½ and over, Plain	77%
1½ and over, Galv	68%
Boiler Tubes	75@77½%
Screw and Socket Joint Casing	65%
Inserted Joints Casing	60%

Zinc—

600 lb casks..... ₩ lb 4¾¢
Per lb..... 5¼¢

It Is Reported—

Arkansas.

That Howard Bros., HEBER, have been succeeded by G. W. Howard.

California.

That Z. O. Johns of TULARE, formerly of HANFORD, is intending to open a Hardware store at VISALIA.

Connecticut.

That S. M. Porter & Son, BRISTOL, will open a new Hardware store shortly.

Illinois.

That S. Milliken has sold his Hardware business, at OHIO, to Mrs. Isabella Cone of WALNUT. Mr. Milliken has bought the WALNUT lumber yard, formerly owned by F. A. Brode & Co.

That Geo. Rebman has purchased the interest of Fred. J. Deuth and another partner in the Hardware firm of Deuth & Abels, at FORRESTON, and the style has become Abels & Rebman.

That, owing to continued ill health, Martin J. Peterson has sold his stock of Hardware, at CAMBRIDGE, to Julius Westerlund, formerly of OSCO.

That Calloway & Metcalf of GREENFIELD have purchased the English-Eaton Hardware Company's business at JERSEYVILLE.

That Beiersdorf & Lohsand, Stoves and Hardware, CHICAGO, have been succeeded by Edward Beiersdorf.

That E. E. Wightman, in the Hardware business at CHICAGO, has been succeeded by William H. Adderly.

That Hoge Bros., WENONA, have sold out their Hardware business.

Indiana.

That J. F. Schoenhauer of LAUD has sold his interest in the Hardware store at that place and is buying a complete new stock for a store which he will shortly open at SOUTH WHITLEY.

That George Seybold, DARLINGTON, Hardware, has been succeeded by George Seybold & Co.

That Ribison & Tinkle have opened a new Hardware store at LIBERTY CENTER.

That C. C. Nave has disposed of his interest in the Hardware firm of Dickover & Nave, HUNTINGTON, and has leased another store, where he is intending to put in a complete stock of Hardware, Stoves and Tinware.

Iowa.

That J. W. Thompson will enlarge his building, at BRITT, and add Hardware to his Agricultural Implement stock.

That M J. Kulhave has disposed of his Hardware store, at OXFORD, to O. J. Felton, who is now conducting the business.

That Frank I. Hodges, Hardware merchant, ELKADER, has been succeeded by Hodges & Kelsher.

That A. W. Seavey is about to open a new Hardware store at CORNING.

That KENDALLVILLE is to have a new Hardware store in the spring.

That Weltgenant Bros., ALGONA, have disposed of their Hardware stock to Humiston Bros. of WORTHINGTON, MINN., and the goods have been shipped to that place.

Kansas.

That O. M. Brill has traded his TOPEKA property and Hardware store for a fine hotel in GREAT BEND, which cost $28,000 to build.

Massachusetts.

That in a large fire at LYNN on the 12th ult., the Hardware store of W. Henry Hutchinson was destroyed. Mr. Hutchinson's loss was about $10,000, partly covered by insurance.

That Shumway & Riley, Stoves, &c., NORTHAMPTON, have been succeeded by J. H. & W. H. Riley.

Michigan.

That F. S. Post has sold out his Hardware store at GOBLEVILLE.

That P. H. Willert and H. J. Willert have purchased the stock of Hardware of J. C. McEntee, at ALMONT, and will continue the business under the firm style of P. H & H. J. Willert.

Minnesota.

That Brant & Erickson, Hardware merchants, CAMBRIDGE, have been succeeded by A. E. Brant.

That Soderquist & Co., Hardwaremen, BUFFALO LAKE, have dissolved. The business will be continued under the style of Soderquist Bros.

That Heaney & Peckinbaugh have disposed of their Hardware businesse, at OLIVIA, to Alfred and Arthur Heany.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

FOREMAN in malleable iron foundry; must understand how to handle men to best advantage and be able to produce high grade iron at low cost. "Malleable," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 9

SALESMAN wanted to sell tin plates as side line for Kentucky, Missouri and Northwestern States. "79," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 9

A TINSMITH by March 15; a man who understands working in country tinshop; would like man with some knowledge of plumbing and iron pipe work; must be strictly temperate; single man preferred; please address, stating wages, "Iron Pipe," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

FOREMAN for iron molders; a man competent to take charge of a molding department manufacturing stoves, furnaces and water heaters; reply by letter, giving name, age, capabilities, references. "Molder," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

A first-class FOREMAN for a metal stamping works; must understand fully about sheet metal goods and take good care of men; a good opening for right party. Fred. F. Bischoff, Libertyville, Ill. Mar. 9

An experienced TRAVELING STOVE SALESMAN. Address by mail, Detroit Stove Works, Detroit, Mich. Mar. 9

CORNICE FOREMAN.—In these times of depression and lack of business there may be some employer who has a good foreman for whom he desires procuring a first-class position, because of the fact that business has so fallen off as to render it impossible to longer retain him, at the same time feeling loath to discharge him. We have a place for a first-class foreman in a first-class cornice shop. He must be one who can estimate from architect's drawings and handle men and work; state salary now being paid and capabilities; must be sober and trustworthy in every respect. "Z. X. Y.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar 9

Manufacturer of a complete line of combination hot air and hot water furnaces; also full line of stoves and ranges, gas and oil stoves, would employ a SALESMAN on liberal commission basis for Chicago and suburbs; must be posted in furnace business; give age and references. "Commission," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 2

A Chicago manufacturer wishes services of a reliable middle aged warehouse man who is familiar with the stove and casting business and acquainted with Chicago retail stove dealers; also capable of assisting in taking orders an shipping stoves, and can read and write intelligently; give references. Box 77, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 2

A good TIN and SHEET IRON WORKER for inside and outside work; steady work and fair wages to the right man. Conley Bros. Oneida, N. Y. Mar. 2

An A1 man, who thoroughly understands gasoline goods on commission; none but first-class men need apply; a handsome profit for the right party. "G. C. H.," 88 Congress street E., Detroit, Mich. Mar. 2

I will give a good, all around TINNER an interest in my well-established business; must understand roofing, spouting, furnace work and shop work; want a man who is sober and capable of handling the entire business; no money or tools required, but must be honest and show good reference. Lock Box 241, Garrett, Ind. Mar. 2

A first-class man who can do first-class work at both steam heating and plumbing; a steady job and good pay. Geo. A. Anthum, Biddeford, Maine. Mar. 2

To sell hot water and steam boilers; must be a man having good technical knowledge of the business; must be an approved salesman, accustomed to the road, and have special knowledge and familiarity with Western trade. Gurney Heater Mfg. Company, 163 Franklin street, Boston, Mass. Mar. 2

A first-class TINNER and PLUMBER at once; steady job to right man; state wages expected. No. 16 Lock Box, Wiconisco, Pa. Mar. 2

SITUATIONS WANTED.

By a PLUMBER; four years' experience; city or country; good habits; wages $2 a day. Schilling, Olean, N. Y. Mar. 9

By a PLUMBER; six years' experience; can do all kinds of jobbing; wages moderate; steady and sober. Thomas F. Burke, Box 45, West Winsted, Conn. Mar. 9

By a HEATER and RANGE WORKER, ROOFER and GENERAL JOBBER; 18 years' experience; city or country. C. Conklin, 276 Seventh street, Jersey City, N. J. Mar. 9

By a first-class practical GALVANIZER, TINNER and RETINNER of gray cast iron-ware, malleable and wrought iron ware and tin-plate stamped ware with a brilliant coating; also capable of building the kettles; sober and reliable. Wm. Davies, 43 and 45 Lenox House, Brooklyn, N. Y. Mar. 9

A young man, aged 25, an experienced and practical BOOKKEEPER and CORRESPONDENT, competent of taking full charge of an office, desires position with some reliable house at reasonable salary; can furnish best of references and security if required; will leave city if necessary. J. W. Caughey, 722 Courtland avenue, N. Y. Mar. 9

By a first-class TINSMITH; good jobber on plumbing; city or country. C. Smulasky, 247 Monroe street, New York City. Mar. 9

By a PLUMBER: city or country; best of references. Robt. Smith, 947 Third avenue, New York City Mar. 9

By a young man, 19 years of age, now working as journeyman; three and a half years' experience at plumbing; would like a job as HELPER with a man who does first-class work. "Willing," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

By a young man 22 years of age as TIN ROOFER, CORNICE and SKYLIGHT MAKER; moderate salary; New York City preferred. T. Kesler, 88 Willett street, New York City. Mar. 9

TINSMITH; first-class mechanic in every branch of the trade; able to take charge of all kinds of work; steady job; city or country. B. Maurer, 63 Lewis street, New York City. Mar. 9

By a first-class TIN and SHEET METAL WORKER; an expert at furnace work, and thoroughly understands roofing, spouting and general all around job work; an A1 hand at bicycle repairing; understands hardware; can clerk in store; 26 years of age; speaks English and German; industrious, trustworthy and sober; steady position desired; best of references. H. F. Tinker, Barrington, Ill. Mar. 9

A gentleman of 15 years' experience in the hardware and house furnishing business is open for engagement either as MANAGER, SALESMAN or any other position of trust; best of references. "Z.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 9

By a first-class TINSMITH, COPPER and SHEET IRON WORKER (Scandinavian; speaks English and German); wants steady position; accustomed to all inside and outside work and general jobbing. A. Nendel, 307 Avenue C, New York City. Mar. 9

In the country, by a TIN and SHEET IRON WORKER; 16 years' experience. Henry Newberge, 212 Eldridge street, New York City. Mar. 9

PLUMBER. 23 years of age, wishes a good steady situation in country shop or would invest cash for half interest in grown business; honest, temperate and a fair workman. "C. G.," 14 Main street, Norwalk, Conn. Mar. 9

By an all around TINSMITH, 11 years' experience; a knowledge of furnace and iron pipe work; temperate; good reference. P. O. Box 237, Marlboro, N. Y. Mar. 9

By junior PLUMBER; city or country; steady employment desired; wages $2 per day. "Black Jack," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

By a young man of exceptional habits and ability as TINSMITH and general sheet metal worker; would like to hear from parties who would give working interest in hardware business for services and small capital. "Ambition," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

By a TINSMITH, 32 years of age; married; 14 years' experience in a country shop; understands furnace work, pumps, piping and general jobbing; country shop preferred, not keeping more than one or two men. C. M. Smith, Suncook, N. H. Mar. 9

On or before April 1, by a steady, strictly temperate and reliable TINNER; 15 years' experience at all kinds of sheet metal work; capable of putting in furnaces and giving estimates on same; can cut all my own patterns and lay out work; will guarantee satisfaction; Southern States preferred. B. Clark, 4711 State street, Chicago, Ill. Mar. 9

By a young man 23 years of age at tin roofing, spouting and guttering; a good hand at stove, range and furnace jobbing. "Tinner," 117 Liberty street, Bloomfield, N. J. Mar. 9

By a young married man who has had 18 years' experience at the tin trade, at inside and outside work, such as roofing, guttering, stove and lining work; position desired in the vicinity of Hoboken; good reference. M. Neumerkel, 408 Grand street, Hoboken, N. J. Mar. 9

After April 1, by a PLUMBER, STEAM and HOT WATER FITTER; 24 years' experience; married, sober, honest and reliable; can be depended upon at all times; would take charge of shop and do the work, or go on the road and set up work; placed 43 hot water plants last year; references exchanged. "Reliable," care G. W J., 154 West Twenty-sixth street, New York City. Mar. 9

PLUMBER, strictly first-class mechanic, desires work in city or country; neat lead worker; sober; can furnish best of reference; willing to go anywhere. James Emmett, 434 East 114th street, New York City. Mar. 9

By a PLUMBER and GAS FITTER who thoroughly understands natural gas, also sanitary work; best of reference; five years' experience; city or country; moderate wages; strictly temperate. "B. H.," 522 West Hudson street, Elmira, N. Y. Mar. 9

By a PLUMBER, GAS and STEAM FITTER; six years' experience at city and country work; good reference. "Plumber," P. O. Box 138 Norristown, Pa. Mar. 9.

Permanent position by a young man in a hardware store; six years' experience as bookkeeper and salesman; good reference; state salary; the East preferred. A. J. Volkman, 756 W. Washington street, Jackson, Mich. Mar. 9

Steady job by a TINSMITH, at inside or outside work; city or country. "Tinsmith," Cold Spring, Putnam County, N. Y. Mar. 9

As BOOKKEEPER by a thoroughly experienced man 31 years of age; can furnish highest refcrences. "Bookkeeper," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

About May 1, by a competent TINSMITH and SHEET IRON WORKER proficient in all branches; can do a good job of plumbing, steam or gas piping, make close estimates from plans, lay out and plan any job in the above lines; would like position with good parties to take charge of the mechanical part of the business, to do the estimating, &c.; six years' country and 14 years' city experience; American; married; strictly honest and temperate; best of reference; small town or city near salt water preferred. "A. T. V.," 68 West Seventy-first street, New York City. Mar. 9

By a young man 22 years of age; three and a half years' experience in a country shop at general jobbing and piping. R. L. Dillon, Le Roy, N. Y. Mar. 9

As SALESMAN or ENGINEER with manufacturer of house heating boilers or firm of steam and water contractors; am thoroughly familiar with the sale and introduction of steam and hot water apparatus; also have over 200 jobs of steam and hot water in successful operation; can make working drawings and lay out work; also familiar with the fan system of heating and ventilation. "Applicant," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

By a young man 23 years of age, five years' experience in a country shop; can do furnace work, piping and general jobbing; strictly temperate. Wallace M. Aiken, LeRoy, N. Y. Mar. 9

By a young man (25), with eight years' practical experience in the stove and heater business; good typewriter and understands bookkeeping; not afraid of hard work; best of references. "B. B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2

By a STOVE IRON PATTERN FITTER capable of taking charge of iron fitting shop and competent of doing correct work. "Stove Fitter," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2.

By a practical CORNICE and SKYLIGHT MAKER; first-class cutter and draftsman; understands estimating on work; capable of taking charge of shop and handling any number of men; can do all classes of hammer and raising work by hand; steady position; moderate wages; would take charge of shop or work at the bench; New York City or Brooklyn preferred. "J. C. T.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 2

BY TINSMITH and GENERAL WORKER, at inside and outside work; city or country; fair knowledge of plumbing and steam fitting; best of references. Benj. W. Roberts, Box 467, Seymour, Conn. Mar. 2

Special Notices.

WANTED.

One Lyon, Conklin & Co. Patented Roofing Seamer.
One 8 inch Cornice Brake that will form 16 and 18 Galvanized Iron.
One Gang Power Punch, for heavy iron work.
The above must be in good condition and cheap.

E. BARROTT & SON,
Lawrenceburgh, Ind.

FOR SALE.

A well selected stock of Hardware in a live Pennsylvania lumber town. Stock inventories $2500. Sales last year were over $14,000. No other hardware store or tin shop within 18 miles. The best of reasons for selling. Address

"BALLINTINE,"
Lamont, N. Y.

FOR SALE.

The proprietor of a well equipped Stove Foundry, being engaged in another business to which he is required to give most of his time, desires to dispose of the foundry. Melting capacity, nine tons. Very favorably situated as to supply of material and labor and with splendid facilities for distributing to any section of the country. Address "FOUNDRY," Box 39, office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

A rare chance to buy a paying Stove and Tinware store in a finely located New England town. Have a good Steam Fitting, Plumbing, Tin and Sheet Iron trade. Good reasons for selling. Address

"RARE CHANCE,"
office of *The Metal Worker*, 96-102 Reade St., New York.

TO JAPANWARE MANUFACTURERS.—A patentee is desirous of arranging with some firm or firms to manufacture (in japanned tinware) and sell on royalty throughout the States a newly patented article of domestic use, which has met with great success in England, Good references will be required. "MALLETT," 4 Windsor Road, Southend, England.

WANTED.

Line Hard Coal Base Burner for season '95 by stove manufacturing company not making them, to handle in connection with their own, who thoroughly and actively canvass the territory of Ohio, Indiana, Michigan, Illinois and Wisconsin. Address

"HARD COAL,"
office of *The Metal Worker*, 96-102 Reade St., New York.

WANTED.

One second hand No. 2 Moore's Double Seamer, also one Bell Edger. Both must be in good condition. State price. Address A. WATSON, East Liverpool, Ohio.

MECHANIC WITH 26 YEARS' EXPERIENCE in Tin business, understands boilers, machinery, drawing, stamping, drop forging, tinning and galvanizing, practical man, inventor of tools and machinery, wants position as superintendent. First-class references. Address "MECHANIC," office of *The Metal Worker*, 59 Dearborn St., Chicago.

FOR SALE.

No. 7 Sturtevant Blower, only short time in use. Address

EUGENE MUNSELL & CO.,
218 Water St., New York.

FOR SALE.

Cast Iron Patterns of Furnaces, Ranges and Fire Place Heaters as follows: 11 sizes Furnaces, 4 sizes Ranges, 1 size Fire Place Heater. Address

ALVA HUBBARD & CO.,
Baltimore, Md.

WANTED.

To open correspondence with parties in Chicago or West who can handle Hot Air Furnaces and Hot Water Heaters in carload lots. Goods of Eastern manufacturer and well known. Address

"HOT AIR,"
office of *The Metal Worker*, 96-102 Reade St., New York.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish 3 to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

Special Notices.

FOR SALE.

25 Bxs. IC Roof. 14 x 20 Dean, slightly wet ..... $3.25 per box.
2656 feet 7 x 96 IX Terne Eave Trough ..... 4 ¢ per foot.
3400 feet 8 x 96 IX Terne Eave Trough ..... 4¾ " " "
918 feet 4 x 72 IC Terne Eave Trough ..... 2½ " " "
252 feet 4 x 56 IC Terne Eave Trough ..... 2½ " " "
60 feet 4 x 56 IC Bright Eave Trough ..... 3 " " "
144 feet 4 x 96 Galvanized Gutter, Style "F" ..... 7 " " "
180 feet 96 in. Galvanized Gutter, Style "K," 24 inch sheet ..... 16 " " "
14 dozen 4 inch Tin Spouting Elbows ..... 75 " " doz.
7 4 inch Tin Richmond Cut Offs 35 " each.
1 48 " Star Ventilator $63.00
1 2 " IXL " ..... 30 "
3 3 " " Ventilators ..... 45 " each.
5 4 " " " ..... 50 " "

BRADBEER COWLS.

2 - 3 - 4 - 5 - 6 - 9 - 10 - 12 inch
3 - 4 - 9 - 3 - 6 - 4 - 2 - 2 at ..... List less 80%

STEPHEN'S CHIMNEY TOPS.

1 each 4 - 4½ - 5½ - 6 - 8 - 9 - 10 - 12 in. List less 80%
27 6 inch Galvanized Chimney Tops 40¢ each.

RICHMOND HANGERS.

3½ - 4 - 4½ - 5 - 5½ - 6 inch
1 - 1¼ - 2 - 2½ - 1 - 1 gross, at ... List less 25%
16 pair Punches for Richmond Hangers 25¢ each less 25%.
861 lbs. Drip Pans, assorted sizes ..... 4¢ per lb.

SECOND-HAND MACHINES.

1 No. 1 Small Turning Machine, wood standard $2 00
1 No. 1 Large Turning Machine, wood standard 3.00
1 No. 1 Setting Down Machine, wood standard ..... .50
1 No. 1 Beader, less wood stand 10.00
1 No. 2 " with " " 8.00
1 No. 2 " complete 15 00
1 No. 3 " 1 pair rolls 8.00
1 No 5 " complete 8.00
1 Stow's 30-inch Sheet Iron Folder 3.00
3 Wiring Machines, with wood stand 2.00 each.
2 Common Standards ..... .25 "
1 S. P. Former, 30-inch, 1¾ rolls 7.00
1 Double Gear Breast Drill ..... .75
1 pair No 0 Bench Shears 3.50
1 " No. 3 " " 2 50
1 " No. 4 " " 1.50
1 No. 1 Savage's Patent Rotary Shear, with Burring attachment 12.00
1 20-inch Improved Grooving Machine 10 00
1 20 inch Grooving Machine 3.00
1 No. 1 Raising Hammer ..... .75
1 No. 2 Solid Mandrel Stake 2.00
1 Common Square Head Stake 1.25
1 Common Creasing Stake 1.75
1 Bottom Stake ..... .25
1 Hatchet Stake 1.50
1 Candlemould Stake 1.25
1 Blowhorn Stake 2.00
1 Coppersmiths' Stake 2.00

NEW MACHINES.

1 Slitting Machine, gauge to 4 inches $10.00
1 No. 3 Niagara Beader, complete 20.00
1 Niagara 4 Head Stake, 2 heads only 3.85
1 Burton's Double Seamer 18.50
1 No. 3 Moore's Double Seamer 12.25
1 Smith's Patent Oval Handle Former 4 50
1 No. 0100 S. P. Former, 2 inch, 37-inch rolls 16.00
1 No. 2 Stow's Patent Gutter Beader. 3.00
1 Woodhead's Seam Closer 15.00
1 28 inch Burritt's Cross Lock Seamer 36.50
1 Bell's Edger, common gauge 22.00
1 28-inch Spangler's D. L. Edger, 2 rods 15.00
2 sets Spangler's Roofing Seamers, common gauge ..... 15.00 each.
1 set Spangler's Roofing Seamers, wide gauge 15.00
2 sets Spangler's Roofing Seamers, adjustable ..... 15 00 each.
9 Lyle's Cleat Formers ..... 1.00 each.
1 Quadruple (4 sides at once) Roofing Folder 70 00
1 Little Wonder Punch 15.00
3 Punches, each 3-16, ¼, for Little Wonder Punch ..... .35 each.
1 Coachmaker's Vise, 4 inch jaw 6.25
3 Manneer's Drills ..... 3.00 each.
1 No. 66 Buffalo Drill 7.00
2 No. 2 Stonemason's Hammers ..... .60 each.
6 6-inch Compasses ..... .20 each.
1 set 3-16 Steel Letters 5.00
20 Buttle's Fire Pots ..... 1.75 each.

BRUCE & COOK,
190 Water Street, New York.

WANTED.

One second-hand Power, Arch or Pillar Press. Weight from 4000 to 6000 pounds. For stamping or lettering two cross tin. Size of opening in bed about 16 in. x 22 in. Must be in good condition. Send illustration with lowest price.

SENSEMAN & BRICKENSTEIN,
Salem, N. C.

Special Notices.

FOR SALE.

A prosperous general Plumbing and Heating business. Established 40 years, in an Eastern city of 15,000 inhabitants. Volume of business $60,000 per annum. Stock and capital required small. Address

"PROSPEROUS," No. 32,

office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

The leading stove store in a growing manufacturing city of 20,000, near New York. This is an old, and the best business stand in the city. Large store and moderate rent. We do Steam and Hot Water and Hot Air Heating, Plumbing and Tinning. This is a good investment, but present owner has too much other business to see to. Can inventory down to $3000. Address "A. A.," No. 119. office of *The Metal Worker*, 96-102 Reade St., N. Y.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

FOR SALE.

Patent Steel Roofing, with the necessary tools for applying. electros for advertising, &c. Trade established. Good opportunity now open. Reasons can be given on application. Address

"COLUMBIA,"
office of *The Metal Worker*, 96 102 Reade Street, New York.

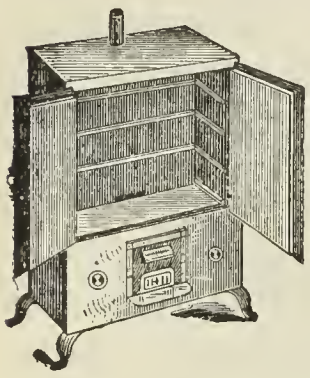
PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



Hotels, Steamships Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.

Burlington, Vt.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Prop.,
83 Fulton St. N. Y.

Capital.

It is a consolation for all right minded young men in this country that though they might not be able to command as much pecuniary capital as they wish, to commence business themselves, yet there is a moral capital which they can have which will weigh as much as money with those people whose opinion is worth having. And it does not take a great while to accumulate a respectable amount of this capital. It consists in truth, honesty and integrity, to which may be added decision, courage, perseverance. With these qualities there are few obstacles which cannot be overcome. Friends spring up and surround such a young man as if by magic. Confidence flows out to him, and business accumulates on his hands faster than he can ask it. And in a few short years such a young man is far in advance of many who started with him having equal talents and larger pecuniary means; ere long our young friend stands foremost, the honored, trusted and loved. Would that we could induce every youthful reader to commence life on the principle that moral capital is the thing after all.—*West Jersey Press.*

— BREAKING IT GENTLY: "Really, Mr. Stalate," she protested, "you have given me four hours of your time this evening."

"Why—er—upon my word! So I have. The hours pass like minutes when I am with you."

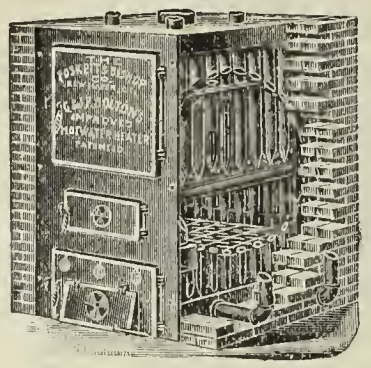
"You were telling me that since your promotion your time is valuable."

"Yes,"

"Well, papa doesn't allow me to accept expensive presents from young men."—*Washington Star.*

G. & J. R. BOLTON HEATERS.

HOT WATER.



STEAM.

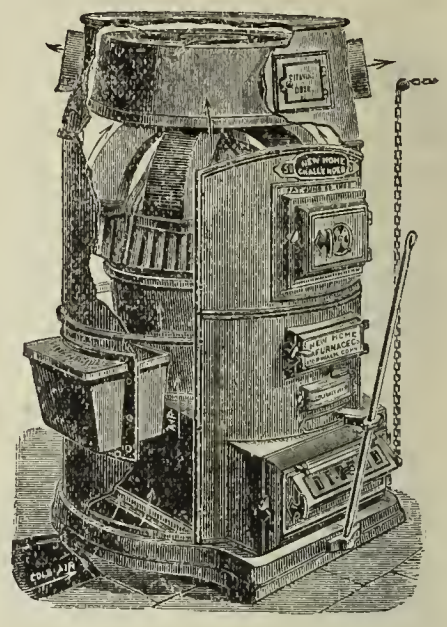
The Foskett & Bishop Co.,

MANUFACTURERS.

The Best Heating Apparatus in the World.

SEND FOR PRICES, ETC.

New Home HOT AIR FURNACES.



NEW HOME FURNACE CO.,
NORWALK, CONN.

SALESROOM:

George H. Raymond, Manager, 114 Liberty St., New York.

THE WILLIAMS PRINTING CO.,

Commercial Printers AND Binders.

ESTIMATES FURNISHED FOR ALL CLASSES OF WORK.

96, 98, 100 and 102 READE STREET, - NEW YORK.

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address

"STOVE FOUNDRY,"

Office of *The Metal Worker*, 96–102 Reade Street, New York.

Salesmen's Report Blanks. More Direct, More Reliable because More Frequent and Less Expensive than Agency Reports. Sample Sheet Free.

SALESMEN'S REPORT BOOK CO.,
Pottstown, Pa.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. Twenty Years' Experience. Send model or sketch and brief description of your invention for Free report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.

PATENT PRACTICE EXCLUSIVELY.

References Furnished on Application.

E. B. STOCKING, Attorney at Law,
611 F ST., N. W., WASHINGTON, D. C.

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,

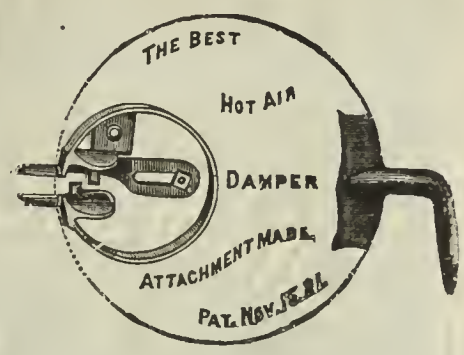
Solicitors of Patents.

OFFICES:

PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row.
WASHINGTON,
Atlantic Building, 928 F. St.

Crown Damper and Crown Damper Attachment.





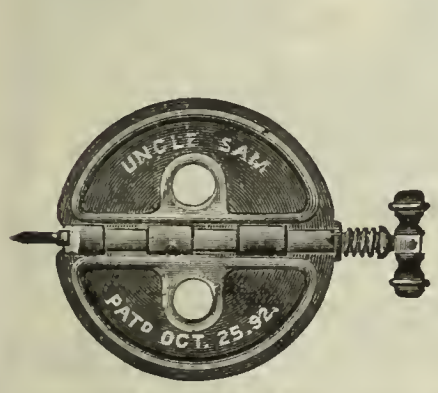
NICKEL PLATED HANDLE. PUT UP 1 DOZ. IN A BOX.

—MADE BY—

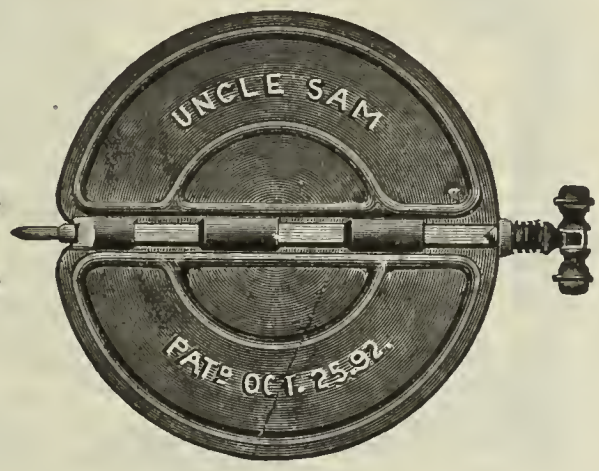
W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

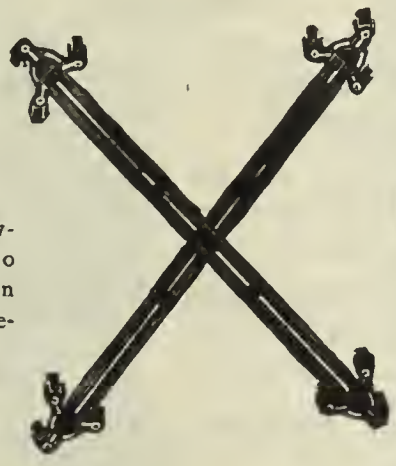
Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers

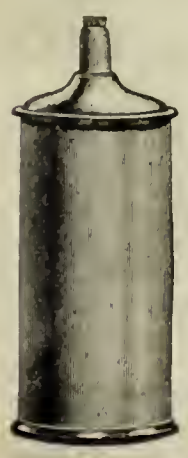


THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich





This little Torch is 4 in. high and 1¼ in diam and is designed to do away with the greasy candle. Will burn gasoline or kerosene oil.

Sold by All Jobbers.

Kendrick Valve & Washer Co.,

SYRACUSE, - N. Y.



The largest and best assorted stock in America All requisites for the draughting room. We have made a study of this line and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable.

CATALOGUE ON APPLICATION.



SOMETHING NEW.

The Little Giant Steel Truck. Strong, Light.

ENTIRELY OF

METAL AND AT A VERY

LOW PRICE.

Write for Circulars and Prices to the Manufacturers,

THE G. L. VAN NAMEE MFG. CO.,

Gouverneur, N Y., U. S. A.

THE TRIUMPH COOKER,

WITH LOCK COVER.



STEAMLESS, ODORLESS AND NON BOIL-OVER.

THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.

A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.

THE HARTFORD HOLLOW WARE COMPANY,

HARTFORD, CONN.

Your Correct Weight

The person who may have been congratulating himself upon a gain of several pounds in weight over a given period may not be pleased to learn, says an exchange, that Dr. Henri de Parrville finds this idea to be probably an illusion. This French investigator has satisfied himself by a five years' record of precise daily weighings of his own body that very few persons have any accurate knowledge of their own weight. In ordinary weighings no account is taken of the errors of the scales, of the weight of the clothing, of the time after eating, of the condition of the body as regards heating, or of the barometric or hygrometric state of the atmosphere. Discarding sources of error, the actual weight is constantly changing, being subject to innumerable influences. After breakfast, on a warm day, one loses more than a third of a pound an hour, and, as 70 per cent. of the body is water, our weight must constantly vary with the transpiration of moisture. It varies, moreover, with the pressure of the atmosphere. The mere variations in atmospheric humidity may account for a change of more than a pound, and other causes may account for another pound. For these reasons, the usual inference of a gain or loss of a few pounds in a considerable interval is to be distrusted. Accurate scales, however, are not without value in medical practice, lack of a certain definite growth indicating impaired health in young infants, while in adults a sudden increase of a pound or so in a day denotes a tendency to disease, and fluctuations of not more than three or four ounces per day are evidence of health.

— THE NEW WOMAN'S ARRIVAL —Miss Fan De Syckle: "Who was it said, 'The hand that rocks the cradle is the hand that rules the world?'"

Mrs. Strongmind: "I don't know. But, anyway, no one pays any attention to anything said of the men nowadays."—*Puck.*

— MARRIED MAN: "Why don't you get married, Miss Perkins? You are getting to look like a 'back number'—you will soon be an old maid."

Miss Perkins: "If I were as easy to please as your wife was, I would have been married long ago."—*Boston Home Journal.*

Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10 inches, Cloth. Price, $3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

CONTENTS:

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Sauce pans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set fo Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS,

Publisher,

96-102 Reade St., NEW YORK.



THE WONDERFUL LIGHTNING

Egg Beater.

Perfect beating in 1 minute.

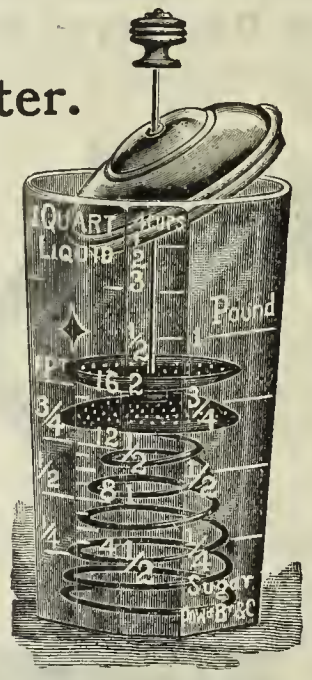
A combined dry and liquid measurer.

The cheapest and neatest of 'em all.

Once tried always used.

2 sizes.

Write for Prices.



LIGHTNING DASHER EGG BEATER CO.,

TOLEDO, O.

NEW YORK ELBOW CO.

18 Cliff St., N. Y. City.



Makers of Elbows AND Roasters.



ROYAL

WASH BOILER HANDLE.



PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,

116 N. 2d St., PHILADELPHIA, PA.

The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O.

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

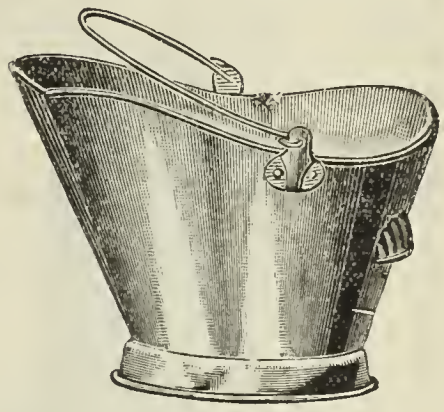
—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



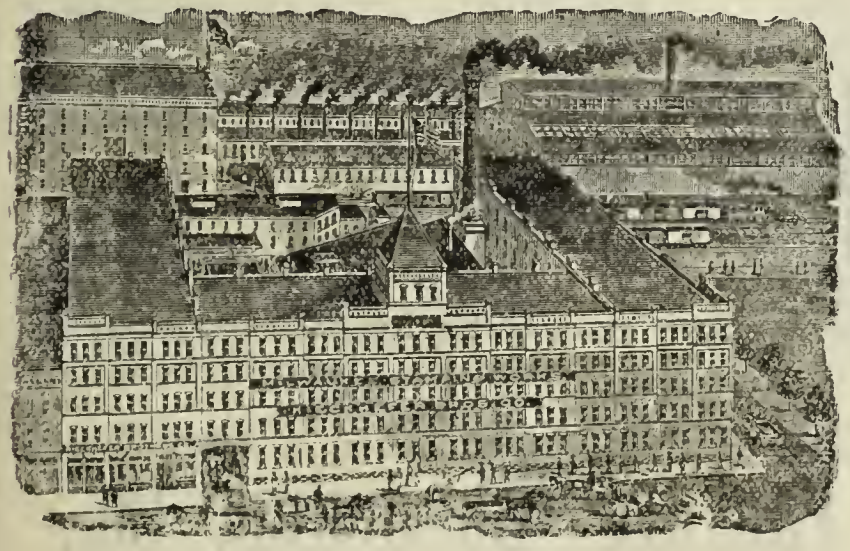
Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.



Agents for SPLENDID OIL COOKING STOVES
and MAJESTIC OIL HEATING STOVES,
And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED,
JAPANNED AND ENAMELED
PIECED AND STAMPED
Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.

American
WAFFLE IRONS.



The Best for Gas or Gasoline Stoves Easy to Clean. Long Wood Handles.

Buy no Other.

"ERIE" HOLLOW WARE LEADS, ALL OTHERS FOLLOW.

ALSO COMPLETE ASSORTMENT OF

FULL NICKEL PLATED WARE,

UNSURPASSED IN FINISH.

"ERIE" ALUMINUM CAST WARE,

THE FINEST WARE EVER MADE. IT WILL PAY YOU TO HANDLE IT.

NEW GOODS FOR SPRING TRADE.

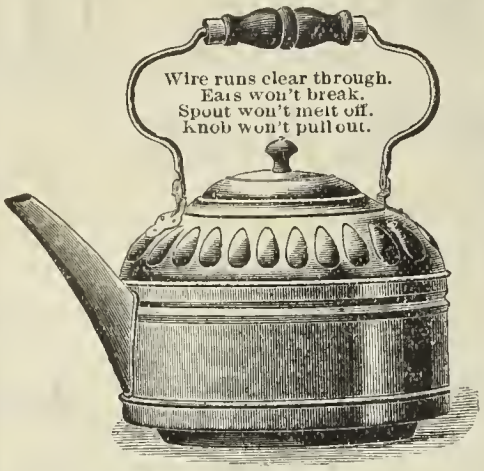
SEND FOR NEW CATALOGUE.

Try our Improved Double Broiler for Gas or Gasoline Stoves.

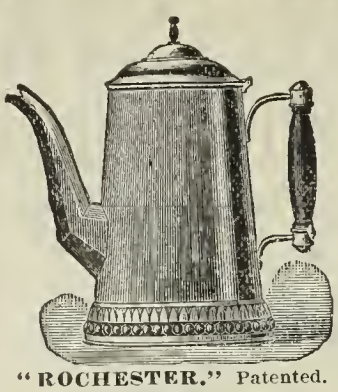
GRISWOLD MFG. CO., Erie, Pa.



"ERIE" ALUMINUM.



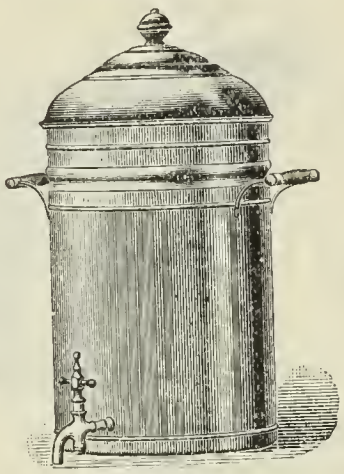
LATEST "ROCHESTER."
Patent pending.
White Satin Finish Inside.



"ROCHESTER." Patented.



ROCHESTER STAMPING WORKS,
Rochester, N. Y.,
STILL MAKE
NO TIN COVERS ON ANY OF OUR PLATED WARE.
Better Goods Than Ever.



"ROCHESTER" COFFEE URN.
Extra Heavy Copper, Nickel Plated.
Cold Handles, Riveted on.



"ROCHESTER." Patented.



"ROCHESTER" OLD STYLE.
EXTRA HEAVY.
White Satin Finish Inside.

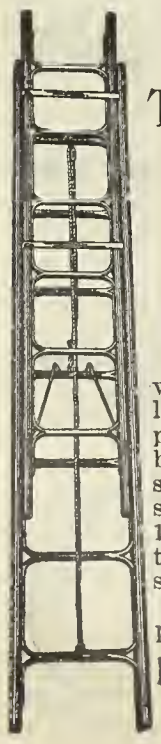
Acme Dinner Pail.

Improved. Best in the world.



Has a full brass ear and cover fastener combined.

Fully protected by patents.
Sold by first-class dealers everywhere. Write for prices.
MANUFACTURED BY
TRETHAWAY BROS., Parsons, Pa.



Look at this Ladder.

THE PATENT BENT RUNG LADDER.

The Strongest, Lightest and Best Ladder Made.

A sixteen-foot ladder only weighs 21 pounds. Extension ladders of this kind are easily put up and taken down by a boy. Our double and single step ladders have no equal. A six-foot step ladder will carry 1000 pounds, and will last three times as long as the old style step ladder.

Write for catalogue and price-list.

Indiana Ladder Co.,
INDIANA, PENNSYLVANIA.

ANTI-RUSTING WARRANTED. C. S. Mf'g Co.

WE WISH IT distinctly understood by all the hardware dealers, and also dealers in Tinware, throughout the United States that the

CLIFTON SPRINGS MANUFACTURING COMPANY,
CLIFTON SPRINGS, N. Y.,

is still in existence, shipping large quantities of the

Evans Patent Anti-Rusting Tinware

(trade-mark, a Greek Cross), notwithstanding the base falsehoods heralded about the country by the salesmen of our competitors.

The Packard Enameling Co.,



400 NORTH AVE.,
Warren, O.
—MANUFACTURERS OF—



Plain, Stained and Enameled Handles, Knobs and Pail Woods.

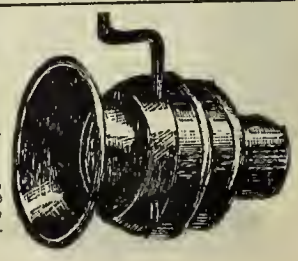
WRITE US FOR CATALOGUE AND PRICES. OUR WORK EXCELS.



W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.
Manufacturers of
Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

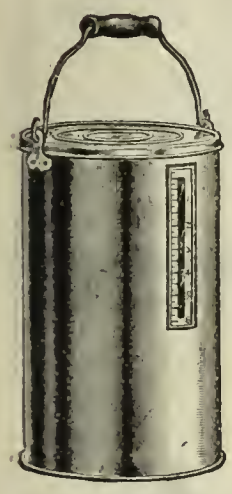
Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.



CREAM CANS

. . . AND . . .

Cream Can Trimmings.



Cream Cans

With Plain Covers.
With Deep Covers.
With Extra Deep Covers.
Self Locking.

Fairmont Cream Can Gages.



Cream Can Trimmings.

Cream Can Bottoms—IX, IXX, IXXX.

Cream Can Covers—Plain, Deep, Extra Deep.

Self Locking Trimmings—Ears and Lugs; Ears, Lugs and Bails

The Geuder & Paeschke Mfg. Co.

Manufacturers,

MILWAUKEE, WISCONSIN.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

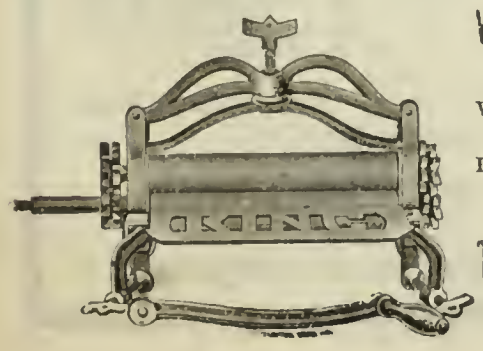
A Fruit, Vegetable and Jelly Press; Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces. Length, 10 inches. Can be sold in all seasons.

Write to Manufacturers for Prices.



WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

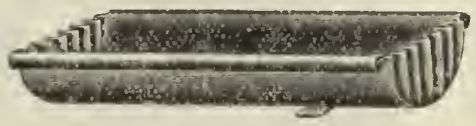
Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr
Boston Office, H. F. Livermore & Co., 34 Oliver St.

"We are Advertised by our Loving Friends."



Pat. Jan. 19th, 1895.

Look Here,

Hardware and Housefurnishing Dealers. An article you **must** keep is the wonderfully popular

Crusty Bread Pan.

The most perfect bread baker ever made. Every lady trying it acknowledges that. **Tests make customers** for this pan, and **that is a fact.** The Clark-Sawyer Co., a big Department Store of Worcester, Mass., say: "They are a good thing, and will make their own way, if people can be made to give them a trial." Your jobber must be in the list below. Write them for prices. They all carry this popular pan in stock.

MADE ONLY BY

The Niles Mfg. Co.,

NILES, OHIO.

HIBBARD, SPENCER, BARTLETT & CO.,
HORTON, GILMORE, McWILLIAMS & CO., Chicago, Ill.
WM. FRANKFURTH HARDWARE CO.,
JOHN PRITZLAFF HARDWARE CO., Milwaukee, Wis.
FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.
R. D. CONE CO., Winona, Minn.
A. F. SHAPLEIGH HARDWARE CO., St. Louis, Mo.
RICHARDS & CONOVER HARDWARE CO., Kansas City, Mo.
WYETH HARDWARE & MANUFACTURING CO., St. Joseph, Mo.
THE GEORGE TRITCH HARDWARE CO., Denver, Colo.
EMPKIE-SHUGART CO., Council Bluffs, Iowa.
SICKELS, PRESTON & NUTTING CO., Davenport, Iowa.
A. BALDWIN & CO., Limited, New Orleans, La.
FITTEN-THOMPSON HARDWARE CO., Atlanta, Ga.
PHILLIPS & BUTTORFF MANUFACTURING CO., Nashville, Tenn.
STRATTON & TERSTEGGE, Louisville, Ky.
THE F. H. LAWSON CO., Cincinnati, Ohio.
VAN CAMP HARDWARE & IRON CO., Indianapolis, Ind.
STANDART BROTHERS, Detroit, Mich
THE GEO. WORTHINGTON CO.,
THE McINTOSH-HUNTINGTON CO., Cleveland, Ohio.
L. H. SMITH WOODEN WARE CO., Limited, Pittsburgh, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
CHARLES MILLAR & SON, Utica, N. Y.
BARKER, ROSE & GRAY, Elmira, N. Y
SHIELDS & BROTHER, Philadelphia, Pa.
C. S. MERSICK & CO., New Haven, Conn.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, Etc.

"A FULL LINE AND SUPERIOR GOODS."

Write us for Catalogue and Prices.

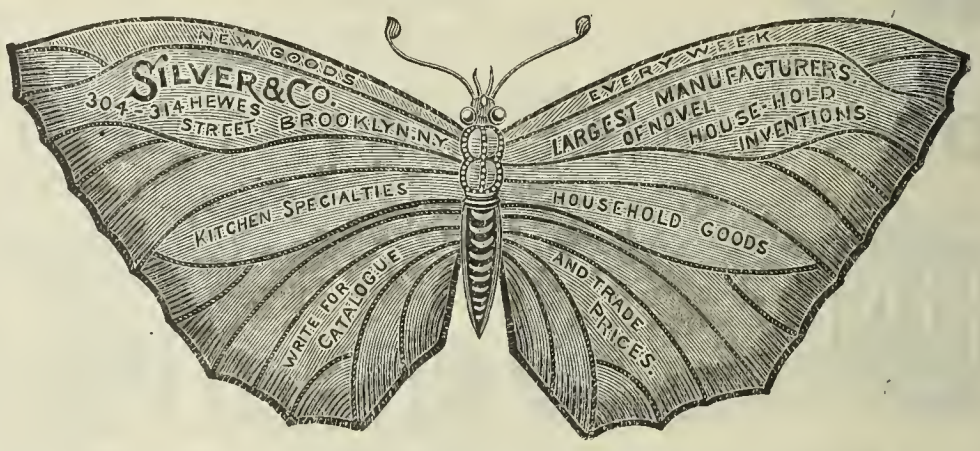


ROME MFG. CO., - Rome, N. Y.

New York Store, 92 Walker St.

Everything Carried in Stock at our New York Store.





EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES,

"MARION HARLAND" Tea and Coffee Pots and Urns.

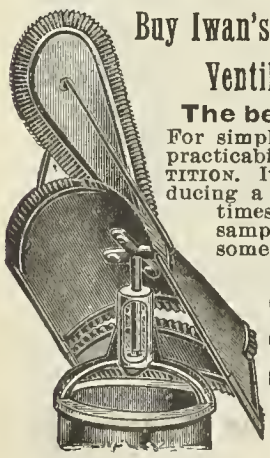
Royal and Crown Roasters and Bakers

Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses,

Steam Cookers, Milk Sterilizers, Bread and Cake Pans,

Display Stands and Household Novelties.



Buy Iwan's Volcano Revolving Ventilating Chimney Top

The best in the World

For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.

FOR SALE BY

Berger Bros., Phila., Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Cincinnati Stamping Co., Cincinnati, O.
Illinois Roofing & Supply Co., Chicago, Ills.

IWAN BROS.

Sole Mfrs., Streator, Ills.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

When In Need of

FINE STOVE PLATE FACINGS,

Write to the **originators** and **headquarters** for prices and trial samples.

THE S. OBERMAYER CO., - - - - Cincinnati, O., and Chicago, Ill.

MANUFACTURERS OF

Foundry Facings, Supplies and Equipments. Importers and Refiners all grades Plumbago.

Catalogue and special circulars sent on application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE CONNECTICUT PLATING CO.,

No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work.
Estimates cheerfully submitted.

PAYNE'S BUSINESS EDUCATOR,

600 pages, bound in cloth, $2.

Every business man should have some knowledge of the State and general laws of the country, especially those affecting the collection of accounts, rates of interest, &c. He should be able to draw up many of the simpler papers, such as leases, contracts, &c. He should be familiar with the different forms of legal papers used in business, and, above all, he should be an easy and pleasant letter-writer. All these points are carefully treated in Payne's Business Educator.

Among the subjects specially discussed are:

Commercial Correspondence.—Over 150 models of letters are given, covering every phase of business correspondence.

Legal Forms Used in Business.—Articles of copartnership; notice of dissolution, form of assignment; short form of deed; bill of sale; power of attorney; lease; surety; will; notes—promissory, negotiable, non-negotiable and demand; exchange—inland and foreign; acceptance; due bill; receipt; bills of lading; private cost marks, &c.

Dictionary of Mercantile Terms.—Giving a full and clear explanation of terms used in business.

Titles.—Official, military, scholastic, naval and professional titles used in the United States.

Useful Hints for Measuring Land.

Legal Rates of Interest, foreign coin, weights and measures compared with American standards.

Rules for Punctuation.

Rules of Order for deliberative assemblies and debating societies.

Interest Tables, and tables of weight and measures, &c.

How to Use a Typewriter, with lessons for practice.

Exercise in Practical Penmanship.

Laws and Forms.—An epitome of the laws of the United States and of the different States of the Union, which will be found invaluable to those who are forced to appeal to the law, as well as to that large class who wish to avoid it. The whole is alphabetically arranged, so as to make reference easy. Forms are given for a great number of legal papers, &c.

Dictionary of synonyms; marks of account; list of abbreviations; French, Spanish, Latin and Italian words and phrases, &c

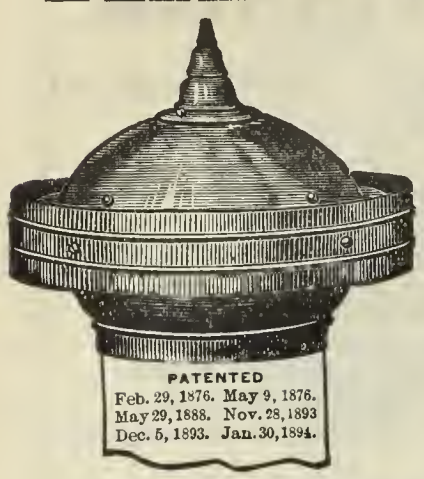
Making in all the most complete self-educator published.

Sent postpaid on receipt of price by

DAVID WILLIAMS, Publisher and Bookseller,

96-102 Reade Street, New York.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,
TROY, N. Y.

SELF LUBRICATING

Rotary Screw Ventilators



WHICH PRODUCE
a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Green houses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,
Manufacturers,
46 Cortlandt St., New York
☞ *Send for illustrated circular.*

WOOD AND IRON
PATTERNS
FOR STOVES AND FURNACES.
Water and Steam Boiler Work a Specialty.
H. CLAY BASCOM, Prop.,
VEDDER PATTERN WORKS,
TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS
JOHN K. McLAUGHLIN,
215 North 2d St., - - - Philadelphia.
FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction
Cor. Randolph and Atwater Sts.,
Detroit, Mich.

Established 1866.

EDWARD L. CALELY,
STOVE PATTERNS
TO ORDER.
945 Ridge Ave., PHILADELPHIA, PA

CENTRAL PATTERN WORKS,

Stove and Furnace Patterns a specialty. Work first-class under a full guarantee.

E. C. HALTEMAN,
Proprietor, Dayton, O

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers' original patterns.
MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.
A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH
WHEN HE SAYS THAT THE
RUTLAND LINING
FITS ANY STOVE.
RUTLAND FIRE CLAY CO., Rutland, Vt.



"FIRESTONE"

Has proved itself to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,
TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

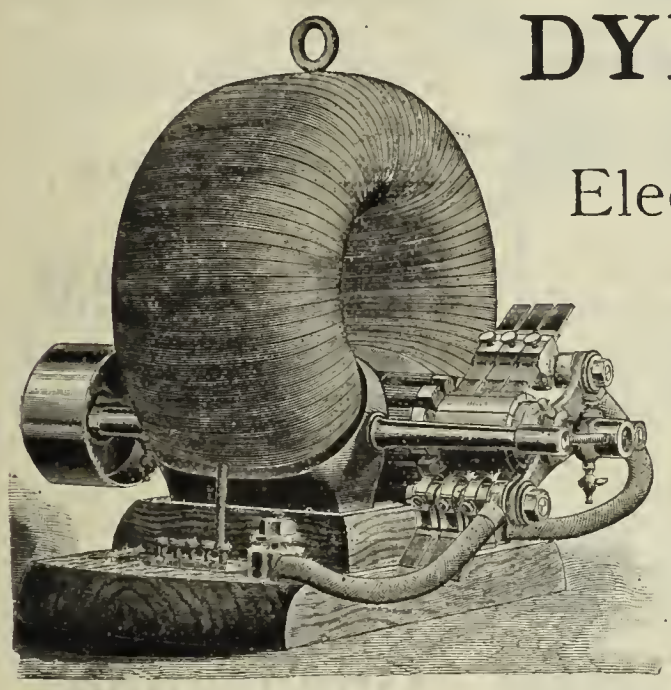
Every workman a brainy specialist.

NICKEL PLATING

ZUCKER & LEVETT & LOEB CO.
8 TO 14 GRAND STREET,
NEW YORK, U. S. A.

SEND FOR CATALOGUE OF
NICKEL & ELECTRO-PLATING
SUPPLIES & POLISHING MATERIALS.

OUTFITS.



DYNAMOS

—FOR—

Electro-Plating,

NET PRICES:

No. 0, 200 Gallons, Nickel, $100
No. 1, 600 " " 200
No. 2, 2000 " " 400

—THE—

Eddy Electric Mfg. Co.,
Windsor, Conn.

ESTABLISHED 1820. INCORPORATED 1891

The Hanson & Van Winkle Co.,

MANUFACTURERS OF

NICKEL AND ELECTRO PLATERS' MATERIAL



Nickel-Plating Outfits
From $20 upward.
DYNAMO-ELECTRO MACHINES
For all purposes.
The New H. & V. W. Dynamo Machine.
In sizes from No. 1 to No. 5.
FROM $100 TO $800.

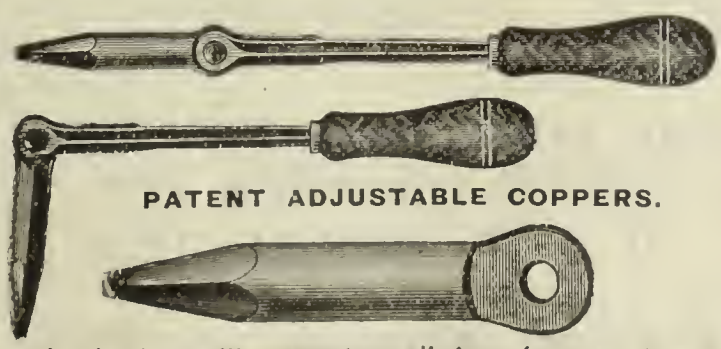
These machines will be placed on 30 days' trial with responsible parties, and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.

219-221 Market St., Newark, N. J.
81 Liberty St., New York.
35-37 South Canal St., Chicago, Ill.

WE FURNISH EVERYTHING.

Covert Pat. Adjustable Soldering Irons and Coppers

It is a complete tool in every respect, and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.



PATENT ADJUSTABLE COPPERS.

☞A sample of ⅞ in. soldering iron will be sent by mail, free of postage to any address, on receipt of sixty cents (60c.).

FOR SALE BY ALL GENERAL HARDWARE AND PLUMBERS' SUPPLY HOUSES.

COVERT MFG. CO., - West Troy N. Y.

SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

48 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

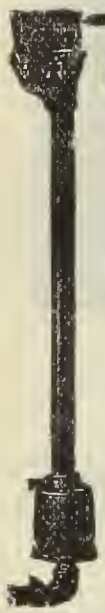
Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

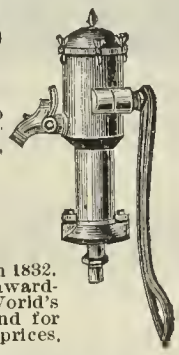
85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON,

166 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



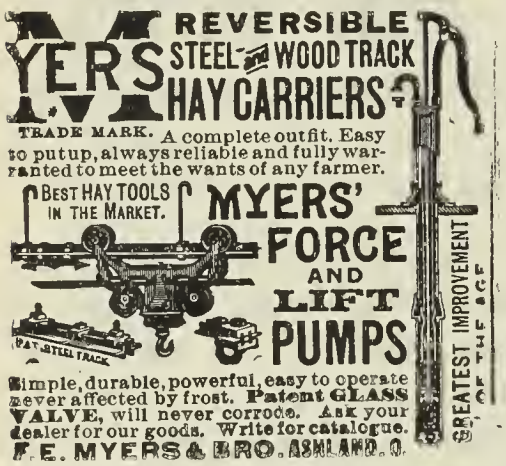
Hydraulic Rams,

Garden Engines, Pump Chain and Fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.



MYERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.

Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.



OUR ADJUSTABLE STOCKS and DIES are universally acknowledged to be the **BEST!** We also make all our Tools on the same principle, of the **Best Material** and **Workmanship**, and always with a view of *time and labor saving in their use.*

Gas-Lighting and Gas-Fitting,

——INCLUDING——

Specifications and Rules for Gas Piping, Notes on the Advantages of Gas for Cooking and Heating, and Useful Hints to Gas Consumers.

By WM. PAUL GERHARD.

A pocket-book for gas companies, gas engineers and gas fitters, for manufacturers of gas fixtures and dealers in gas appliances, for gas consumers, architects and builders, health officers and sanitary inspectors.

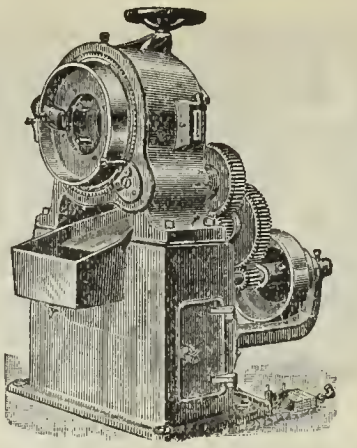
Second Edition, Rewritten and Enlarged
16mo, boards, 50c.

Sent, post-paid, on receipt of price by

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade St., New York.



No. 3½ Power Pipe Threading Machine Range 2½ to 6 in., Right Hand.

When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.



GUM A RUBBER,

Or

RUBBER GUM,

Or

Elastic Cement.

No matter what you call it,

IT'S A DANDY.

Just what you want to make a pipe joint tight. It discounts

WAX, RED LEAD, BLACK LEAD.

Holds the mercury sky high on a test job.

BAILEY-FARRELL MFG. CO.,

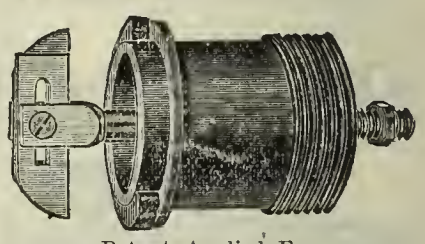
PITTSBURGH.

"Salvage Closet Connection."

For Repairing Earthenware Closets of all kinds when the Flush or Revent Horn is broken off. It will **SAVE THE CLOSET AND MAKE IT BETTER THAN NEW.**

It is SIMPLE and PRACTICAL, Easily Adjusted and RELIABLE.

It can be attached without removing the bowl. It has the "standard thread" and can be put in place, if only a part of the "Horn" is broken off, without the necessity of having the balance of it smooth.



Patent Applied For.

A trial will convince you of the superiority of this over any other connection made for this purpose. Write for circulars and prices.

MANUFACTURED BY

SPROUL & McGURRIN, 186 E. Fulton St., = = Grand Rapids, Mich.

DEALERS IN PLUMBERS' SUPPLIES.

The "Boyd" Basin.



Made in Ivory Body and all styles of Decoration.

THE ACME OF SANITATION.
HAVE YOU SEEN IT?
IF NOT, GET POSTED.

We Will Post You.

PECK BROS. & CO.,

Fine Sanitary Goods,

47 Cliff St., NEW YORK — 127 Chestnut St., NEW HAVEN, CONN. — 259 Wabash Av., CHICAGO. — 65 Oliver St., BOSTON.

DRAWN STEEL SINKS

Anchor and Diamond Brand

MANUFACTURED BY

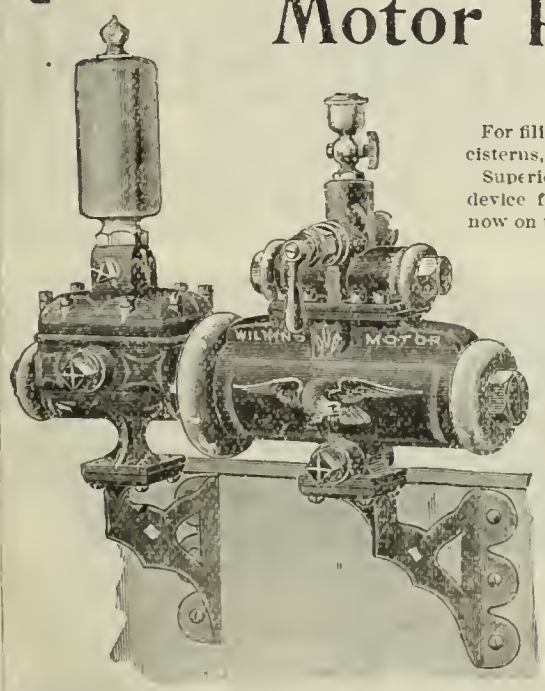
L. Wolff Manufacturing Company,

GENERAL OFFICES, 93 W. Lake Street, Chicago.

Write for Illustrated Price-List Just Published.

THE "WILKINS" IS KING.

Motor Pumps.



For filling tanks from cisterns, etc.

Superior to any other device for the purpose now on the market.

It is compact, simple, cheap and durable. Nothing to get out of order or leak. No drip pan is necessary to catch grease. Every pump guaranteed.

We manufacture a full line of High Grade Sanitary Specialties and invite correspondence.

THE
Columbus
Brass Co.,
COLUMBUS, - - OHIO.

MAPLE SYRUP CAN and SAP BUCKET STOCK.

We are now prepared to quote and ship promptly. Get our prices before buying.

J. M. & L. A. OSBORN, - - - CLEVELAND, O.

Gray Iron Castings,
Cheap Heating Stoves,
Diamond Thimbles.

S. CHENEY & SON,
MANLIUS, N. Y.

Helper Fire Pot

FOR PLUMBERS' AND TINNERS' USE.

A Combination of Fire Pot and Torch.



The only pot where the burner is on a swivel and patented.

The only fire pot with 16 gauge brass tank. All our goods guaranteed.

SEND FOR CATALOGUE.

UNION HEATER SUPPLY CO.,
88 Congress St, East, Detroit, Mich.

GLOBE SOLDERING FURNACE.



The Tinners' and Plumbers' Wonder.

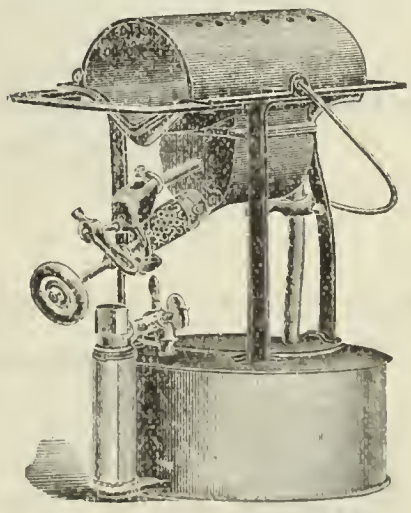
Saves half the fuel, melts quicker, and is easier operated than any other.

Works indoors and out equally well.

Write for Prices.

COUCH BROS. MFG. CO., DAYTON, O

NO. 1 BONANZA FURNACE,



For Tinners only. Price $6.

Hinged arch top. Galvanized steel with brass top tank. Best furnace for roofs or cornice work. Cannot blow out. Rubber pump handle. Burns from both sides. Heat terrific; heats 5-pound coppers red in 3 minutes; heats 10-pound coppers in 5 minutes; melts 10 pounds lead in 5 minutes. Hottest fire ever produced from gasoline.

Write for New Catalogue. Special Low Prices for Cash with the Order.

M. L. HULL, - CLEVELAND, OHIO.

THE KELLY

Self-Acting Frost-Proof, After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

—SEND FOR CATALOGUE.—

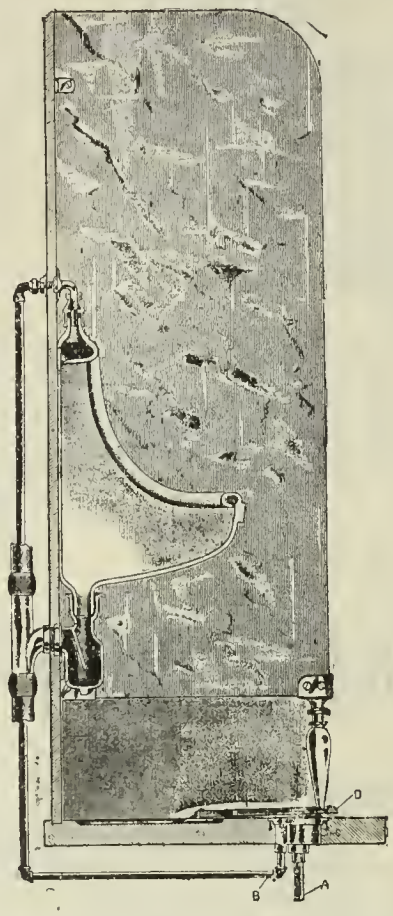
Thomas Kelly & Bro.,

124 Franklin St., Chicago,

Manufacturers of Permanent Plumbing Goods.

AUTOMATIC FLUSHING VALVE FOR URINALS.

OPERATED BY TREADLE.



This is the neatest and most economical method yet designed for the purpose. Urinals flushed by this method will be cleaner and freer from stoppage than those flushed by any other system, and less water consumed in doing it, for the simple reason that the flush only occurs when the urinal is in use.

The operating valve has a flange on its upper end for bolting to the floor, and which is let into the floor slab, thus presenting a smooth flush surface which can be easily washed. The top of the valve is arranged with a cap; by unscrewing this all the working parts, including the seat, can be taken out for repairs when necessary, thus leaving nothing but the main supply "A" the supply to Urinal "B," and the Valve Chamber "C," either in or under the floor, and these parts may be considered almost imperishable.

The treadle "D" is Cast Iron, galvanized (also furnished in brass), one end of which is fastened to the floor slab by brass bearings which permit of its being thrown back for the purpose of cleaning under it. The other end rests on the valve spindle.

When a person stands on the treadle (and he cannot get at the urinal unless he does), the flush begins and continues until he leaves it, when the valve closes automatically. By this method the flushing water is delivered at the time it is most required, and is, therefore, unlike the periodical flushing tank, which is delivering water regardless of whether the urinal is in use or not, and so wasting water.

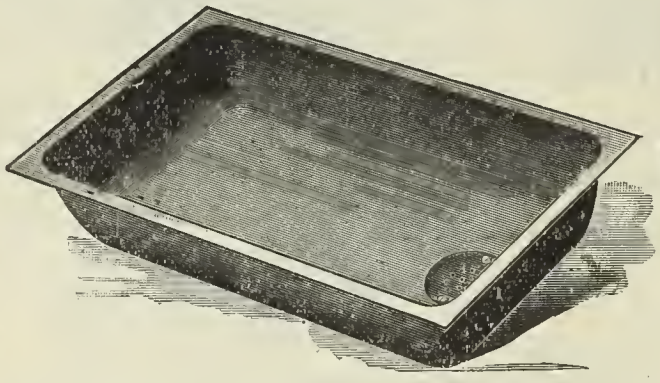
Dalton-Ingersoll Company,

169 to 175 High Street,

Fort Hill Square, - BOSTON.

Chicago Branch: 65 Washington St., Institute of Building Arts.

New York Agency: C. Hoffman, Jr., 277 Pearl St.

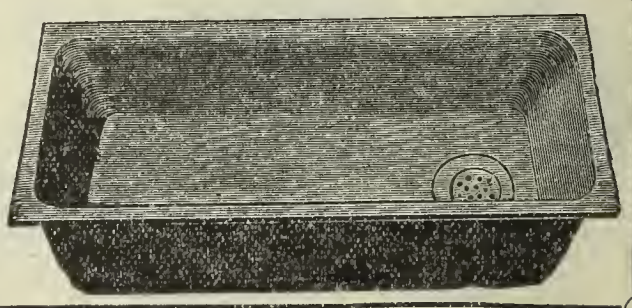


Made of

Wrought Steel

they cannot break

and are superior in many ways to the old cast sinks. They are not porous, hence non-absorbent, and are in consequence free from smell and filthiness, etc.; light, cheap and made in all sizes and finishes. Write for price.

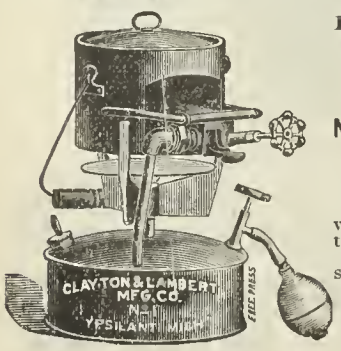


THE

Kilbourne and Jacobs Man'fg Co.

Columbus, Ohio, U. S. A.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

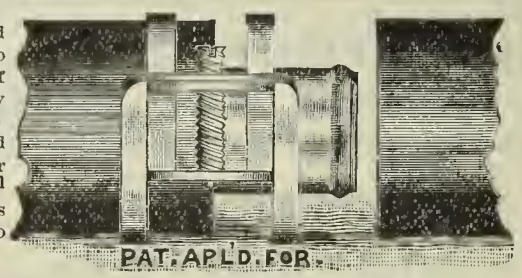
They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.

Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screw driver being all the tools needed to apply it.



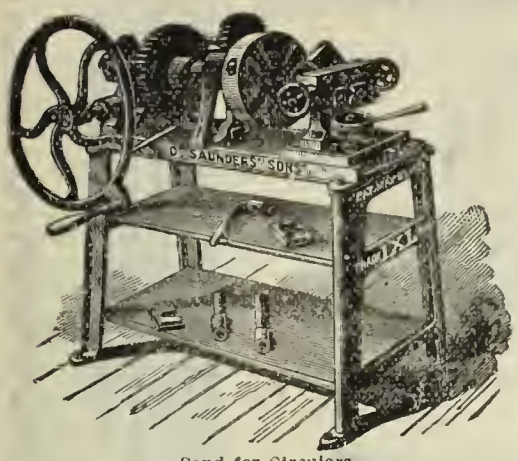
Mender tubes are seamless brass, give full water way, are easily inserted and will not rust. Sold by Jobbers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.

D. SAUNDERS' SONS,

MANUFACTURERS OF THE ORIGINAL



TRADE **I. X. L.** MARK

Pipe Cutting and Threading Machine.



Beware of imitations. None genuine without our Trade-Mark and Name.

STEAM AND GAS FITTERS, HAND TOOLS.

Also, Patent Wheel Pipe Cutters.

AS SHOWN BY THE CUT.

Pipe Cutting and Threading Machines for Pipe Mill Use a Specialty.

27 Atherton St., Yonkers, N. Y.

Send for Circulars.

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

INEXPENSIVE.

It is so lined that it will not crack, nor split neither can it rust.

No trouble at all to keep it clean, for it cannot harbor dirt nor vermin. It is an open sanitary fixture, no wood but the rim; unbreakable, light, artistic, low priced.

Don't buy an imitation—get the **Steel Clad.** All plumbers and jobbers have it, or the

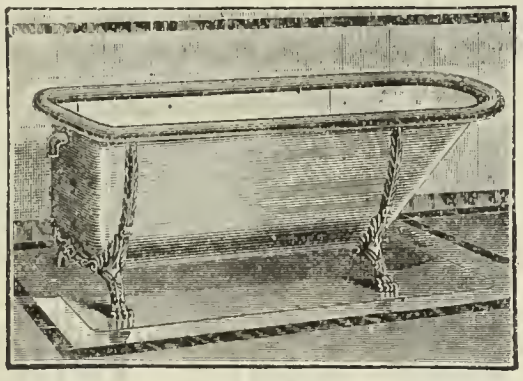
STEEL CLAD BATH CO. OF NEW YORK,

447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

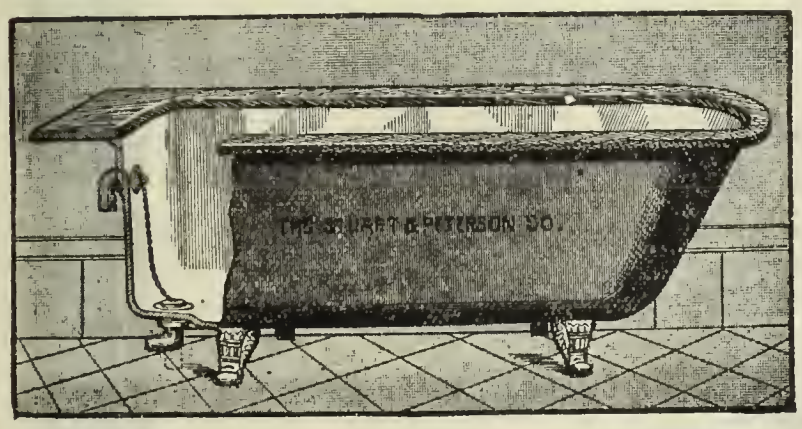
STEEL BATH MFG. CO.,

Detroit, Mich.
GEORGE BOOTH, President.

Better than the high priced ones, for a low price. Many styles and sizes, only one quality—the best.



WELL!! WELL!! WELL!!



PORCELAIN LINED BATHTUBS, WITH Overflow Strainers and Plugs Complete

$28.00

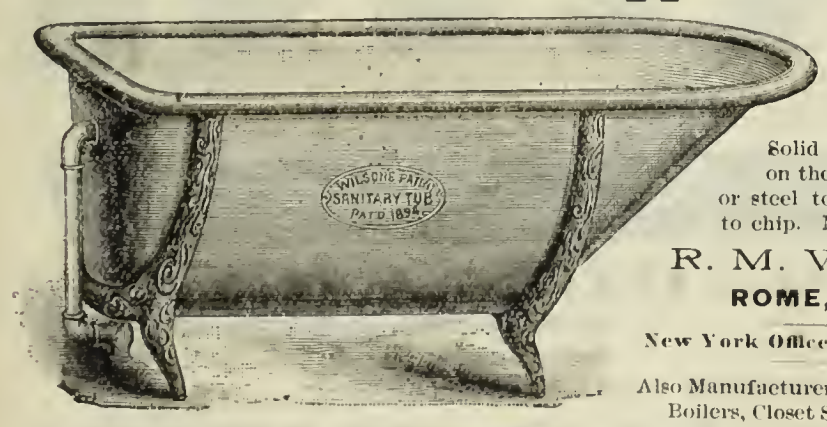
WRITE US.

The Stuart & Peterson Co.,

Burlington, N. J., U.S.A.

Porcelain Lining to order.
Special Goods to Order

R. M. Wilson's Solid Copper Bath Tub.



WRITE FOR CATALOGUE.

Success assured to all who handle the Wilson Patent Sanitary Bath Tub. The only Solid Copper Bath Tub on the market. No iron or steel to rust. No enamel to chip. Manufactured by

R. M. WILSON,

ROME, N. Y.

New York Office, 92 Walker St.

Also Manufacturer of Copper Range Boilers, Closet Seats and Tanks and Brass Work.

Leather and Rubber

WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 39th Street, NEW YORK.

LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order.

BROUGHTON SELF-CLOSING

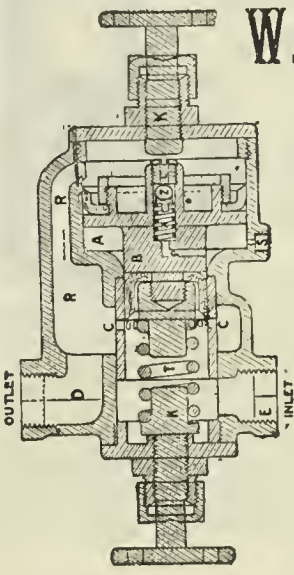
COCKS.

EVERY ONE WARRANTED.



Send for Circular.

E. STEBBINS MF'G CO. Sole Manufacturers
BRIGHTWOOD, MASS.



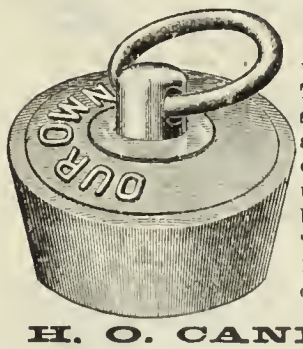
W. G. Taafel's Pressure Regulator.

Send for Price-List.

NEWARK REGULATOR COMPANY

Newark, Ohio.

BASIN AND BATH TUB PLUG.



White Rubber with Heavy Nickel Trimmings. Absolutely the neatest and strongest plug on the market. Put up one dozen in a box, and labeled "OUR OWN" BASIN PLUG only.

H. O. CANFIELD,

—MANUFACTURER OF—

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.

— REMINISCENT.—The author had written one successful story, and he never grew tired talking of it.

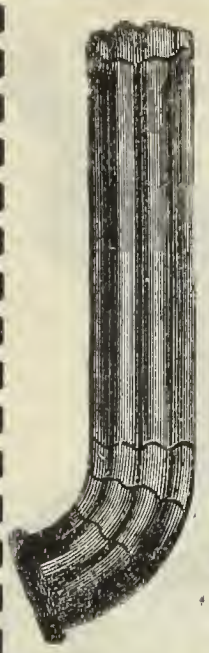
"Don't you know," said one of his friends to another one day, "Riter always reminds me of a plessed dog."

"That's odd. How does he?"

"He's always wagging his tale."

— BR'ER RABBIT WAS SAFE.—First Rabbit: "Come on quick. I see a man with a gun coming across the fields."

Second Rabbit: "Oh, don't be in a hurry. It is ten to one that he will pull the gun after him by the muzzle when he climbs that fence."—*Indianapolis Journal.*



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.





THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade. Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

8-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK. New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.

EAVES TROUGH HANGERS.

PROUDMAN BROS.,

MERIDEN, CONN.



TINNERS, ATTENTION! GREAT REDUCTION IN PRICE.

Best Eave Trough Fastener in the World.

Tapp Patent Champion Fastener

MANUFACTURED BY

WALTHER & CHRISTMAN,

Successors to CHAS. BODY,

269 to 275 Central Ave., Cleveland, Ohio

Send for sample and price-list





STYLE O.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

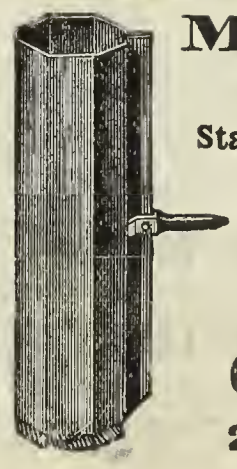
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,

(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

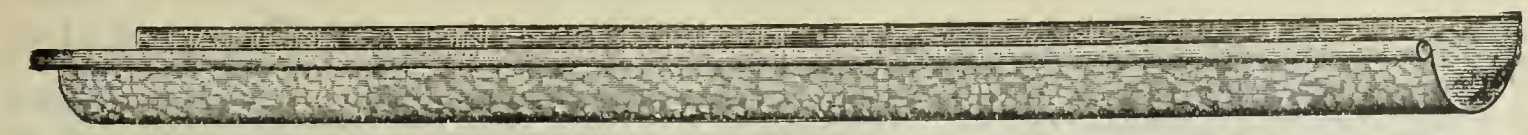
With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.



BOWERS ROOFING AND METAL WORKS.

Eaves-Troughs, Gutters, Miters. Trough-Ends, Conductors, Ridging. **BINGHAMTON, N. Y.**

EAVE TROUGH

THE KANNEBERG ROOFING CO.,
CANTON, OHIO, U. S. A.

MANUFACTURERS OF

Patent Eave Trough and Hangers, Conductor Pipe, O. G. and Box Gutters, Ridge Roll and Capping, Ventilators, Finials, Cresting.

Patent Steel Roofing,* Metallic Shingles, Crimped, Beaded and Corrugated Steel, Steel Weather-Boarding, Sheet Steel Pressed Brick, Mixed Roof Paint, Building Paper, etc.†

* Write for sample.

† Get Illustrated Catalog.

CONDUCTOR Pipe.

ZERO VALVE CO.,

212 Seneca St.,
BUFFALO,
N. Y.



Vollmer Anti-Freezer Valve.

Cheapest Valve in the Market.

SEND FOR CATALOGUE.



CLARK'S NEW FAUCET

—— FOR ——

MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.

This Cut is 2-3 the Size of Faucet.

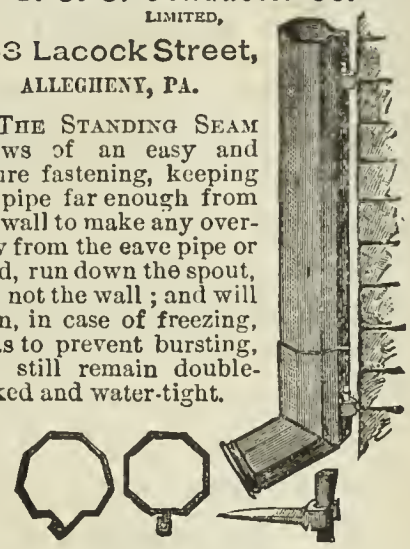
SLATE

FOR ROOFING AND BLACKBOARDS.

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS.

AULD & CONGER,
100 EUCLID AVE., CLEVELAND, OHIO.

THE IRWIN & REBER
PATENT
EXPANDING WATER CONDUCTOR.
MANUFACTURED BY THE
S. S. S. Conductor Co.
LIMITED,
163 Lacock Street,
ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.



The Climax Ratchet Stock

Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

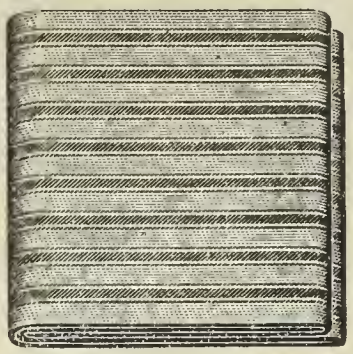
No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, $10.00

No. 2 threads 1 to 2 in. pipe, takes 2½, 3 and 4 in. die, $17.00

For sale by leading jobbers.

Manufactured Solely By

C. M. KEMP MFG. CO.,
Baltimore.



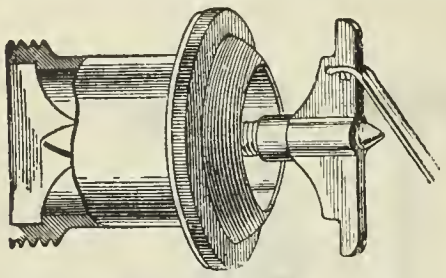
"Columbia" Wiping Cloths FREE!

Not free exactly from a financial standpoint (altho' very near it), but free from all defects due to a **Poor Quality of Ticking, Carelessness in Making and a Bungling Manner of Fastening the Ends.** A cloth free from the above defects is well worth the price we ask, 12 cents each, or six for 70 cents. Remember we make any kind—send us the size you want, giving the wiping edge first.

THE J. W. CHAMBERLAIN CO.,
Plumbing & Steam Fitting Specialties,
BANGOR, MAINE.

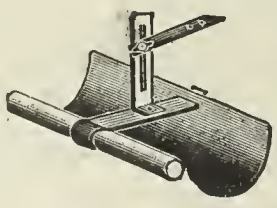
CLOSET REPAIR COUPLING.

(Patent applied for.)



MADE in two styles, to suit iron and lead pipe.
TAKES the place of the old spud and necessitates no change in fixtures.
MANUFACTURED ONLY BY
SAVILL, WALLS & CO.,
Mfrs. of Plumbers' Supplies,
229 Budden Street - - - - PHILADELPHIA.

RICHMOND



E. T. HANGER. PATENTED.

TINNER, ATTENTION!

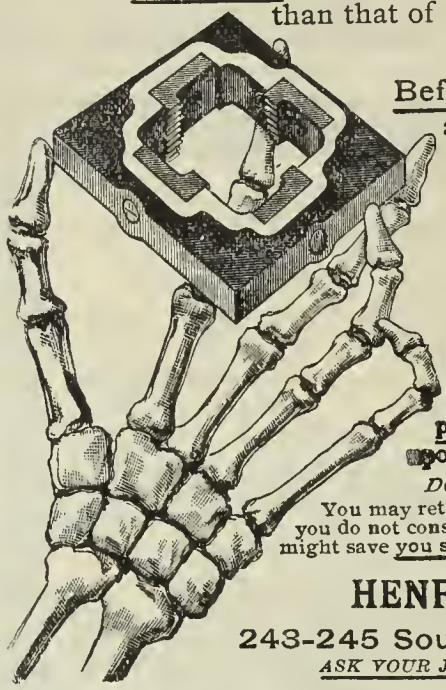
The cross-bar is hooked firmly to both sides of the trough. The slotted upright, with thumb-screw, permits instant adjustment to the requisite fall. It is never necessary to bend the suspending rod to suit pitch of roof. No obstructions to catch leaves and dirt, as in other adjustable hangers. **Save Time and Money.** Sample order freight allowed. For sale by first-class Jobbers. Manufactured by
JOHN SEVERDING, - - Richmond, Ind.

Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

1

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

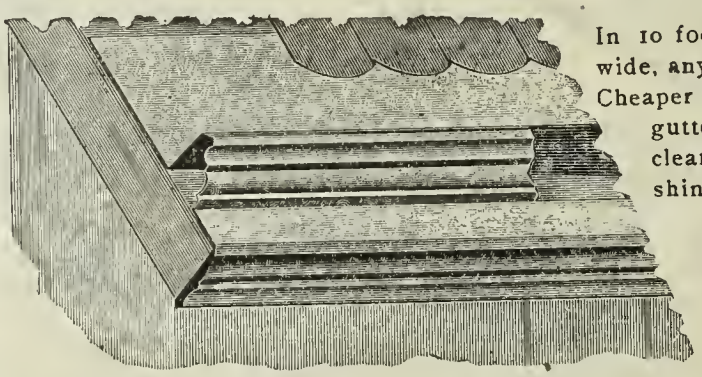
A sample One-inch "Skeleton" Pipe Die either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you 62 cents, and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

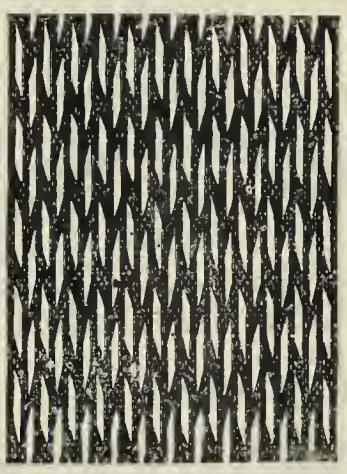
HENRY B. PANCOAST & CO.,
243-245 South 3d Street, Philadelphia, U. S. A.
ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.

Sims' Ornamental Roof Gutter.



In 10 foot lengths, 12 in. to 30 in. wide, any fall desired, will not leak. Cheaper than wood or any other gutter. One continuous piece, clear up under slate or tin or shingle. Write for prices.

The
Sims Mfg. Co.,
Newark, O.



SHEET METAL LATH.

Improved METALLIC LATHING is now being used in construction of all modern buildings, being FIRE-PROOF, RIGID, with ample keying qualities, and is easily applied, and embraces a material saving in plaster if necessary

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING. &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted and Corrugated Leader, cheapest and best in the market. Sheet iron piping, Stove Pipe and Fittings of every description.

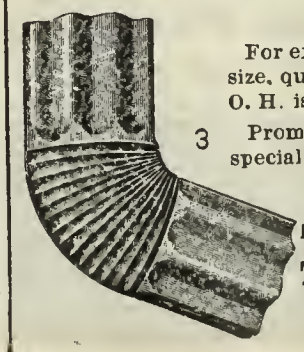
General Galvanizing to Order.

The Jersey City Galvanizing Co. Manufacturers and Jobbers in
Galvanized Material of Every Description.
Works, Jersey City. Store, 112 John St., New York.
SEND FOR CATALOGUE OF OUR SPECIALTIES.

The "O. H." One Piece PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

(PATENTED OCT. 25, 1892.)



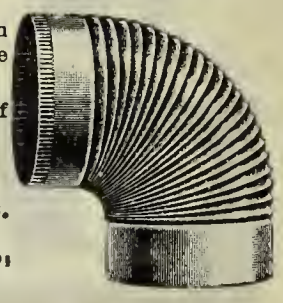
For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

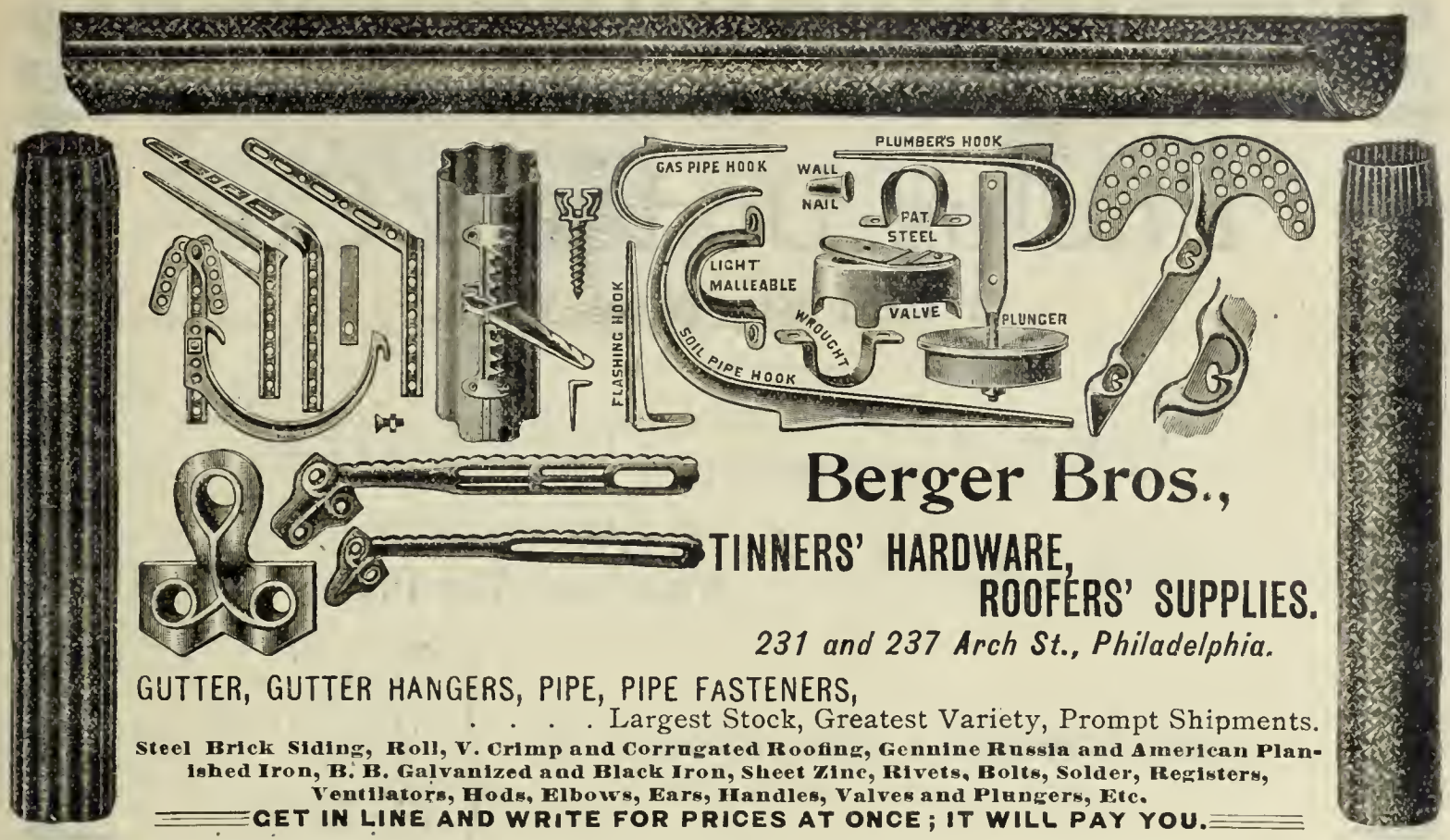
3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.

For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,
WAVERLY, N. Y.





Berger Bros.,

TINNERS' HARDWARE, ROOFERS' SUPPLIES.

231 and 237 Arch St., Philadelphia.

GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,

. . . . Largest Stock, Greatest Variety, Prompt Shipments.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Gennine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Hods, Elbows, Ears, Handles, Valves and Plungers, Etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING : SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, RAILS, TOOLS, FELT, CEMENT, ETC.

QUARRIES, BANGOR, PA.

NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE Kitchen Sinks, Laundry Tubs, Washstand Tops, Marbleized Shelves, Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also Mantels.

FAIRHAVEN, VERMONT.

SEND FOR CATALOGUE.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, • • EASTON, PA

When Painting Roofs,
When Painting Stacks or Boiler Fronts,

use Dixon's Silica-Graphite Paint and you will never regret it. Roofs well painted have not required repainting in 10 to 15 years. Graphite paint is equally useful for wood or metal. Send for circulars.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

THE ROOT & BARRON

ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer,

PALMYRA NEW YORK.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York:

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds

— A TEN YEAR OLD MISS was piloting a hand sled down Niagara street. The walks were slippery and the sled persisted in mixing itself with the little girl's heels. She finally fell, and a kind hearted passer hurried to her that he might assist her to arise. "Are you hurt, little one?" said he.

"I can't tell you," she replied; "mamma has cautioned me against speaking to strangers on the street, so you must excuse me."—*Buffalo Courier.*

— TEDDIE THOUGHTLESS: "That Miss Flyly told me lawst night I was half-witted, don't you know"

Van Clove (absently): "Yes; she was always a great flatterer."—*Town Topics.*

— WAITER (to Uncle Reuben): "Hard or soft shell crabs?"

Uncle Reuben: "Better let me have the soft shell; teeth ain't as good as they used ter be."—*Exchange*

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

FOLLANSBEE BROTHERS COMPANY,

Successors to

James B. Scott & Co,

The officers of the new Company are the surviving partners of the old firm.

122 and 124 Second Ave., Pittsburgh, Pa

Owners and Manufacturers of the Unrivaled

"Scott's Extra Coated" Guaranteed Roofing Tin Plate. Send for pamphlet giving description of it and fac-similes of testimonial letters of the highest order received from those best qualified to judge of its merits.

"Triumph Old Style" Roofing Tin Plate, of a little less coating than the "Scott's Extra Coated," but also made by the palm oil process.

ALSO SOLE FACTORS OF THE

BLAIRSVILLE ROLLING MILL AND TIN PLATE CO.,

Manufacturers of BLACK PLATE, CHARCOAL AND COKE BRIGHT PLATES AND ROOFING PLATES.

CHAMPION of the WORLD.

(No reference to Mr. Corbett.)

In our "PENNSYL" OLD METHOD Terne Plate we have the Champion of all Champions *Roofing Plate*, a fact which is fully borne out by **Architects, Roofers and Builders.**

When we first introduced the "Pennsyl" it was with the intention that it should *always* be the Best and Leading Brand of Roofing Tin made, and it certainly is.

Just to think, every box contains *45 lbs.* of Pure coating. Other brands that are put in competition only have 30 to 36 lbs.

Every sheet guaranteed perfect in every way.

Every sheet stamped and squared.

We put it on the market in 1879 and we have been selling it continually since.

GUMMEY, SPERING & CO.,

Manufacturers and Importers Tin Plate, Metals, &c.

PHILADELPHIA, U. S. A.

Beware of a Brand on the market *simply called* "Old Method," it is a poor imitation, and intended only *to deceive*.

ÆTNA-STANDARD IRON & STEEL CO.

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. **BRIDGEPORT, OHIO.**

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD

Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,

535 to 547 West 15th Street, New York.

A
BIG
SPRING
BUSINESS
AT
INTERESTING
PRICES.

EXTRA QUALITY BRIGHT TIN

for WASH BOILERS, IX and IXX thickness.

SIZES 14 x 26 in., 14 x 28 in., 14 x 31 in., 14 x 56 in., 14 x 60 in.

We have a good stock of various sizes of Bright Tin in IC and IX thicknesses for making FURNACE PIPE. . . . . .

MERCHANT & CO.,

. . . . . PHILADELPHIA, NEW YORK, BROOKLYN, CHICAGO, LONDON.

JOSEPH C. KENT, President. GEORGE DANBY, Sec'y and Treas.

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

TRADE-MARK AMERICA RG CLEANED.

NEW CASTLE

New Castle Steel and Tin Plate Co., New Castle, Pa.

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

THE PHILLIPS TIN PLATE CO., Philadelphia, Pa.

"F. R. P. EXTRA." Treble coated Oil Finish. Guaranteed to carry 45 lb. coating.
"PHILLIPS ROOFING." Extra heavy. Bright finish. " " 35 lb. "
"BOSTON." Heavy Spangled Terne. Guaranteed to carry 20 lb. coating.
"NATIONAL." (Worcester grade.) " " 10 lb. "

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of 40 LBS per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

THE CAMBRIDGE IRON & STEEL CO.

MANUFACTURERS OF

GALVANIZED SHEET IRON

CAMBRIDGE C I&S CO BEST TRADE MARK

BLACK SHEETS FOR ROOFING & CORRUGATING

PICKLED & COLD ROLLED FOR STAMPING

CAPACITY RANGES FROM No 30 26 INCHES WIDE, TO 14 × 40×120

CORRESPONDENCE SOLICITED

OFFICE & WORKS CAMBRIDGE, OHIO.

ILLINOIS ZINC COMPANY,

MANUFACTURERS

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

P. B. CALVERT & CO.,

IMPORTERS OF

TIN PLATES AND METALS,

Philadelphia, Pa.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices.

Brooklyn, N. Y.

BLACK DIAMOND

EXTRA TRADE MARK COATED

ROOFING PLATES

are thoroughly AMERICAN

In every respect. One trial will convince you of their superiority over anything you have ever used Send for sample and thoroughly test it. Manufactured by HENRY W. SCATTERGOOD.

Black Diamond Tin Plate Works, 51 & 53 Laurel St., Phila.

THE PHILADELPHIA STEEL ROOFING CO.

MANUFACTURERS OF

STEEL ROOFING AND CORRUGATED IRON,

514, 516 & 518 BEACH ST.

PHILADELPHIA PA.

SEND FOR CATALOGUE AND PRICES

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

PALM OIL

BRANDS:

"Cecelia" Clarified Palm,
"Lagos" Palm,
"Choice Red" Palm,
"Brown" Palm.

☞ "Cecelia" Clarified Palm Oil is prepared by us especially for Tin Plate Manufacturers, and is clarified in order to remove moisture grit, and free acid to the minimum, thus making it the safest and surest oil to use.

LAMBERT STOUGHTON & COOPER,

IMPORTERS AND PRESSERS OF OIL,

117 Walnut St., PHILADELPHIA, PA

— "When I grow up," said a little six-year old philosopher, "shan't I feel strange for a day or two?"

— The fool seeketh to pluck the fly from the mule's hind leg, but the wise man letteth the job to the lowest bidder. —*Exchange.*

The Gulf's Level Rising.

According to the engineers of the Hydrographic Bureau, the level of the Gulf of Mexico is 1 foot higher than it was in 1859, and, of course, the encroachment on the surrounding coasts has been greater or less, depending on their character. In some places, where the marginal lands are composed of high, rocky bluffs, this change of level has gone on from year to year without attracting attention. On the other hand, many low lying points (some that were once inhabited by the primitive inhabitants or by the pioneer white settlers) are entirely submerged. The cause of this change of level, says the St. Louis *Republic*, has not as yet been ascertained, but it is reasonably certain that it is the result of either a settling of the dry land or of a general and uniform rising or upheaval in the Gulf bed. No man who has given the matter a moment's thought will argue that there is more water in the Gulf now than there was 35 years ago. On the contrary, there isn't the least doubt but that there is much less. However this may be, if this aqueous encroachment is steadily maintained, Keokuk will be a deep water harbor and St. Louis and the whole Missouri will be entirely submerged in less than 40,000 years from January 1, 1895.

— The Gas Log Pretense —There is one modern convenience against which draw the line, and that is a fire place furnished with gas logs. You may sit in front of gas logs for a week and let them flame and flutter as they will and never get a spark of inspiration out of them.

"And why?" you ask. "Do they not burn gayly and show many colored flames, and are not the real logs so cunningly imitated that they might deceive a wood chopper?" "Yes," I reply, "this is true enough; but their flame is too mechanical; their logs give out no odor of the woods."

The fascination of a wood fire is that it burns by fits and starts; one flame shoots far up the chimney, the next reaches out but a few inches, and then they may all die out. That you can strike the logs with the tongs and break the flames into myriads of sparks is still another attraction. Fancy the odor if, in a fit of absent mindedness, you struck a burning gas log hard enough to break it.

I can reconcile myself to a steam radiator, because it makes no pretensions. It stands in all its gilded hideousness and throws out heat. It does not try to make you think that it is as beautiful as burning logs. It has its own place (usually the most conspicuous in the room), but it does not usurp the throne of the moss covered log.—*The Critic.*

His Leg.—There are not many men who can allow a heavy locomotive to run over one of their legs and afterward walk away uninjured, but George Munden, who claims a home in New York City, is such a man. Munden was crossing the tracks of the Reading Railroad at Allegheny avenue recently when a shifting engine, bowling along at a fair rate of speed, struck him and ran over his left leg. The engineer stopped his locomotive as quickly as possible, and he and the fireman ran back to pick up the man, whom they expected to find, at least, badly injured. They were considerably startled to see the supposed injured man limping toward them along the track.

"Are you the fellow we ran over?" asked the engineer.

"No," said Munden, "you ran over my leg."

"Well," said the engineerwith surprise, "that's part of you."

"Not exactly," said the other, "it's wooden."—*Philadelphia Record.*

ROOFING PLATES, All Grades.

BRIGHT PLATES, Charcoal and Coke.

AMERICAN AND FOREIGN.

A Large Assortment of Qualities, Weights and Sizes.

SHEET IRON. B B GALVANIZED, CHARCOAL CLEANED, COLD ROLLED, COMMON.

GALVANIZED and TERNE EAVE TROUGH and GUTTER,

CORRUGATED LEADER, ELBOWS and SHOES.

SOLDER—A Specialty, our own make.

TIN, Pig and Bar,	SHEET ZINC,
LEAD, Pig and Bar,	SHEET COPPER,
INGOT COPPER,	IRON LATHING,
ANTIMONY,	WIRE,
HARD METAL,	RIVETS.

Also a large assortment of TINNERS' TOOLS and MACHINES and a full line of other goods for spring trade.

ORDERS AND INQUIRIES SOLICITED.

BRUCE & COOK,

186, 188, 190 Water St., 248, 250 Pearl St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. Harvey's Patent Cleaned Black Iron.

Painted Corrugated Roofing and Siding.

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack, Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

Crimp

The many years this style of Roofing has been before the public amply attests its merit.



It's the best "STAY ON" Roofing ever made.

The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.

The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S. FIRST & WASHINGTON STS. JERSEY CITY, N.J.



Fine Metal Ceilings.

J. H. ELLER & CO.,

MANUFACTURERS OF

STEEL ROOFING,

Corrugated Iron Roofing and Siding,

Pressed Steel Brick and Rock Face Siding.

GALVANIZED CORNICE, WINDOW CAPS, CRESTINGS, FINIALS, ETC.

GALVANIZED STEEL EAVE TROUGH, CORRUGATED EXPANDING CONDUCTOR, EAVE TROUGH HANGERS, ETC.

Estimates Furnished for Special Designs on Short Notice.

WRITE FOR CATALOGUE AND PRICES.

Office 194 E. Fifth Street, - - - - - **Canton, Ohio.**

FRIEDLEY & VOSHARDT, 194 & 196 MATHER ST. Chicago, Ill



MANUFACTURERS OF

Sheet Metal, Zinc and Copper Ornaments

FOR

Interior and Exterior Work, Steel Ceilings, Statuary, &c

Send for Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.



The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade.

TIN AND IRON SHOW CARDS.

110 John St., - New York.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.

AMERICAN ROOFING CO.,
ST. LOUIS and CINCINNATI.

Mention this paper.



To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

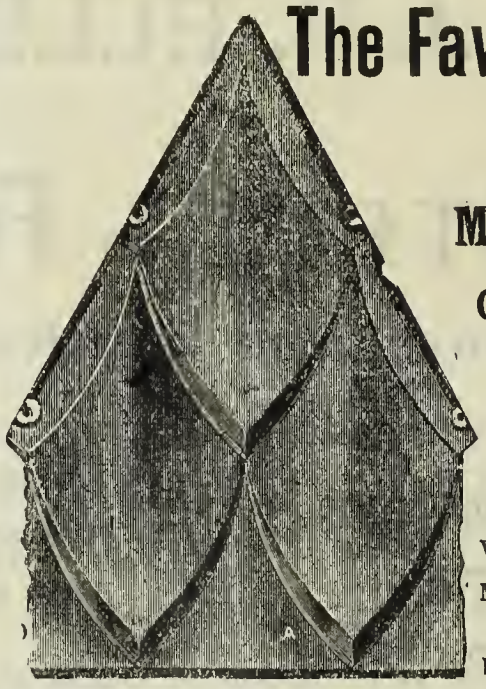
Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96 102 Reade St., New York.



The Favorite Metal Shingle

EASTLAKE.

MONTROSS PATENT.

GOTHIC and DIAMOND TILE.

Unequaled for Beauty and Excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit, Mich.
MONTROSS METAL SHINGLE CO., Camden, N. J.
E. VAN NOORDEN & CO., Boston, Mass.

HOLTON IRON ROOFING CEILING &c.
ROOFING SIDING,
NEW LISBON, O.
AGENTS WANTED EVERYWHERE

GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.
ST. LOUIS CORRUGATING CO.,
—MANUFACTURERS OF—
SHEET METAL ROOFING, SIDING AND CEILING
—OF ALL DESCRIPTIONS FROM—
SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.
Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.
Factory 113 to 133 Soulard Street, ST. LOUIS, MO.

No. 8, Large Hole. No. 12, Small Hole.
LEAD WASHERS
Full Size. CONCAVE.
FOR PUTTING ON SHEET METAL ROOFING OR SIDING.
Full Size. CONCAVE.
They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. **LITTLEFORD BROS.,** SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati, O

JOHN SANBORN,
Dealer in Metals,
and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 WATER STREET,
Near Beekman Street, NEW YORK.

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



ARRY IRON AND STEEL ROOFING CO.

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

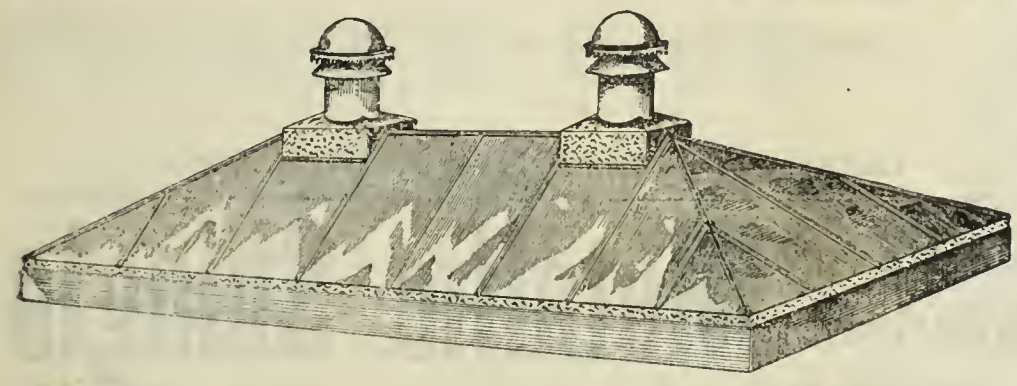
Designed for the better class of buildings, such as Residences Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.





Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

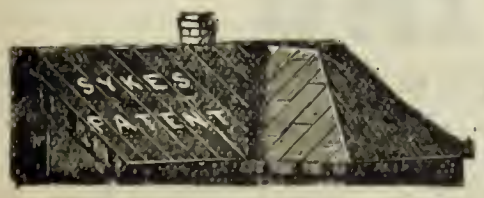
Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.



WORLD'S FAIR AWARD

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

MANUFACTURERS

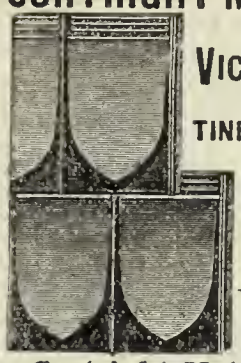


FOR

ROOFING AND SIDING.

Send for Circular and Prices.

CORTRIGHT METAL SLATES



and

VICTORIA SHINGLES

Made of

TINPLATE, (Full Weight Only)

Galvanized Steel

and

COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office. 134 Van Buren Street, Chicago.

Defy Fire and Time

WITH OUR

Steel Roofing,

Steel Ceilings, (Patented)

Corrugated Iron, Conductor Pipes, Elbows, Shoes, Eaves Troughs.

Send for illustrated catalogues and price lists, with special discount to the trade.

WHEELING CORRUGATING COMPANY,

Office and Works, Wheeling, W. Va.
Office and Warehouse, 474 Laflin St., Chicago.
Office and Warehouse, 81 Fulton St., New York.



IRON ROOF CRESTING.

Full line of new and desirable designs.

S. GREEN & SONS, Des Moines, Ia.

Architectural
Sheet Metal
Work.

Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.

ELBOW CHART

—FOR—

TIN and SHEET IRON WORKERS,

Giving the Rise of the Miter Line of Elbows of any Diameter and Number of Pieces and for any Angle.

This is one of the best and most practical systems for producing elbow patterns, for the use of all light or heavy sheet metal workers. It is simple, accurate and most valuable, being the only *thumb* rule ever produced from which accurate results may be expected. Every good workman has some rule by which he may develop a satisfactory pattern for Elbows at right angles, but when something different is wanted, it is a little trouble. By the use of this chart he can safely depend on getting a correct pattern for any elbow no matter of what diameter, number of pieces, or angle, and mark it out direct on his strip of iron or tin, almost as quick as if he had a pattern. This chart has more combinations and measurements than may be counted, and will be a great help to young or old at the business.

PRICE, 50c. BY MAIL.

DAVID WILLIAMS.

PUBLISHER and BOOKSELLER,

96-102 Reade Street, - New York.

— A GREAT MAN.—The resident was showing the visitor the sights of the town, when they passed a distinguished looking citizen.

"Did you notice that man we just passed?" asked the resident.

"That fine looking one?"

"Yes. Well, he can draw his check for a million dollars."

The visitor turned around to get a better look at such a rarity.

"Can he get it cashed?" he asked quietly, and the resident appeared to feel hurt.—*Detroit Free Press.*

— A MAN on Third street, who has an impediment in his speech, was heard saying: "B b-b-boy, kick kick-kick call that p-p-pup off! D d-d-do you h-h-hear me?"

"Dere ain't no pup, mister. E's grown into a dog since you began talking."—*Louisville Gem.*

For

SHEET METAL

SKYLIGHTS,

Get prices from

James A. Miller & Bro.,

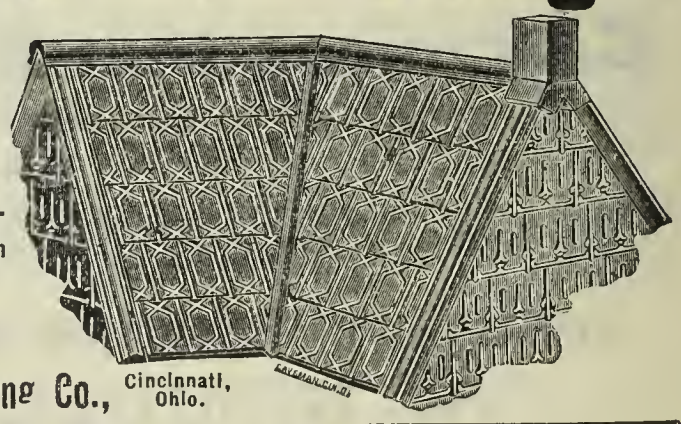
129 and 131 South Clinton St., Chicago.

They think that for a good skylight they can make a little lower price than can any of their competitors.

Catalogues and prices on application.

THE REAGAN Metallic Shingle

Absolutely water proof.
Easily applied.
Cheap.
Will last a lifetime.
Can be laid by any one.
Superior to slate and unsurpassed in appearance when laid.
Write for terms.



The Cincinnati Stamping Co., Cincinnati, Ohio.

ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.



Queen City Shear, with Holddown, and Improved Back Gauge.

NIAGARA

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

A FULL LINE.

The Best and Most Improved

ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

CORNICE MAKERS' TOOLS.

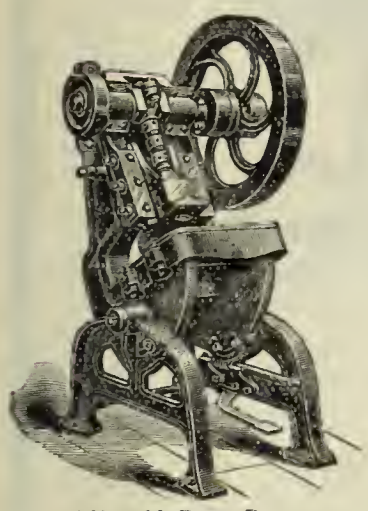
PRESSES AND DIES.

Squaring, Slitting and Circle Shears.

Complete Outfits for making Tinware, Cans and other Sheet Metal Goods.

——MANUFACTURED BY——

The Niagara Stamping & Tool Co.,



Adjustable Power Press.

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**

Ferracute Machine Co.,

BRIDGETON, N. J., U. S. A.,

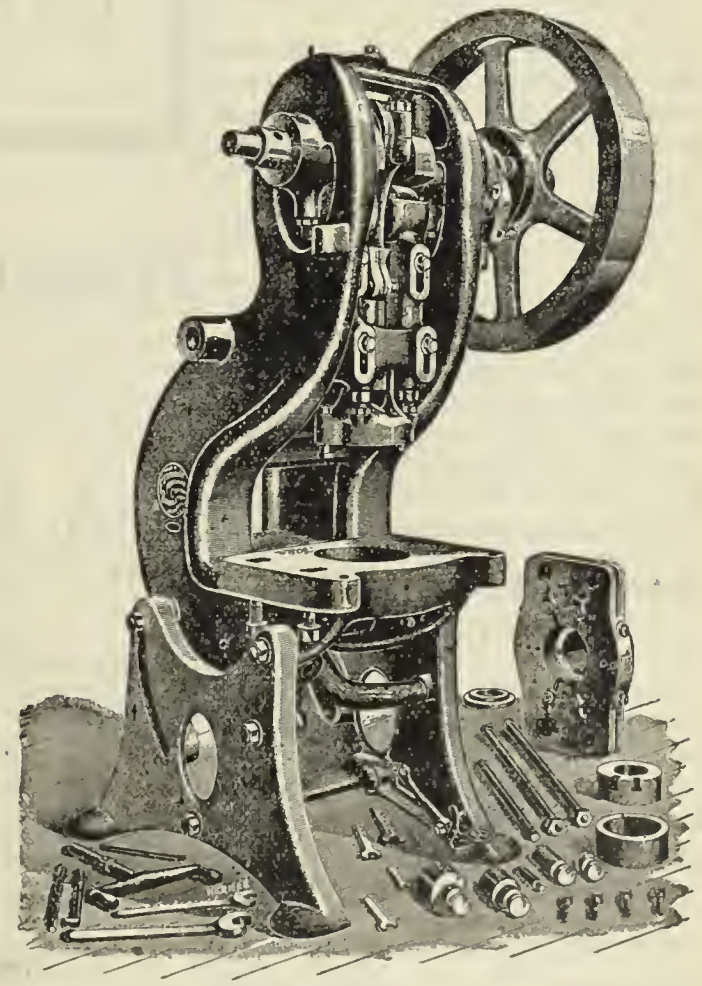
MANUFACTURERS OF

FOOT AND POWER

PRESSES, DIES

And other SHEET METAL TOOLS

OF ALL KINDS.



Please send for Illustrated Price-Lists describing **300 kinds** Presses, every kind of Dies, Tinners Tools, Solder Apparatus, &c., for the manufacture of **Cans, Tinware, Sheet Iron Goods, Lamps, Gas Fixtures and other Brass Goods, Silverware, Hardware and other Iron Goods of every kind.**

Six sizes of New "Style C" Inclinable Presses, Heavy, Handsome, Durable and Very Popular.

TINNERS' MACHINERY AND SUPPLY CO.,

SUCCESSORS TO

HIBBERD & SPINNER,

Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery, Presses, Dies and Can Makers' Tools.



FULL LINE OF SUPPLIES.

9 CLIFF STREET, NEW YORK CITY.

— "When I was down in Texas," said the returned drummer, "I found just one busy man. He had the salt rheum and a Waterbury watch. When he wasn't scratching himself he was winding his watch."—*Chicago Tribune.*

— A Slippery Subject. — Baggs: "What remark did Jaggs make when he sat down on the icy pavement last night?"

Gaggs: "He said he wondered why water always freezes with the slippery side uppermost."—*Exchange.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstrat on is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

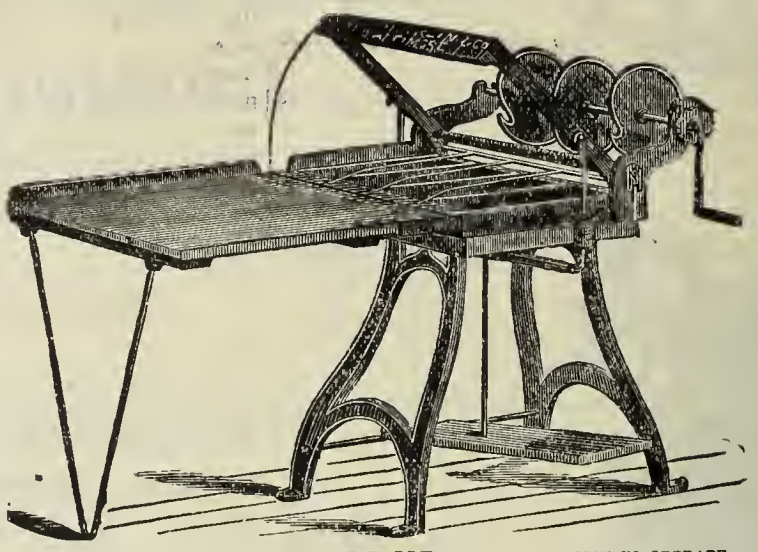
Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

☞ *First, for Rapidity of Work.*
Second, for Quality of Work.
Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

LYON, CONKLIN & CO.,

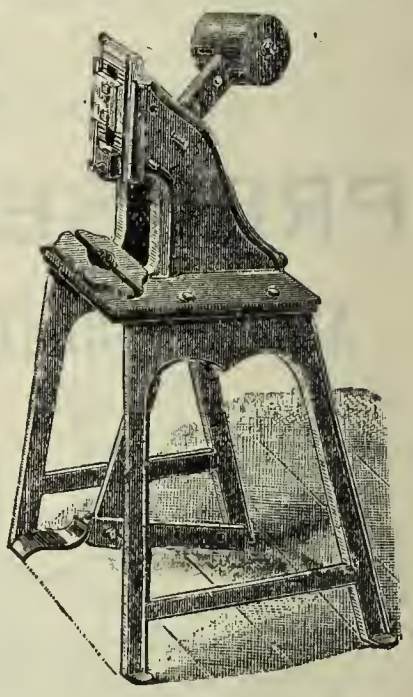
Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.

—OUR—

PENDULUM PRESSES

are suitable for a wide range of work. Grooved beds with sliding bolts for holding all sizes of dies. Perfectly fitted balanced, and adjustable to light and heavy blows. A first class machine in every respect.



MANUFACTURED BY

G. A. Crosby & Co.,

176 & 178 So. Clinton St., CHICAGO, ILL., U. S. A.,

DESIGNERS AND BUILDERS OF

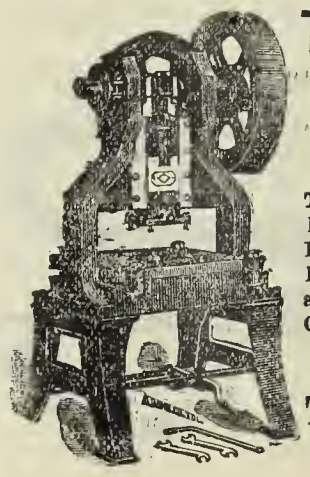
Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap Makers', and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Brass Goods and all Hardware Novelties.**

Special Attention to Dies of every Description.

WORK GUARANTEED THE BEST.

Write for Prices and New Catalogue containing full line of Tinners' Tools.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.



The Toledo Machine & Tool Co.,

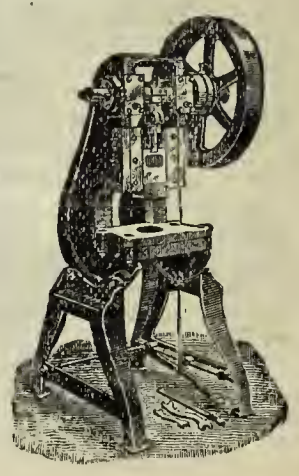
MANUFACTURERS OF

Power Punching Presses, Drop Presses Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

Send for Catalogue now being Printed.

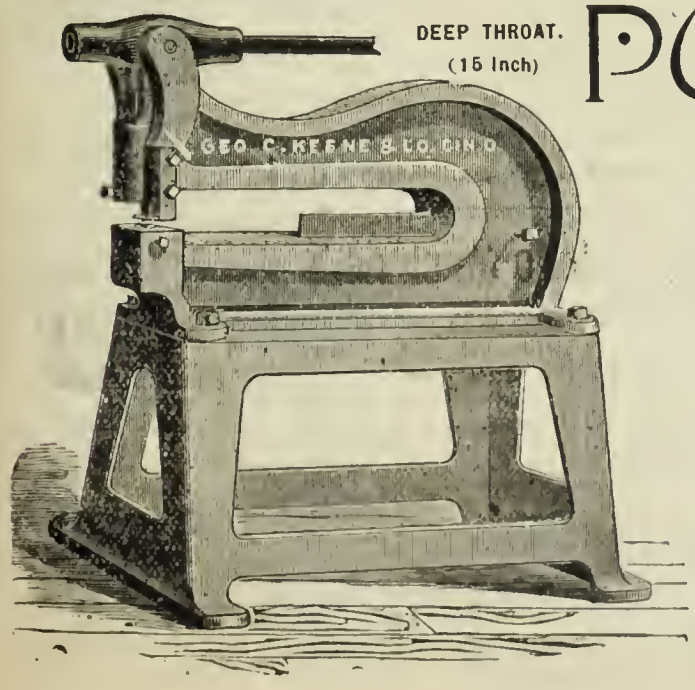
The Toledo Machine & Tool Co.

Superior and Oak Sts., Toledo, O.



ALPHABETICAL LIST OF ADVERTISERS.

Acme Roofing & Supply Co.. 82
Ætna Standard Iron & Steel Co 77
American Boiler Co..... 22
American Radiator Co..... 1
American Roofiug Co..... 82
American Sbeet Iron Co..... 78
Apollo Iron & Steel Co 1
Armstrong Mfg. Co..... 68
Anld & Conger..... 73
Aurora Vapor Stove Co..... 9
Bailey-Farrell Mfg. Co..... 68
Bangor Excelsior Slate Co.. 75
Barstow Stove Co..... 92
Bascom, H. Clay.. 66
Belden, F. E. Mica Mining Co..... 23
Belding Mfg. Co .....24&25
Bellaire Stamping Co..... 60
Berger Bros..... 75
Berger, L. D..... 81
Blhb. B C. Stove Co..... 17
Black Diamond Tin Plate Works..... 79
Bliss, E. W. Co..... 90
Blodgett, G. S. Co..... 58
Bowen Mfg. Co..... 26
Bowers Roofing & Metal Wks 73
Brauer, A. G..... 66
Bridgeport Crucible Co..... 65
Brombacher's Sons, Jacob .. 91
Bruce & Cook.....57, 80&92
Buffalo Register Works..... 26
Burton, W. J. & Co..... 82
Calely, Ed. L..... 66
Calvert, P. B. & Co..... 79
Cambridge Iron & Steel Co.. 78
Canfield, H. O..... 71
Canton Steel Roofing Co..... 84
Carton Furnace Co 3
Central Pattern Works..... 68
Central Stamping Co..... 61
Chamberlain, J. W. Co..... 74
Cheney, S. & Son. .. 69
Chicago & Erie Stove Co..14&16
Cincinnati Corrugating Co.. 81
Cincinnati Stamping Co..... 84
Clad, V. & Sons..... 22
Clark, G. M. & Co..... 7
Clark Novelty Co.... 73
Clark, Quien & Morse ... 72
Clayton & Lambert Mfg. Co. 70
Clifton Springs Mfg. Co..... 62
Columbus Brass Co..... 69
Colwell Lead Co..... 71
Connecticut Plating Co..... 65
Cooney, Seiner & Co..... 72
Cope, Geo. W. 66
Corning Mfg. Co..... 17
Correspondence School of Mechanics..... 57
Cortright Metal Roofing Co. 83
Couch Bros. Mfg. Co..... 69
Covert Mfg. Co..... 67
Craig-Reynolds Fdy. Co..... 16
Crosby, G. A. & Co..... 86
Curtis & Curtis..... 68
Dalton-Ingersoll Co..... 70
Dixon, Jos., Crucible Co..... 75
Douglas, W. & B..... 68
Dover Machine Works..... 87
Eddy Electric Mfg. Co..... 67
Electric Boiler Co..... 17
Eller, J. H. & Co..... 81
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 75
Ferracute Machine Co..... 85
Ferrosteel Co..... 23
Follansbee Bros. Co..... 76
Foskett & Bishop Co.. 88
Fostoria Steel Roofing Co... 83
Frink, I. P..... 92
Friedley & Vosbardt..... 81
Froelich, A., Estate of..... 65
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 75
Garry Iron & Steel Roofing Co..... 83
Geuder & Paeschke Mfg. Co. 63
Giblin & Co..... 19
Glenmore Foundry & Machine Co..... 20
Globe Iron Roofing & Corrugating Co..... 83
Globe Ventilator Co..... 66
Gobeille Pattern Co..... 66
Gordon, W. J..... 90
Gorton & Lidgerwood Co..... 1
Graff & Co..... 16
Greene, W. F 59
Green, S. & Sons..... 83
Griswold Mfg. Co..... 61
Gummey, Spering & Co..... 77
Gurney Heater Mfg. Co..... 19
Gurney Refrigerator Co..... 26
Halliday, M 83
Hamilton, John..... 92
Hanson & Van Winkle Co... 67
Hart & Crouse..... 20
Hartford Hollow Ware Co . 59
Haslet, Flanagen & Co..... 60
Hees, Snyder & Co..... 21
Highland Foundry Co..... 1
Higbton, Wm. & Sons..... 23
Holton Iron Roofing Co..... 82
Howard Furnace Co..... 28
Howard Thermostat Co..... 22
Howson & Howson..... 58
Hull, M. L..... 69
Illinois Zinc Co..... 78
Indiana Ladder Co..... 62
Iwan Bros..... 64
Jackson's Sons, W..... 22
Jenkins Bros..... 1
Jersey City Galvanizing Co. 74
Johnson, E. J. & Co 75
Jones, L. B. 10
Kanneberg Roofing Co..... 73
Kansas City Metal Roofing & Corrugating Co..... 84
Keene, Geo. C. & Co..... 87
Kelly, Thos. & Bro..... 70
Kemp, C M Mfg. Co 73
Kendrick Valve & Wasber Co..... 59
Kernan Furnace Co..... 5
Keuffel & Esser Co..... 59
Kewanee Boiler Co..... 18
Kieckhefer Bros. & Co..... 61
Kieley, T.. 1
Kilbourne & Jacobs Mfg. Co. 70
Lambert, Stoughton & Cooper 79
Lawrence-Letts Elbow Co... 74
Lighting Dasber Egg Beater Co..... 60
Lindemann, A. J. & Hoverson Co..... 9
Littleford Bros..... 82
Lufkin Rule Co..... 90
Lyon, Conklin & Co.... 86
McClure & Co..... 92
McDaniel & Harvey Co..... 80
McLaughlin, J. K..... 66
Mahony, M..... 18
Marcy Stove Repair Co..... 65
Marlin & Co..... 72
Marston, I. G. & Co..... 71
Mason Regulator Co..... 1
May & Fiebeger 15
Merchant & Co., Inc..... 78
Merry, Geo. E..... 77
Meurer Bros. Co..... 79
Mica Mfg. Co..... 58
Michigan Vapor Stove Co... 10
Millar, Chas. & Son... ... 92
Miller, Jas. A. & Bro..,....83&84
Miner & Peck Mfg. Co.. ... 90
Montross Metal Shingle Co.. 82
Mowry, W. C..... 22
Mullins, W. H..... 83
Munsell, E. & Co... 23
Myers, F. E. & Bro..... 68
National Wringer Co..... 63
Newark Regulator Co..... 71
New Castle Steel & Tin Plate Co..... 78
New York Central Iron Wks. 17
New York Elbow Co..... 60
New York Iron Roofing & Corrugating Co..... 81
New York Nickel Plating & Mfg. Co 61
Niagara Stamping & Tool Co. 85
Niles Mfg. Co..... 63
Ohdyke, W. A. & Co..... 72
Obermayer, S. Co 65
Ohl, Geo. A. & Co 90
Osborn, J. M. & L. A..... 68
Ostrander, W. R. & Co..... 82
Packard Enameling Co..... 62
Page Boiler Co., Wm. H..... 22
Palermo Mica Co.... 23
Pancoast, Henry B. & Co.... 74
Paxson, J. W. & Co..... 65
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co 68
Peck-Williamson Heating & Ventilating Co..... 21
Peninsular Stove Co.....11
Phelps, Dodge & Co 76
Philadelphia Steel Roofing Co..... 79
Phillips Tin Plate Works.... 78
Pontyminster Old Style Ternes..... 78
Poorman Mfg. Co..... 91
Portsmouth Stove & Range Co..... 14
Preshrey Stove Lining Co... 66
Proudman Bros..... 72
Putnam Foundry & Machine Co 20
Republic Iron Works, ... 79
Ringen Stove Co..... 2
Robinson, J. M. & Co 91
Rochester Stamping Wks.... 62
Rome Mfg. Co..... 64
Root, A. L..... 75
Rutland Fire Clay Co..... 66
St. Louis Corrugating Co.... 82
St. Louis Stamping Co..... 64
S S. S. Conductor Co..... 73
Salem Nail Co 75
Sanborn, John..... 82
Saunders' D. Sons..... 71
Savill, Walls & Co..... 74
Sayre Stamping Co..... 59
Schaffer, J. P. 18
Schneider & Trenkamp Co.. 8
Severding, John..... 74
Sheppard, Isaac A & Co.1,12&13
Shirk Refrigerator Co..... 26
Silver & Co 64
Sims Mfg. Co. 74
Smith & Anthony Co 27
Smith & Winchester Co..... 20
Smith Co., H. B.. 18
Smith, J. D. Foundry Supply Co 66
Souther, E. E. Iron Co.. ... 78
Special Notices..... 57
Sperry, D. R. & Co . . 64
Sproul & McGurrin 68
Standard Lighting Co..... 6
Star Mfg. Co..... 60
Stebbins, E. Mfg. Co..... 71
Steel Clad Bath Co..... 71
Stellwagen & Kynoch..... 59
Stiles & Parkor Press Co.... 90
Stocking, E. B. 58
Stuart & Peterson Co..... 71
Superior Steel Range Co.... 23
Sykes Iron & Steel Roofing Co 83
Taplin, Rice & Co..... 14
Tarbox Mfg. Co. 65
Taylor Co., N. & G 92
Tinners' Machinery & Supply Co. 85
Tinplate Decorating Co..... 81
Toledo Machine & Tool Co.. 86
Trethaway Bros 62
Troy Nickel Works..... 23
Troy Oil Stove Co..... 26
Tuttle & Bailey Mfg. Co..... 27
Union Heater & Supply Co.. 69
United States Heater Co.... 18
Valentine, M. D. & Bro. Co... 63
Van Namee, G. L. Mfg. Co.... 59
Van Noorden, E. & Co. 82
Vedder Pattern Works..... 66
Vogel, William & Bros..... 63
Waltber & Christman..... 72
Warren Hardware Co..... 4
Washburne, E. G. & Co..... 66
Wayne, Jos. W..... 26
Weatbered's, Thos. W. Sons 19
Wheeling Corrugating Co... 83
Wilson, R M..... 71
Wister, L. & R. & Co..... 92
Wolff, L. Mfg. Co..... 69
Wood, Alan Co..... 80
Wood Co., W. Dewees..... 92
Yates & Co..... 57
Zero Valve Co..... 73
Zucker, Levett & Loeb Co... 67



DEEP THROAT.
(15 Inch)

PUNCH.

Double Action.

Strong, easy of operation, cheap. Will punch ¼ inch hole through No. 10 iron or steel and lighter.

GEO. C. KEENE & CO.,
Mfrs The Keene Brake
CINCINNATI, - OHIO.

PRESSES, DIES AND TOOLS
For Can and Tinware Manufacturers.
Dies for Cutting, Drawing & Stamping Tinware
Estimates given at sight of samples of drawing work.
Send Sample for Prices before ordering elsewhere.
DOVER MACHINE WKS, Dover, Del.

THE ENGLISH AND AMERICAN MECHANIC:

An Every-day Hand-Book for the Workshop and the Factory.

CONTAINING

SEVERAL THOUSAND RECEIPTS, RULES AND TABLES INDISPENSABLE TO THE MECHANIC, THE ARTISAN AND THE MANUFACTURER.

By VAN CLEVE and EDWARDS.
500 Pages, Cloth, $2.00.
Sent, postpaid, upon receipt of price, by
DAVID WILLIAMS, 96-102 Reade St. N.Y.

CLASSIFIED LIST OF ADVERTISERS.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield, H. O., Bridgeport, Conn.

Bathtubs.
Dalton-Ingersoll Co., Boston, Mass.
Peck Bros. & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 Wes 28th St., N. Y.
Stuart & Peterson Co., Phila., Pa.
Wilson, R. M., Rome, N. Y.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N.J.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn. N. Y.

Castings.
Cheney, S. & Son, Maulius, N. Y.

Ceilings, Metallic.
Eller, J. H. & Co., Canton, O.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Cement.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing & Supply Co., Cantou, O.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Cincinnati Corrugatiug Co., Piqua, Ohio.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A. & Bro., Chicago, Ill.
Obdyke. W. A. & Co., Philadelphia, Pa.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford, Conn.

Copper, Roofing and Cornice.
Gummey, Sperlug & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Ferracute Machine Co., Bridgeton, N.J.
Keene, Geo. C. & Co., Ciuciunati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robiuson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.

Cream Can Fittings.
Geuder & Pacschke Mfg. Co. Milwau kee, Wis.

Crestiug.
Green, S. & Son, Des Moincs, Iowa.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Coouey, Selner & Co., Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Cauton, Ohlo.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Dinner Pails,
Trethaway Bros., Parsons, Pa.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haveu, Ct.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Cantou, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing & Supply Co., Cauton, O.
Berger Bros., Philadelphia, Pa.
Clark. Quien & Morse, Peoria, Ill.
Proudman Bros., Meriden, Conn.
Severdiug, Jno., Richmond, Ind.
Walther & Christman, Cleveland, O.

Egg Beaters.
Lightning Dasher Egg Beater Co., Toledo, Ohio.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N Y.

Electric Dynamo Mchines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winckle Co., Newark, N.J
Zucker, Levett & Loeb Co., 8-14 Grand St., New York.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodhridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Foundry Facings Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittshurgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co.. Corning, N. Y.
Craig-Reynoids Foundry Co., Dayton Ohio.
Foskett & Bishop Co., 114 Liberty St., N. Y.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
May & Fiebeger, Akron, Ohio.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Peck, Williamson Heating and Ventilating Co., Cincinnati, O.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.

Furnaces, Plumbers' and Tinners'.
Claytou & Lambert Mfg. Co., Ypsilanti, Mich.
Couch Bros., Mfg. Co., Dayton, Ohio.
Hull, M. L., Cleveland, O.
Union Heater Supply Co., Detroit, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Kent, C. M. Mfg. Co., Baltimorc, Md.

Granite Ware.
St. Louis Stampiug Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.
Packard Enameling Co., Warren, O.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y.
Poorman Mfg. Co., Canton, Ohio.

Heaters, Steam and Hot Water.
American Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Foskett & Bishop Co., 114 Liberty St., N. Y.
Fuller & Warren Co., Troy, N. Y.
Glenmore Foundry & Mch. Co., Phila., Pa.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Mahouy, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geueva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Smith Co., H. B., 137 Centre St., N. Y.
Smith & Anthony Co., Boston, Mass.
Smith & Winchester Co., Boston, Mass.
United States Heater Co., Detroit, Mich.
Weathered's, Thos. W. Sons, 139-143 Centre Street, New York.

Hollow Ware.
Bellairc Stamping Co., Harvey, Ill.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Stuart & Peterson Co., Philadelphia, Pa.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Silver & Co., Brooklyn, N. Y.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Repuhlic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalamelned.
Repuhlic Iron Works, Pittshurgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Irou Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Piqua, Ohlo.
Gummey, Sperlng & Co., Philadelphia, Pa.
Lyou, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Irou Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Lacquers and Japans.
Hanson & Van Winkle Co., Newark, N. J.

Ladders.
Indiana Ladder Co., Indiana, Pa.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.

Metallic Lathing.
Jersey City Galvanizing Co., 112 John St., N. Y.

Metals.
Sanhorn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Obermayer, S. & Co., Cincinnati, Ohio.
Smith, J. D. Foundry Supply Co., Cinciunati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand Street, New York.

Oil Cans.
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges, Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Palm Oil.
Lambert, Stoughtou & Cooper, Phila., Pa.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L. Philadelphia, Pa.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, John K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Pheips, Dodge & Co., 11 Cliff St. N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Plating Co., Phila., Pa.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers' Slate.
Fairhaven Marble & Marhleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lamhert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Hull, M. L., Cleveland, O.
Kelly, Thos. & Bros., Chicago, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohlo.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
Sproul & McGurrin, Grand Rapids, Mich.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Union Heater Supply Co., Detroit, Mich.
Wilson, R. M. Rome, N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works. Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumping Machines.
Columbus Brass Co., Columhus, Ohio.

Pumps, House and Farm.
Douglas, W. & B., Middletown, Conn.
Hess, Snyder & Co., Massillon, O.
Myers, F. E. & Bro., Ashlaud, O.

Punching Machines.
Croshy, G. A. & Co., Chicago, Ill.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water.
American Radiator Co., Chicago, Ill.
Exeter Machine Works, Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., N. Y.

Refrigerators.
Belding Mfg. Co., Belding, Mich.
Bower Mfg. Co., Fond du Lac, Wis.
Gurney Refrigerator Co., Fond du Lac, Wis.
Shirk Refrigerator Co., Chicago, Ill.
Wayne, Jas. W., Cincinnati, Ohlo.

Registers.
Buffalo Register Works, Buffalo, N. Y.
Ferrosteel, Clevelaud, O.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman Street, New York.

Report Blanks.
Salesmeu's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N.Y.
Silver & Co., Brooklyn, N. Y.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixou, Jos. Crucible Co., Jersey City N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel, Corrugated and Plain.
Acme Roofing & Supply Co., Canton, O.
American Roofing Co., Cincinnati, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O,
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, O.
Globe Iron Roofiug & Corrugatiug Co., Ciucinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lishon, O.
Kanneverg Roofing Co., Canton, O.
Kansas City Metal Roofing & Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
St. Louis Corrugating Co., St. Louis, Mo.
Souther, E. E. Iron Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGE 87.

Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Lyon, Conklin & Co., Baltimore, Md.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Bromhacher's Sons, Jacob, 30 Cliff St., N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover. Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co., Toledo, O.

Shingles and Tiles, Metallic.
Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Wolff, L. Mfg. Co., Chicago, Ill.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.

Slaters' Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Couch Bros. Mfg. Co., Dayton, Ohio.
Union Heater Supply Co., Detroit, Mich.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Steam & Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Pattern.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Ceutral Pattern Works, Dayton, Ohio.
Cope, G. W., Detroit, Mich.
Gobelile Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Stellwagen & Kynoch, St. Ignace, Mich.
Van Namee, G. L. Mfg. Co., Gouverneur, N. Y.

Stoves and Ranges.
Bibb, B. C. Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
Clad V. & Sons, Philadelphia, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co., Boston, Mass.
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Superior Steel Rauge Co, Cleveland, Ohio.
Taplin, Rice & Co., Akron O.
Warren Hdw. Co., Warren, Ohio.

Stoves and Ranges, Gas.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Jones, L. B., St., Louis, Mo.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.
Aurora Vapor Stove Co., Cleveland, O.
Barstow Stove Co., Providence, R. I.
Clark, Geo. M. & Co., Chicago, Ill.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Michigan Vapor Stove Co., Grand Rapids, Mich.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lightlug Co., Cleveland, O.
Troy Oil Stove Co., Troy, N. Y.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Pattern Rules.
Lufkin Rule Co., Saginaw, Mich.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Black Diamond Tin Plate Wks., Phila., Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Oshorn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila. Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Kieckhefer Bros. & Co., Milwaukee, Wis.

Tinware, Anti-Rustless.
Clifton Springs Mfg. Co., Clifton Springs, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Acme Roofing & Supply Co., Canton, O.
Berger, L. D., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Bromhacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N.Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover. Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, Geo. A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.

Torches, Plumbers' and Tinners.'
Kendrick Valve & Washer Co, Syracuse. N. Y.

Traps and Vents.
Sproul & McGurrin, Grand Rapids, Mich.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Kemp, C, M. Mfg. Co., Baltimore, Md.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 87.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA, AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - - -	$1.00	SIX MONTHS, - - - - - - -	$22.10
ONE MONTH (5 Times), - - - - -	5.00	ONE YEAR, - - - - - - - -	40.30
THREE MONTHS, - - - - - - -	12.35		

Rates for larger spaces quoted on application.

DAVID WILLIAMS, Publisher.

96, 98, 100 and 102 Reade Street, NEW YORK. — **59 Dearborn Street, CHICAGO.**

New York (Main Office), - -	96-102 Reade Street, - - - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509 Hamilton Building, - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - - -	59 Dearborn Street, cor. Randolph, - - - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - - -	HENRY SMITH, Manager.
St. Louis, - - - - - -	Bank of Commerce Building, - - - - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.
AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

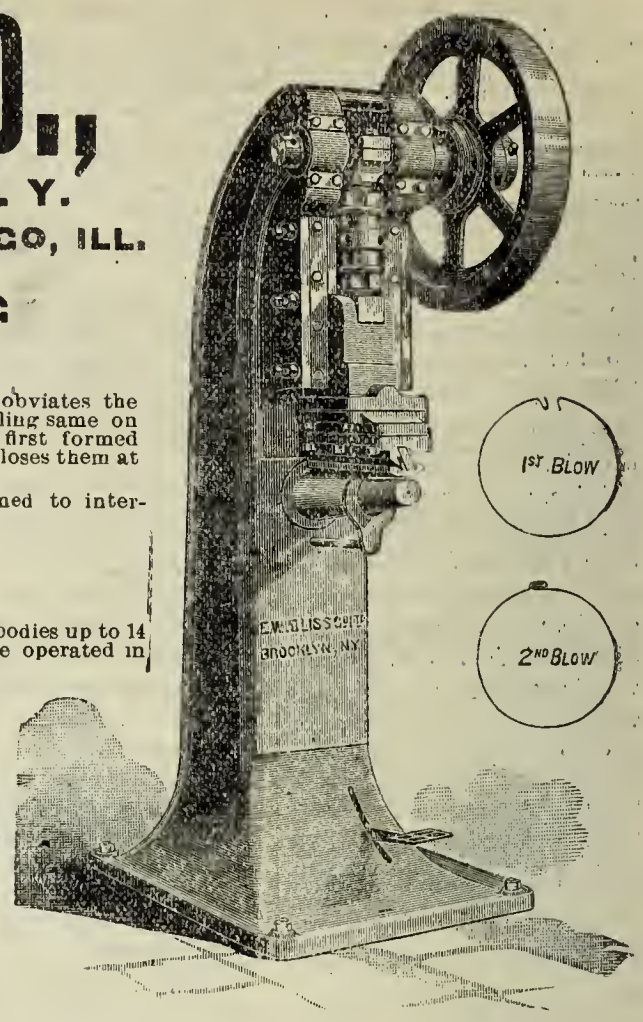
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.

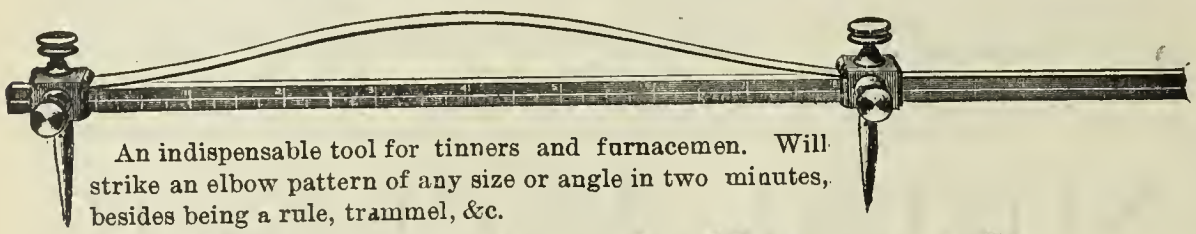


PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

DIES, SPECIAL MACHINERY &c.

THE STILES & PARKER PRESS CO.



An indispensable tool for tinners and furnacemen. Will strike an elbow pattern of any size or angle in two minutes, besides being a rule, trammel, &c.

"MAGIC" PATTERN RULE.

Price Reduced to $3.50 Net Cash.

Complete with Chart. Will pay for itself in a short time.

Send for Descriptive Circular.

LUFKIN RULE CO.,

SAGINAW, MICH.



— NOT UNREASONABLE.—BOY: "You are advertisin' for an errand boy?"

Skinner (of Skinner & Co.): "Yes, we have a vacancy."

"Hours long?"

"You'll have to work 16 hours a day."

"Yes?"

"And you must have a bicycle, so as to save time."

"I've got one. How about pay?"

"Well, we'll pay you—let—me—see—"

"Say, Mister, make it enough to keep the bicycle in repair, won't you."—*Street & Smith's Good News.*

— A LAZY man never gets ahead unless some one puts one on him.—*Boston Bulletin.*

— NEW POLICEMAN: "And where is your permit to peddle?"

Peddler: "I have a verbal permit."

New policeman: "Show it to me."—*Texas Siftings.*

GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co.,

157, 159, 161 Oraton St., Newark, N. J., [Telephone 873]

Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892. Send for our illustrated catalogue.

PATENT AUTOMATIC CAN BODY SEAMERS.

COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.

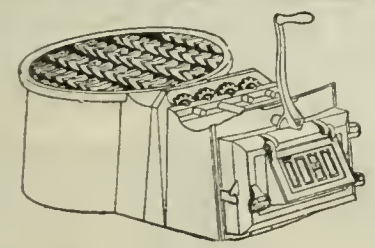
W. J. GORDON, 218 New St., PHILADELPHIA, PA.

Carton

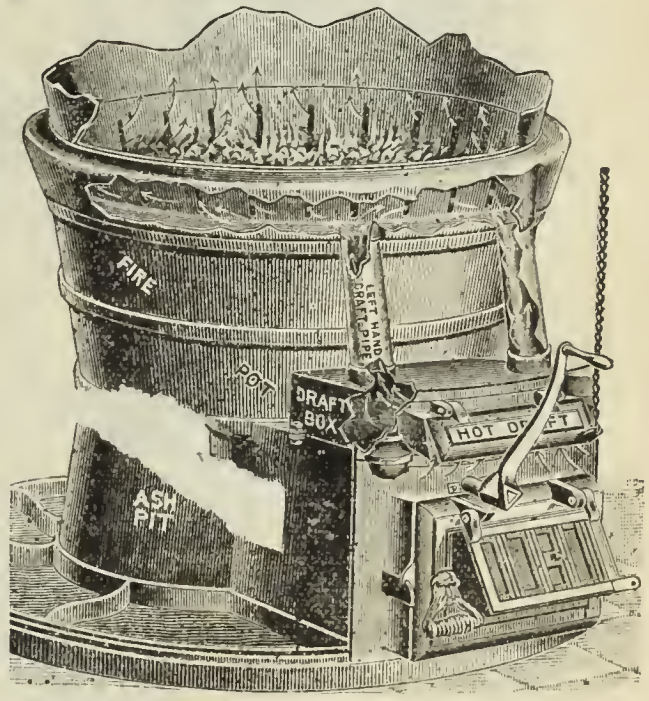
Hot Water & Steam Boilers & Furnaces.

OUR SOFT COAL SMOKE CONSUMER FURNACE.





Original "Smyth" Revolving Anti-Clinker. Grates.



Vertical Combustion Flues.

A Side Draft Furnace.

Large Combustion Chamber.

Perfect Combustion.

PRICES TO SUIT THE TIMES.—Our Catalogue and Prices will interest you.

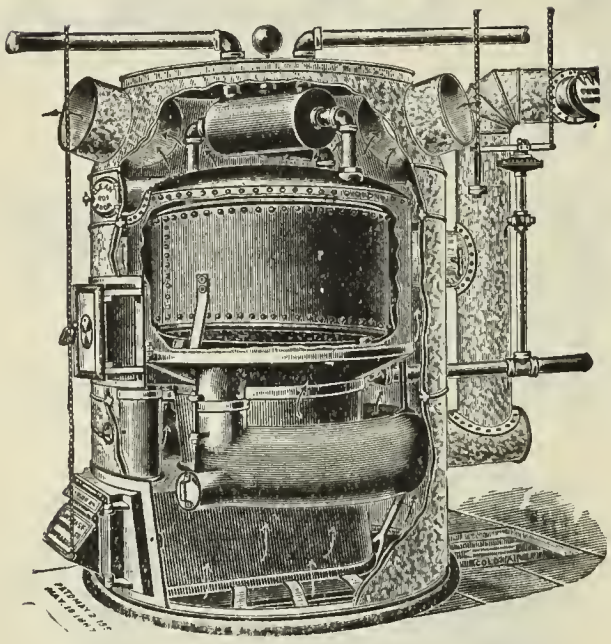
MANUFACTURED BY

CARTON FURNACE CO., UTICA, N. Y.

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

THE

Warren Steel Range

&c.

IMPORTANT ANNOUNCEMENT.

To Jobbers and Retailers of Steel Ranges:

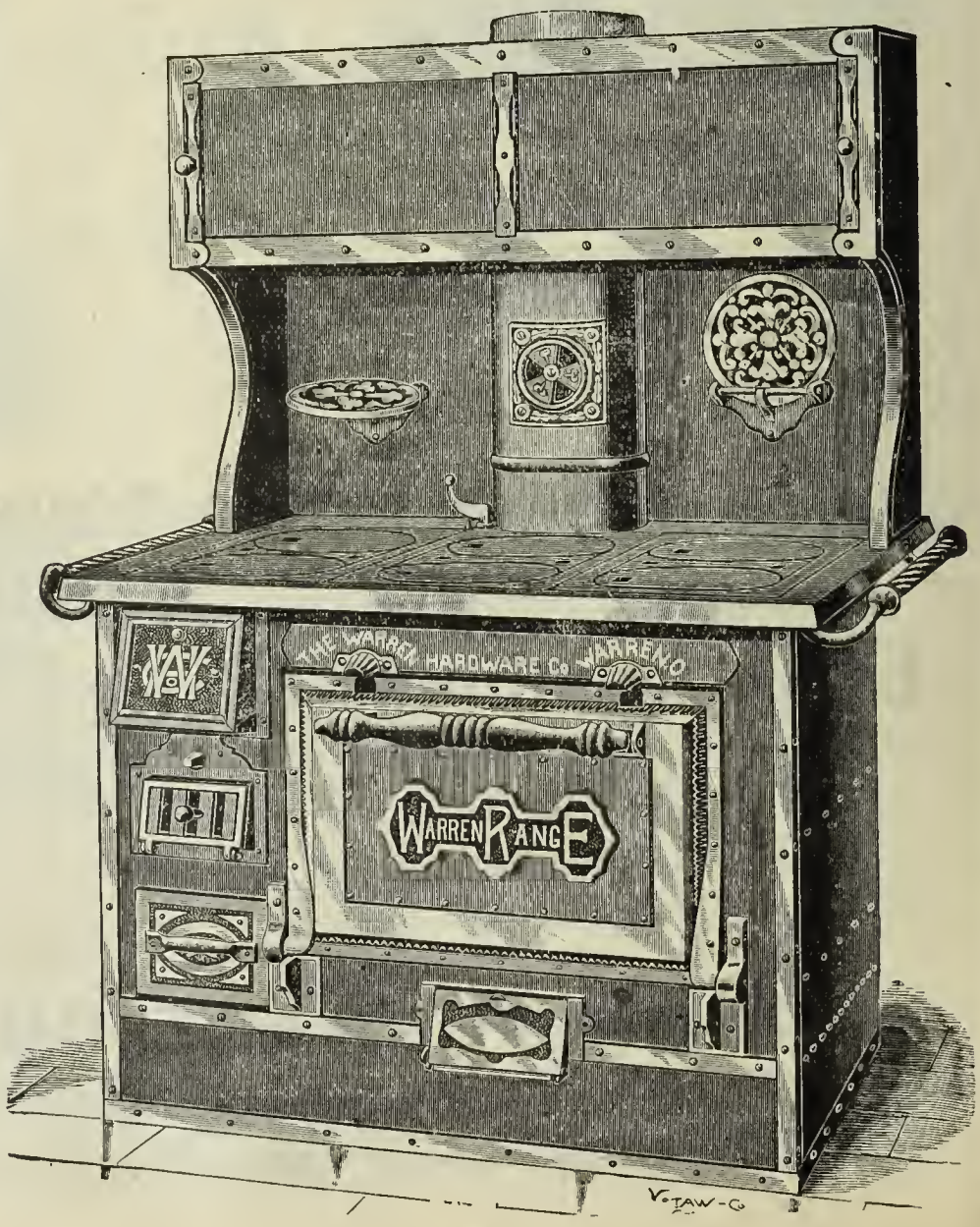
Don't fail before placing your order for Steel Ranges to get catalogue and prices on our new line of Warren Ranges for 1895. New and original and the finest line of Ranges on the market. With Duplex Grate to draw out front of range without disturbing fire linings. Full size opening of oven 18 x 20 x 14, 20 x 22 x 14 and 22 x 23 x 14. Lined throughout with asbestos. Write for prices and catalogue.

MANUFACTURED BY

THE WARREN HARDWARE CO.

7 Market Street,

WARREN, OHIO.

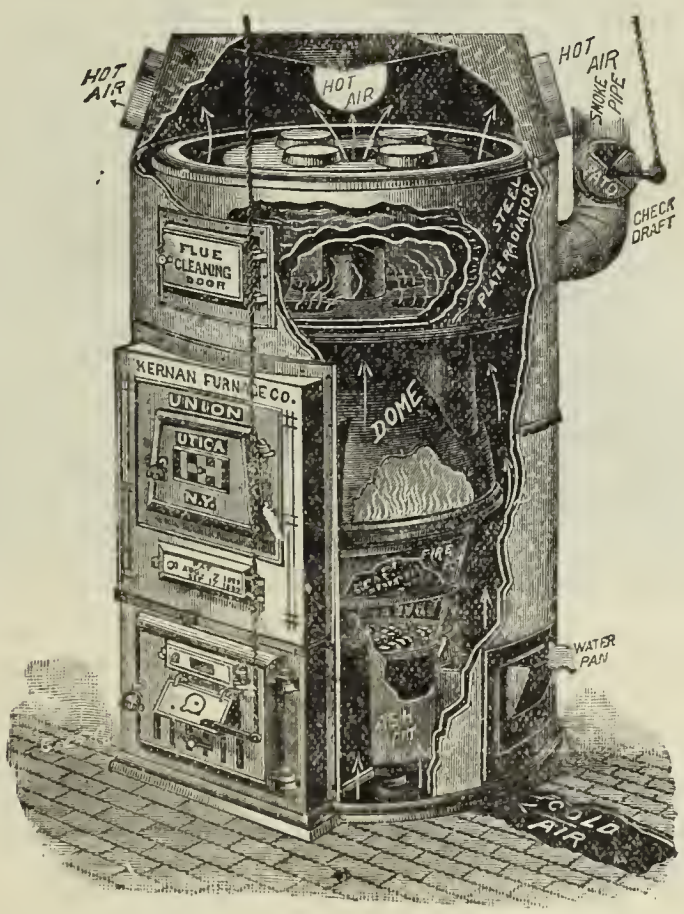


KERNAN

Union Furnace.

Good Thing.

Push It Along.

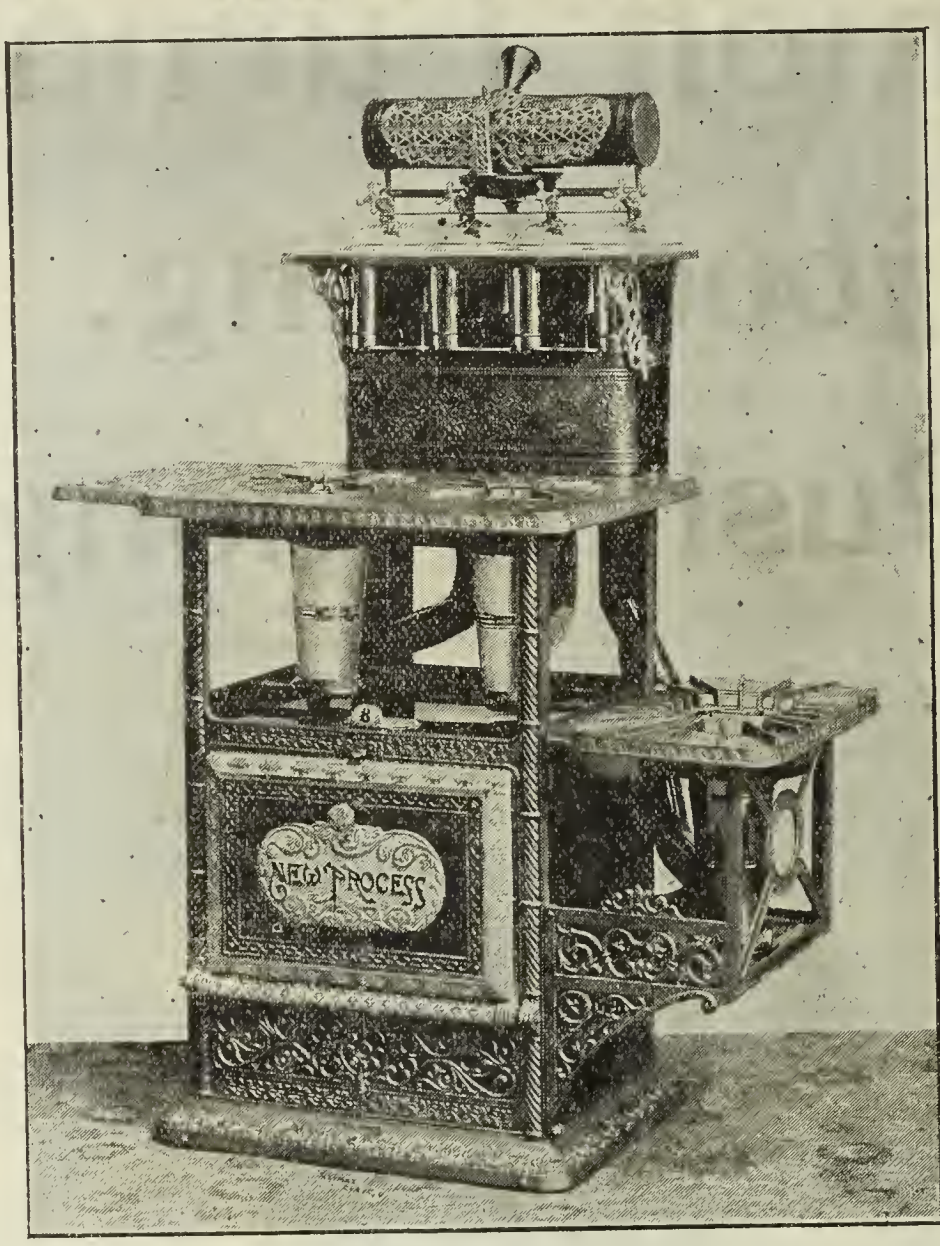


Made in six sizes, 28 to 51 inch Casings. With Steel Plate or Cast Iron Radiators.

Kernan Furnace Company,

CHICAGO, ILL. UTICA, N. Y.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

—MADE ONLY BY—

THE STANDARD LIGHTING CO.,
CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

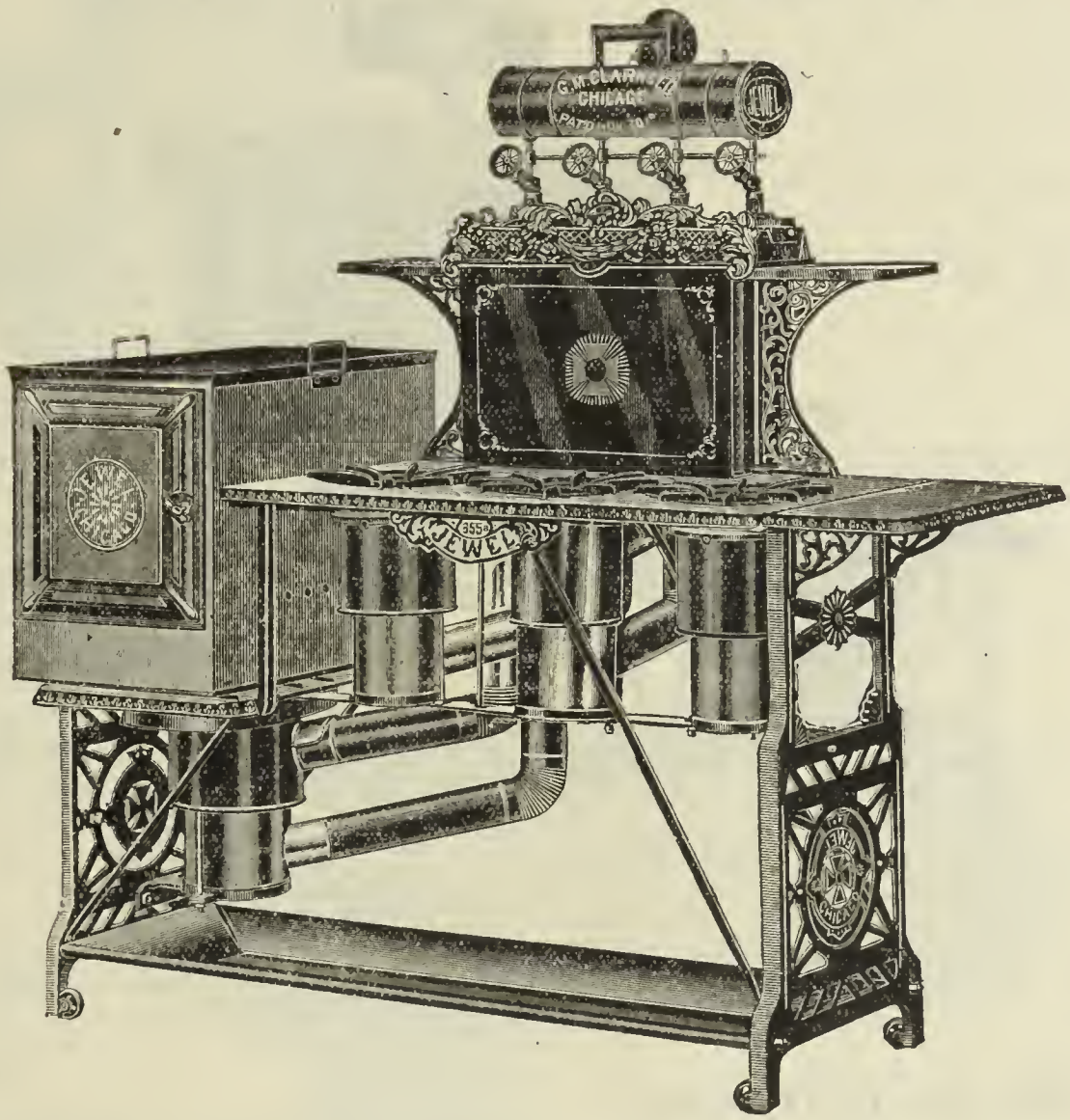
Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St, Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co, Terre Haute, Ind.
Milton Rogers & Sons, Omaha, Neb.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
H. Wetter Mfg. Co., Memphis, Tenn.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

WRITE FOR CATALOG.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

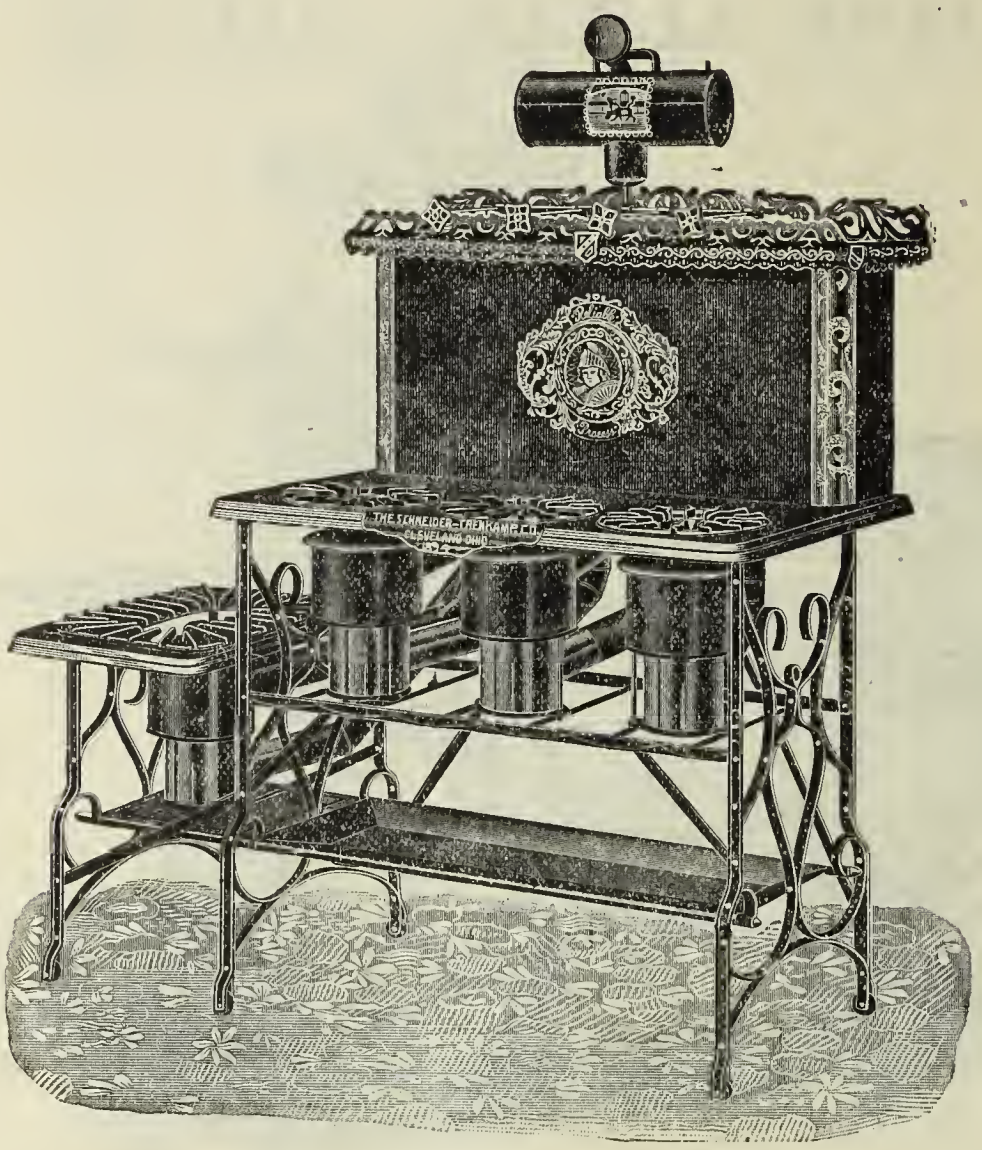
SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
BARSTOW STOVE CO., New York, N. Y.
W. W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

There are OTHERS,

But none that compare with the "Reliable."

SEE ? ? ?



This is not the only one,

Oh my, no. There ARE others,

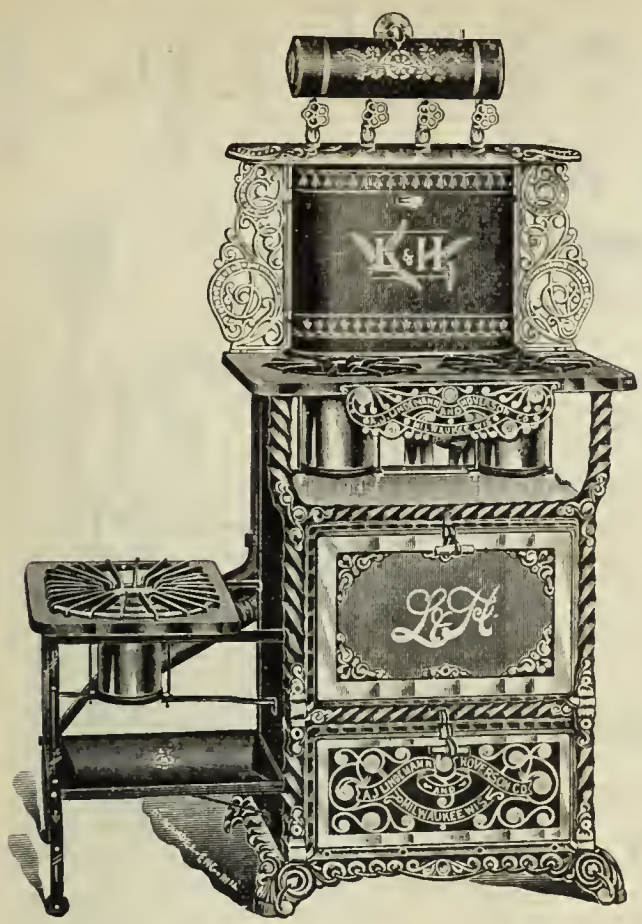
as illustrated in our 1895 Catalogue, which can be had by writing

THE SCHNEIDER & TRENKAMP CO.,

67 Lake Street, Chicago. Cleveland, O.

OR OUR AGENTS:

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F FOX Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans. La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.
S. FAITH & CO., Philadelphia, Pa.—Eastern Pennsylvania and New Jersey.
HUNNICUTT & BELLINGRATH, Atlanta, Ga., and Vicinity.



WE CLAIM the L. & H. Stoves are the Best. Here is our L. & H. cabinet. How do you like it? It has many friends. Made under the Kitson and Lindemann patents. It is the finest Range on the market.

Send for our new catalogue. It contains the largest assortment of Stoves, Ranges, Ovens, &c., for gas, gasoline and kerosene.

A. J. LINDEMANN & HOVERSON CO.,

Branch House, Chicago, Ill. MILWAUKEE, WIS.

P. S.—Notice this advertisement. It will show a new improved Stove every week.

AURORA PROCESS STOVES

Sales in 1894 Doubled.

"AURORA" IS KING.

Brass Cylinders; German Silver Points (Rust Proof); Removable Drip Valves; Sight Feeds; Ornamental High Shelf Brackets; Extra Extension Shelf on all Stoves.



Full line of Hot Generating Stoves and Ranges.

Also Junior Stoves, High and Low, all with Drop Tank.

Fine line of Gas Ranges and Hot Plates.

We defy all Competition on finish, operation and style of "Aurora" stoves.

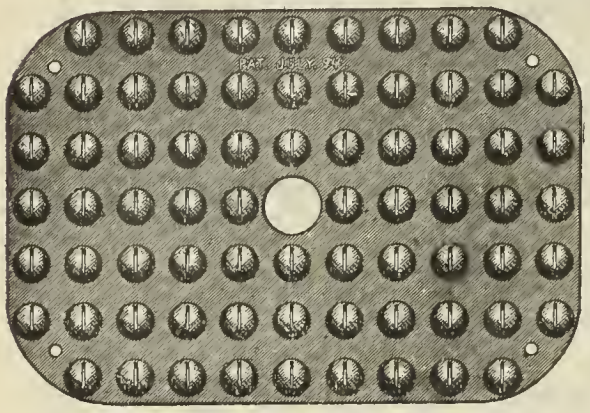
Send for 1895 Catalogue, now ready.

AURORA VAPOR STOVE CO., CLEVELAND, OHIO.

AGENTS:—THE PERRY STOVE CO., Albany, N. Y. H. W. PEAK, Fort Worth, Tex. JACOB RETTERER, Chicago, Ill. JAS. BEAKEY STOVE CO., St. Louis, Mo JANNEY, SEMPLE & CO., Minneapolis, Minn D. B. BAYLESS STOVE CO., Cincinnati, O. MAHOOD & Co., Philadelphia, Pa.

MICHIGAN VAPOR STOVE CO.,

GRAND RAPIDS, MICH.



No. 85 Burner, actual size 6 x 9 inches, 72 Jets of clear blue flame.

Ask for our 1895 Catalogue

and see what we have to offer. Our prices are right, and we can give the *Exclusive Sale.*



No. 86, 7-inch, 44 Jets Flame.
" 87, 5 " 21 " "

OUR JET CONE BURNERS distribute the heat evenly and for heating Flat Irons, Baking Griddle Cakes, or General Cooking, they have no equal.



No. 70 Single Generator Stove, on which we use the Jet Cone Burners, Nos. 85 and 86.

We also make a full line of

REGULAR

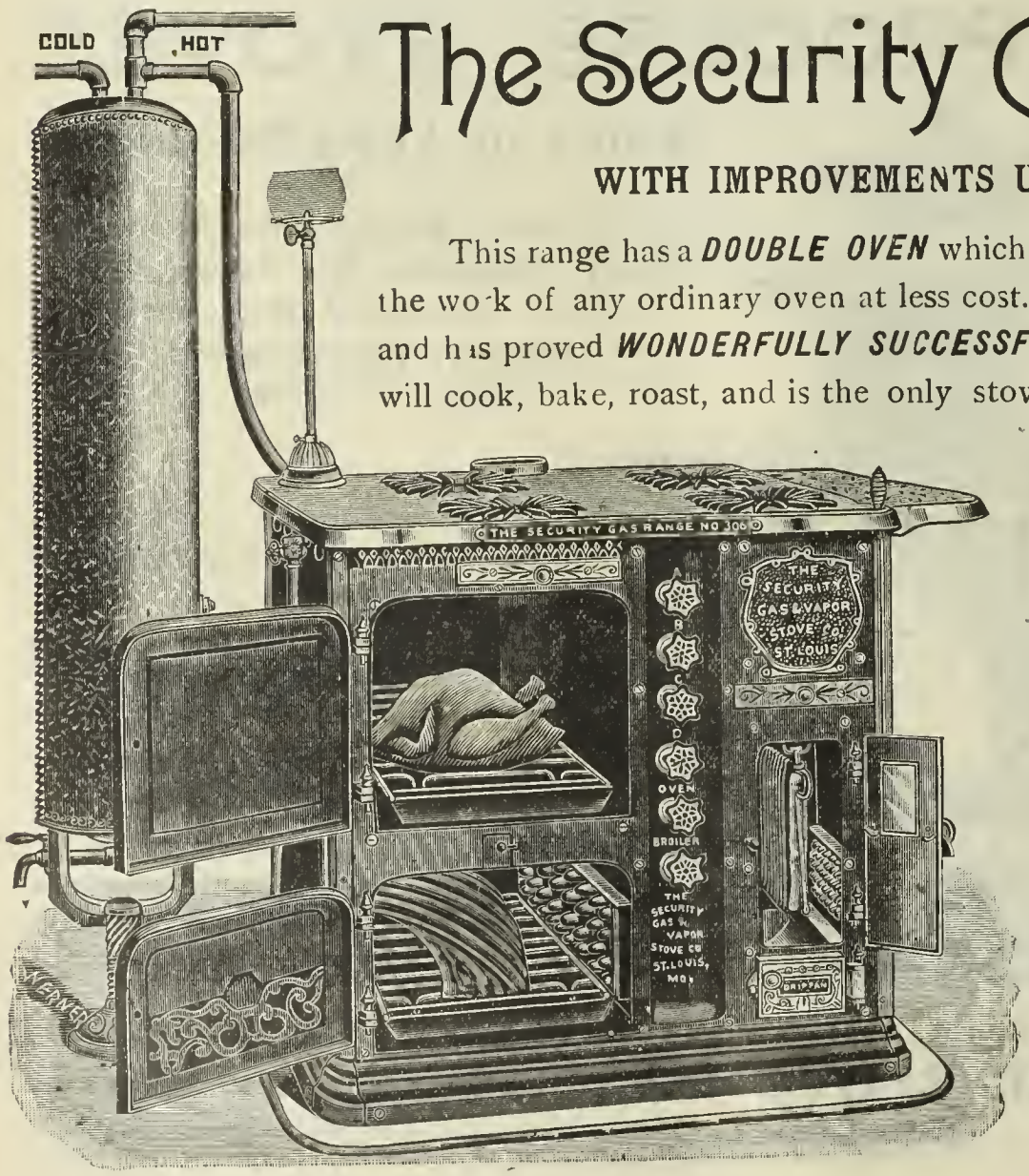
and

SPECIAL JUNIORS.

The Security Gas Range

WITH IMPROVEMENTS UP TO DATE.

This range has a ***DOUBLE OVEN*** which is guaranteed to ***DO DOUBLE*** the work of any ordinary oven at less cost. It is made for family use and has proved ***WONDERFULLY SUCCESSFUL*** wherever introduced. It will cook, bake, roast, and is the only stove which will ***BARBECUE A STEAK, AND WILL ALSO HEAT WATER QUICKER THAN ANY OTHER GAS STOVE ON THE MARKET.*** It is strongly built, neatly and tastily decorated and will prove ornamental as well as useful.



Write early and secure the Agency.

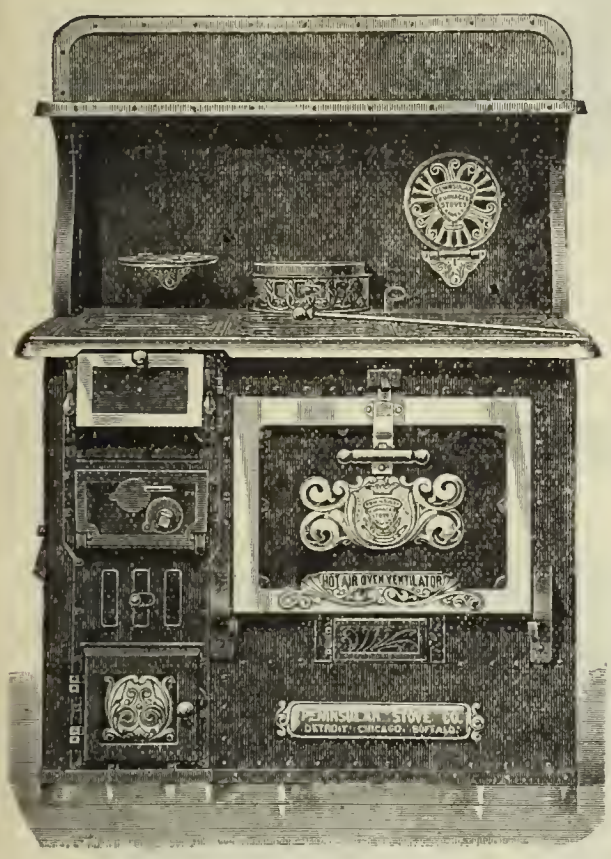
L. B. JONES,

ST. LOUIS, MO.,

Successor to

SECURITY GAS AND VAPOR STOVE CO.

PENINSULAR
WROUGHT STEEL
RANGES FOR 1895.



The only ranges from which Grate and Frame can be withdrawn without removing a single Plate or Bolt.

ANY STYLE OF TOP,

SIZE OF OVEN,

or COMBINATION DESIRED,

CAN BE SUPPLIED.

FOR

PRIVATE HOUSES,

HOTELS, RESTAURANTS,

OR PUBLIC INSTITUTIONS.

Write for Catalogue and Discounts.

A COMPLETE NEW LINE

—AND—

THE ONLY ONE

Constructed with a

COMBINATION POUCH AND SWING FEED,

Which makes a

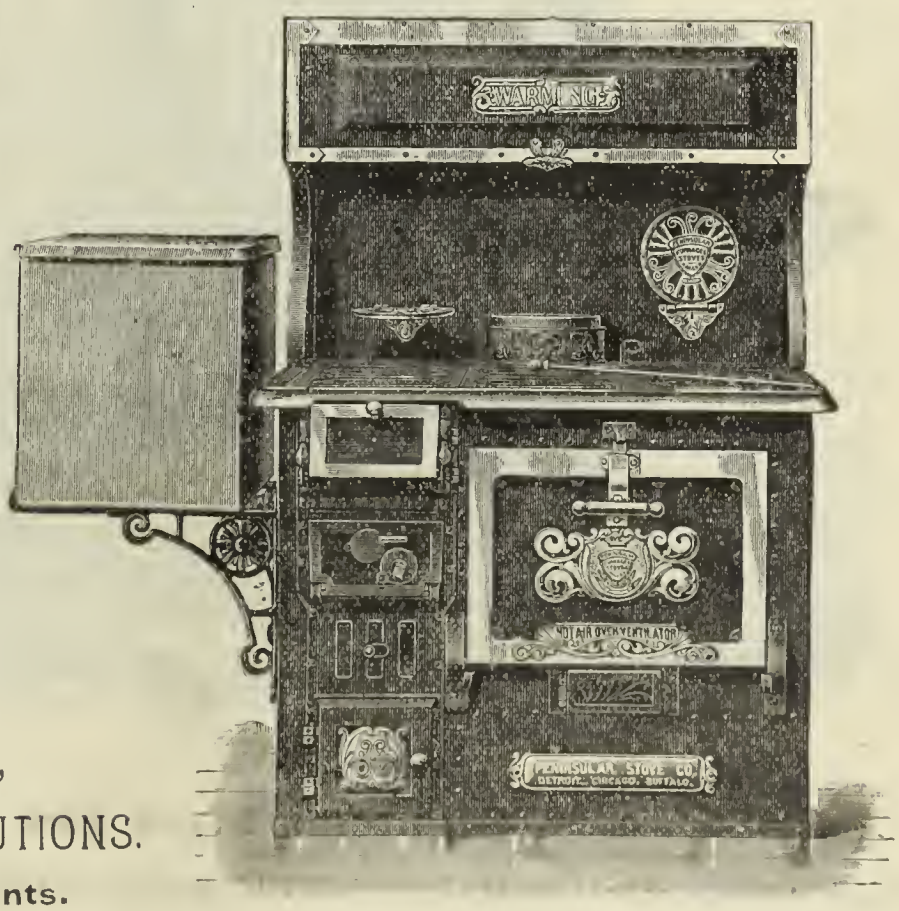
PERFECT AND PRACTICAL FIRE BOX

—FOR—

HARD COAL, SOFT COAL AND WOOD.

All Ranges are

ASBESTOS LINED.



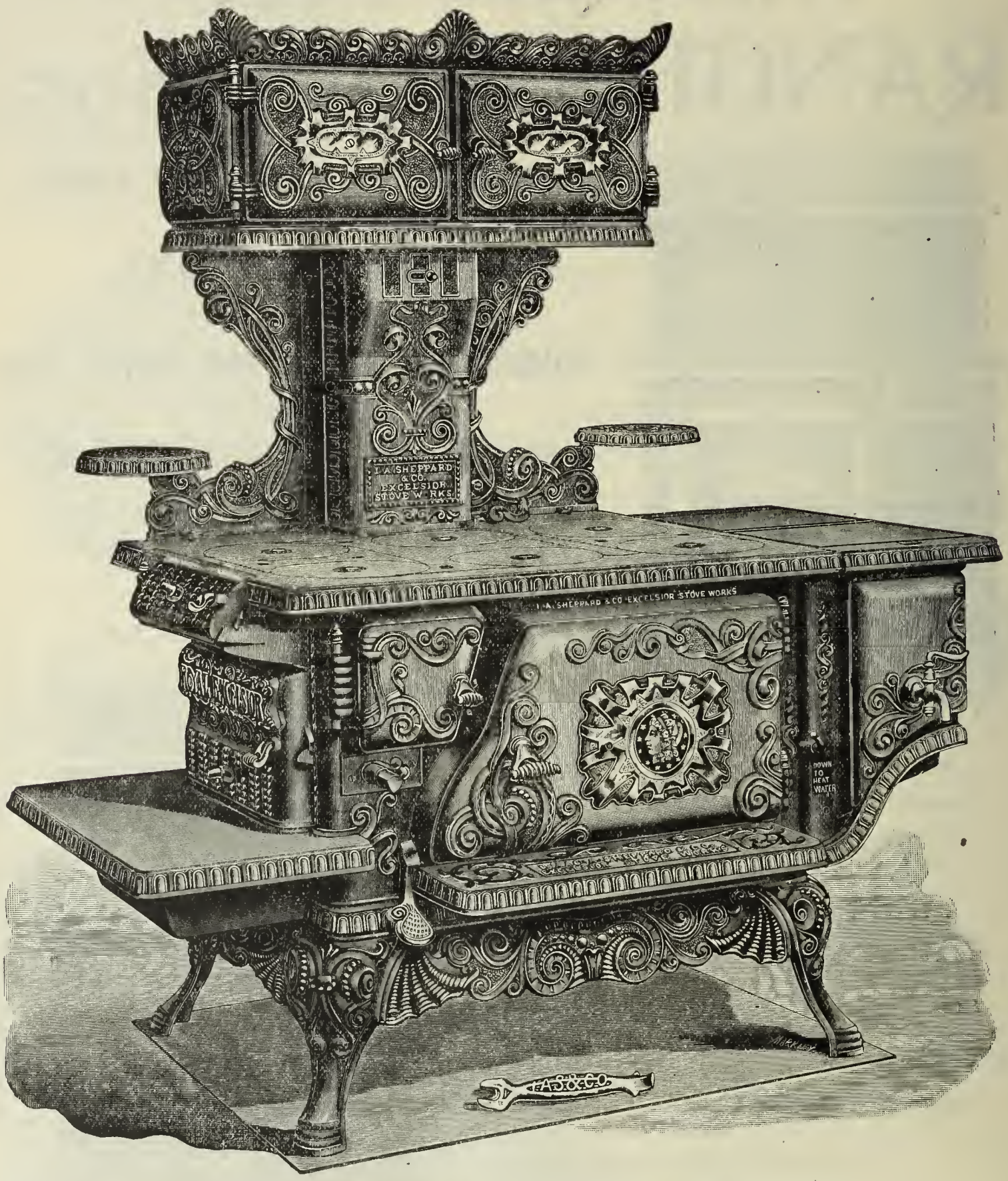
The Largest and Best Equipped Steel Range Manufacturers in the World.

THE PENINSULAR STOVE COMPANY,

DETROIT, CHICAGO, BUFFALO.

SOMETHING NEW AND STRIKING:

The Royal Excelsior Ranges!



Eighteen Sizes and Varieties.

(Cut shows Six-Hole Range With Reservoir, High Hot Closet and Cup Brackets.)

These goods will set your trade in motion this spring and keep it going indefinitely.

See Description on Opposite Page.

ISAAC A. SHEPPARD & CO., { PHILADELPHIA, PA. / BALTIMORE, MD.

MANUFACTURERS.

Admirable Trade Accelerators!

RANGES THAT SELL!

To sell goods now-a-days they must fairly bristle with good points. When Mrs. Noah moved out of the ark and set up housekeeping on Mount Ararat, she might have been satisfied to bale out hot water from an encased reservoir with a dipper (always spilling some on the stove top, of course), but modern housekeepers prefer to draw it off through a spigot, as those who use the **ROYAL EXCELSIOR RANGES** do. (This is our own patent. That is why you don't find other manufacturers using it.) Then there is also our "**ECLIPSE COVER,**" Three points: 1. Shape makes it strong—no place in it for a crack to start. 2. Cover lifted *at center of gravity,* the easiest possible way to lift a weight. 3. Cover lifted at once *from any position*—no pulling or pushing it around to bring lifter hole toward the operator.

Eclipse Cover.

Patented December 29, 189 .



Damper easily replaced through pipe collar, having no rods to warp or burn out. Large end Hearth, sliding forward. Deep, roomy Ash Pit, Bailed Ash Pan, &c. Fire Box fitted for Wood, or Hard Coal, or Soft Coal, as desired. Grates quickly removed without disturbing Fire Box Linings. Cross pieces so arranged as to bring four boiler holes directly into contact with the fire. Water Fronts for all sizes, with connections taken from the back to either right or left of range, so that circulating boiler may be used on either side. The Feet are independent of the Skirt Base, which bolts to the feet after the Range is set up, thereby enabling one man to put the entire apparatus in place. The design is the work of a superior artist. All edges are beautifully ornamented, and will look well as long as the range lasts (Ground edges are hard to keep from rusting while goods are in stock, and turn blue and lose their good looks at the first fire. The ornamented edge is one of the greatest improvements of modern stove making.)

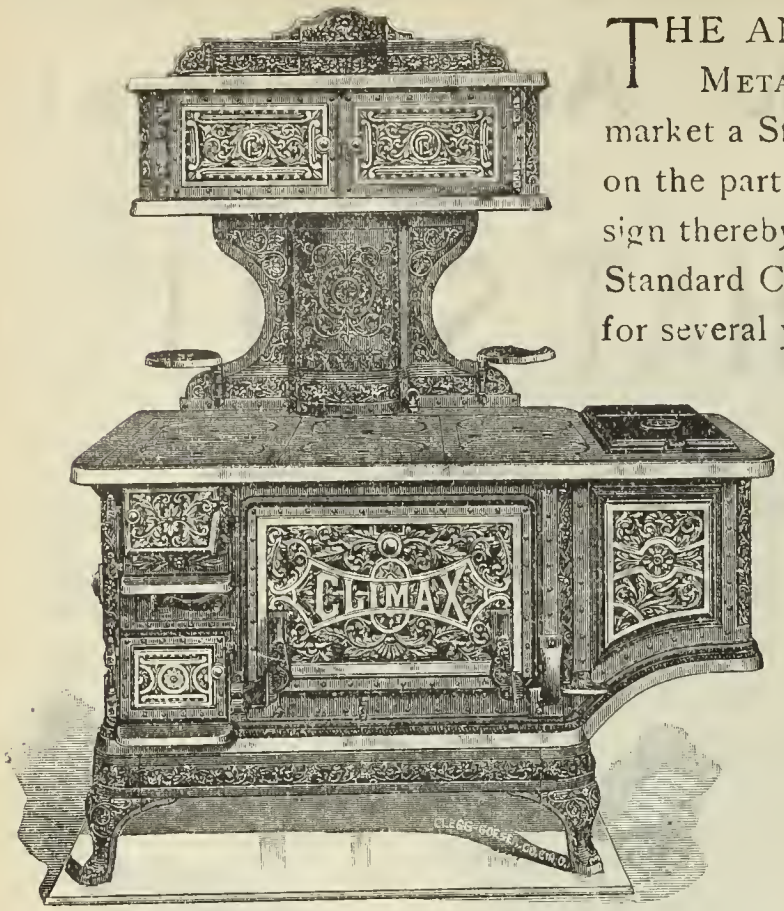
The mounting and fitting are of the best, and the added features of Nickeled "Alaska" Knobs, Nickel Name Plate, Nickel Oven Door Panel with Tile Center, Nickel Hinge Pins and Nickel Oven Door Pedal enhance the attractiveness of the goods

We cannot tell you all about these goods in a moment. Send to us for a descriptive and fully illustrated catalogue-circular. They are made with either four holes or six holes on top and with or without Reservoir.

If you buy one of these ranges, blacken it nicely and put it in a conspicuous place on your store floor, and within 30 days you are not satisfied with it, you may send it back at our expense. (If you keep it over 30 days, of course it's a sale.) Does this proposition strike you as fair?

ISAAC A. SHEPPARD & CO.,

Philadelphia and Baltimore.

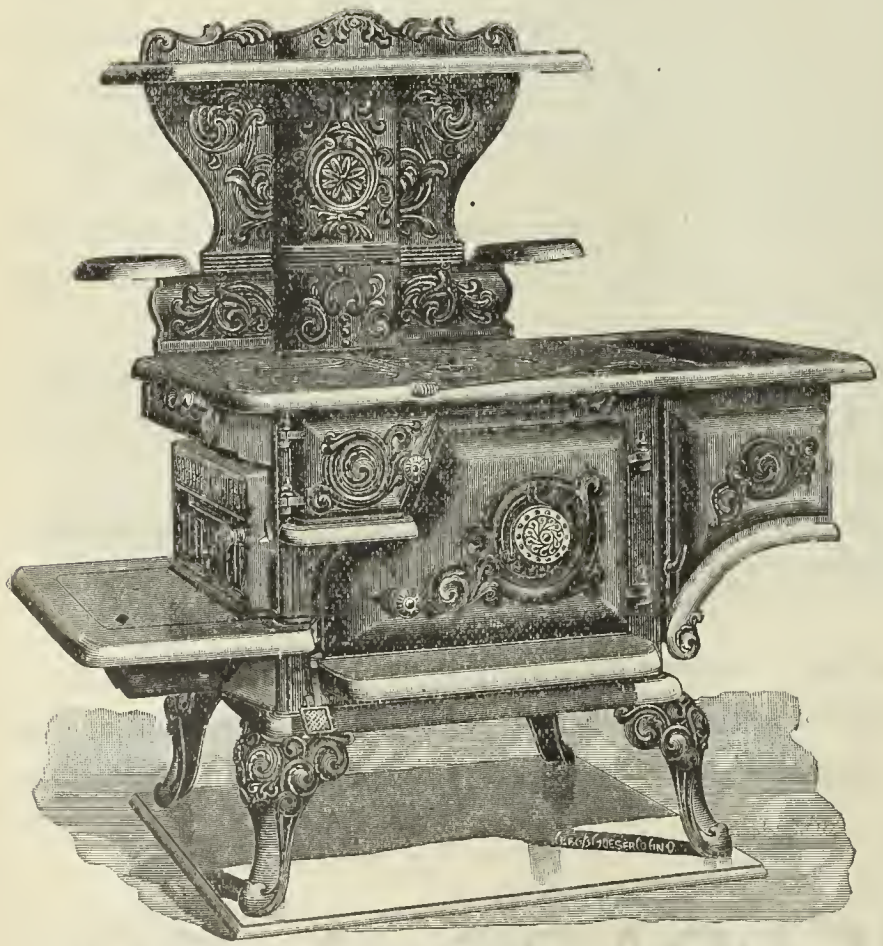


THE ANNOUNCEMENT in a recent issue of THE METAL WORKER that we are soon to place on the market a Steel Climax Range having prompted the inquiry on the part of some of our patrons as to whether we design thereby to abandon the manufacture of our Celebrated Standard Climax Range, which has maintained supremacy for several years as an established leader of its class and against which not a single complaint has been filed in our office, we desire by this to inform the trade that the reputation of the Climax Range and constantly increasing demands for same is such as to preclude the possibility of abandonment if we felt disposed to do so. The Range, we are pleased to say, is more popular than ever, and the manufacture of same will be continued in all its varied conventional styles and sizes, and we sincerely trust that none will be deceived into a belief that an ***imitation*** now being offered to the trade is as good as the initial construction, which can only be procured of

TAPLIN, RICE & CO., AKRON, OHIO.

Southern Queen

for Coal, with Flush Reservoir and High Shelf—a



PECULIARLY PRACTICAL, PERFECT PRODUCTION

Of the Stove Makers' Art. All the advantages of a High-Priced Range at the cost of a low-priced Cook Stove. Made in the best possible manner, of the best material, and is a stove to catch Customers with every time. Write for Catalogue and Prices.

The Portsmouth Stove & Range Company,

Portsmouth, Ohio.

AGENTS:

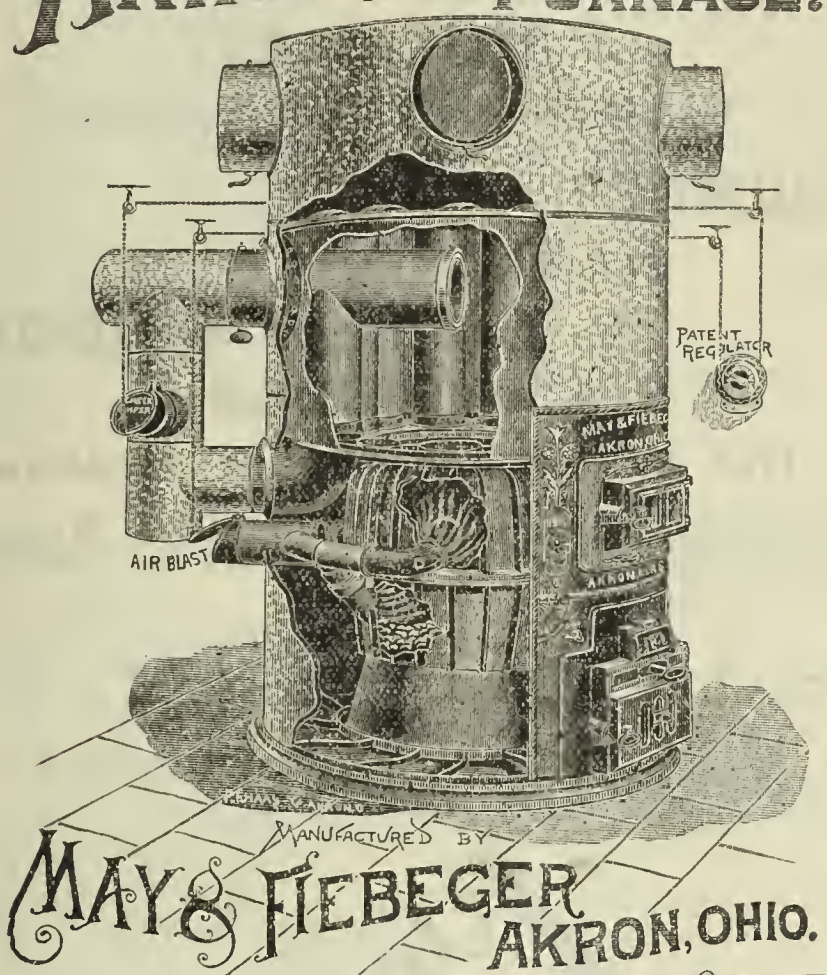
R. ROBINSON & SONS, Chicago, for the Northwest.
A. L. CANFIELD, 284 Pearl Street, New York, for New England States.
C. F. HAKE & SONS, for Cincinnati and Vicinity.
HOME STOVE CO., Indianapolis, Ind.
W. E. ANTHONY & CO., Detroit, Mich.; Mich. and Minn.
BRADLEY, MUNK & CO., Columbus, Ohio.

---

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.

"JUST AS GOOD AS THE AKRON 'AIR BLAST' FURNACE,"

AKRON AIR BLAST FURNACE.



MAY & FIEBEGER AKRON, OHIO.

Has become a familiar expression with the stove trade in many States.

Don't **you** want to make your competitors use it? Why it is so commonly used, is a Think to thought about.

WE ARE IN IT.

The past extremely cold weather has clearly demonstrated that.

THE ORIGINAL AKRON AIR BLAST FURNACE and its many agents are strictly in the swim. There is no weather too cold for us.

After twenty-five years' experience with the best furnaces made our Mr. May was convinced by careful experimenting and studying that they were not built on scientific principles, and therefore he invented and six years ago perfected the "Air Blast" principle for burning coal, which he has applied to the Akron Air Blast Furnace, and it has been so successful in burning all kinds of fuel, especially soft coal, that it has completely revolutionized the furnace business, and all manufacturers of the best furnaces are now trying to imitate it. The Akron Air Blast Furnace is the original and leader. Others follow.

THOUSANDS of users are glad to testify to its merits and its economy.

HUNDREDS of dealers are happy with its success.

DOZENS of imitators are wondering how it took its place at the front in so short a space of time.

ONE special dealer we are desirous of informing as to why the Akron Air Blast Furnace has such a wonderful record. You we mean. Write us.

Build up your trade with a certainty. No need of making furnace work a hit and miss.

Can you equal the following record with the furnace you are selling?

We have hundreds of agents in Ohio, Indiana, Illinois, Iowa and other States whose experience is equal to this. Carload and duplicate orders from them prove that their trade is increasing.

76 Furnaces Sold

AND NOT ONE COMPLAINT.

THE

Akron "Air Blast" Furnace

Has proven a Record Breaker. Even in hard times our agents have been busy. You should secure agency at once and be in the race at the front.

READ THE FOLLOWING LETTER:

OFFICE OF
WELCH & HORTON,

NEW CASTLE, Pa., March 23, 1891.

Messrs. May & Fiebeger, Akron, Ohio.

GENTLEMEN: We took the agency of the Akron Air Blast Furnace late in the season of 1891, and have sold up to the present time 76 Furnaces, and have not had a complaint from a single furnace, which we consider is the best recommendation the furnace can have. Our furnace trade has been affected less by the hard times than any other line of goods we handle, which shows that people always find the means with which to buy a good article.

The Akron Air Blast Furnace has established a reputation for itself through Lawrence County that other furnaces cannot overcome, and when they make a sale it is to parties who look at price and not the furnace. We know that we have the best furnace on the market to-day and our customers know it, too. Wishing you success for 1891, we remain, Yours respectfully

WELCH & HORTON.

Welch & Horton's Sales Have Been:

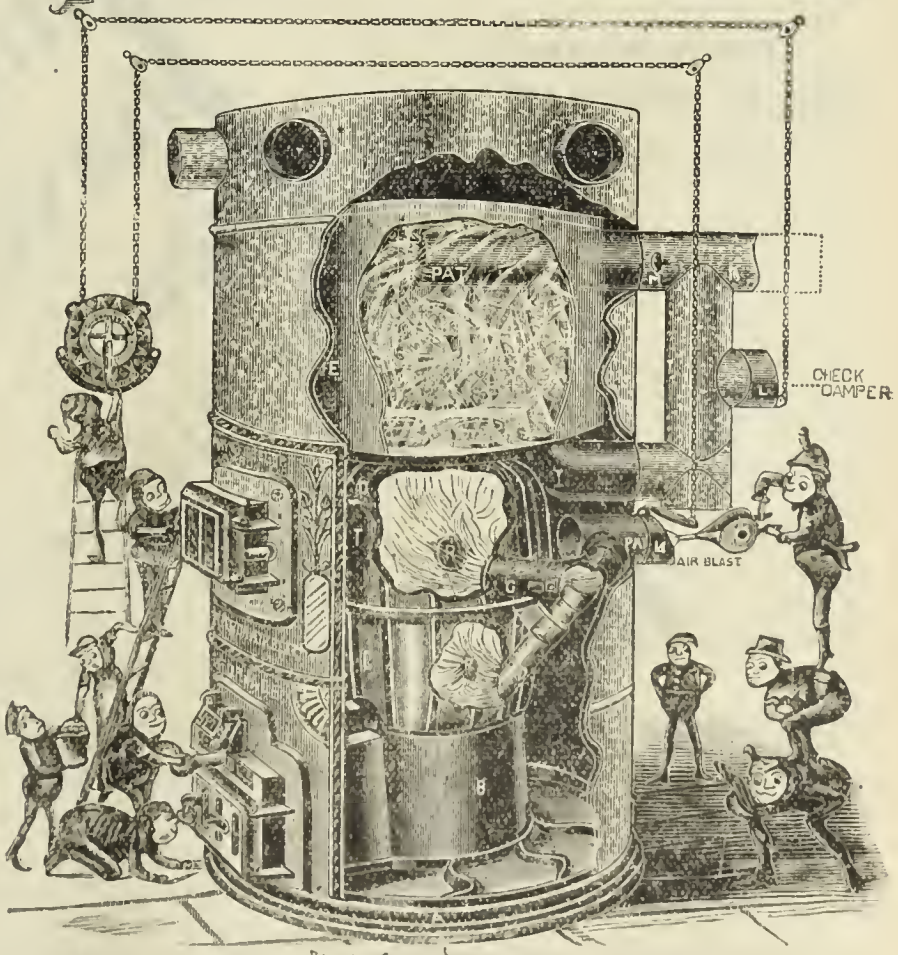
8	Akron Air Blast Furnaces	in	1891	
30	" " "		1892	
38	" " "		1893	
34	" " "		1894	M. & F

Write for Catalogue Secure the Agency before some live competitor of yours gets it.

MAY & FIEBEGER, Mfrs.,

Akron, Ohio.

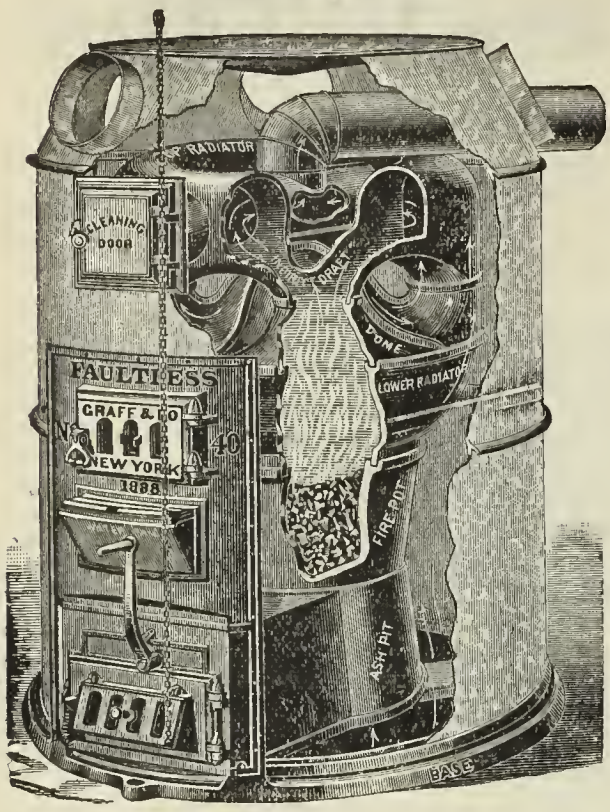
AKRON AIR BLAST FURNACE.



MANUFACTURED BY

MAY & FIEBEGER AKRON, OHIO.

FAULTLESS.



SUPERIOR GOODS.

FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.
HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.

Faultless, Elegant and Columbian Ranges.

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.

The Craig-Reynolds F'd'y Co.,

DAYTON, OHIO.

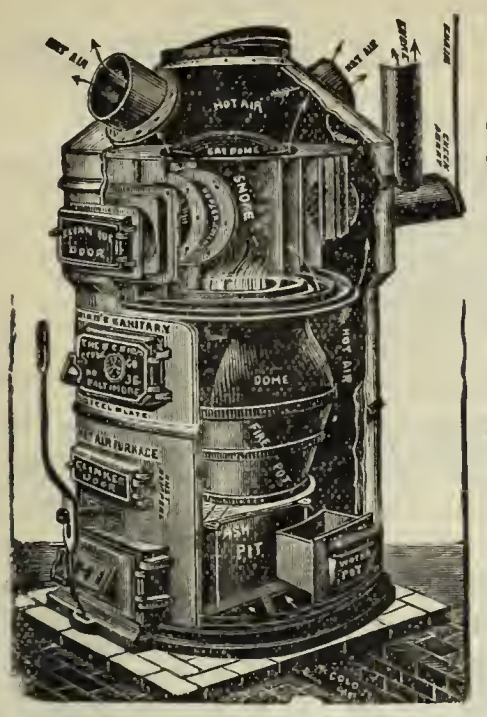
WESTERN BRANCH:
GEO. D. HOFFMAN, Mgr.,
82 Lake St., Chicago, Ill.

Because Oppor=tunities may have been neglec=ted in the past,

Is no reason why they should be at the present time. If you are contemplating or figuring on heating installation during the approaching building season, we would suggest you investigate our line of six styles and 30 sizes of Furnaces and obtain our price. It will be money in your pocket.

WRITE US FOR
The 1895 Catalogue of the Triumph Heaters,
OR
The Principles of Heating and Ventilation,
with Facts and Figures,
OR
The Picture Book,
OR
The Triumph Estimate Book,
all published for the use of the trade.

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY
HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

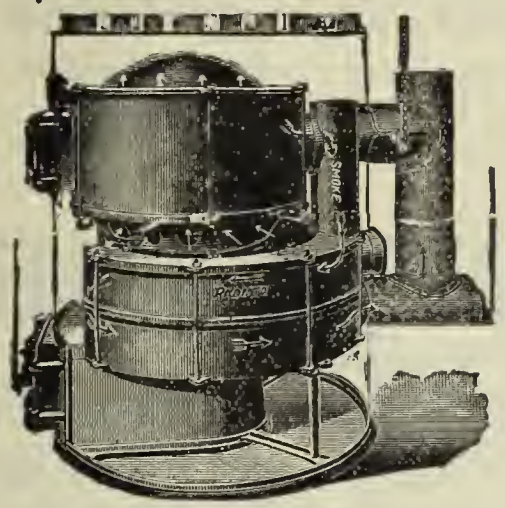
BIBB'S ORIGINAL

Baltimore Fire Place Heaters

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

IT IS A GREAT ECONOMIZER OF FUEL.

IT IS A LOW FURNACE.

CORNING, N. Y., January 16, 1895.
Gentlemen: The No. 40 Victor you set in '91, and the No 45 Victor set in '92 are doing good work, with an economical use of coal, and this month the Thermometer has shown on several days a record from 7 to 22 degrees below zero.

Respectfully yours,
J. P. YOUNG.

Agents wanted. Address

THE CORNING MANUFACTURING CO.,
Corning, N. Y.

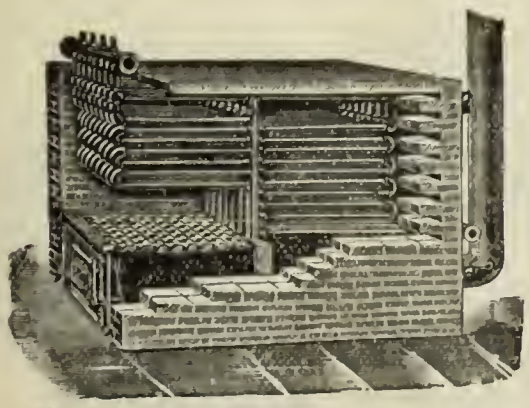
DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers
Are the Best
—FOR—
Steam or Hot Water Heating.
—o—
Send for Catalogue.



The Dunning Boilers
ARE MADE OF
Wrought Iron or Steel
AND HAVE NO
Packed Joints.



The Electric Boiler
—FOR—
Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN
Over 300 Different Sizes.
SEND FOR CATALOGUE TO

The Electric Boiler Co.,
23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST.,
ROCHESTER, N. Y.
New York Office, 44 Dey Street.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF
Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth, Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,
96-102 Reade Street, NEW YORK.

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

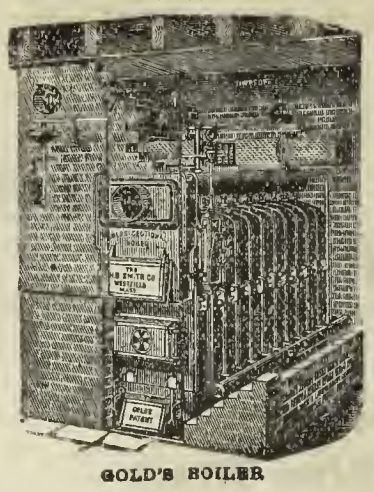
407 pages, 7 x 9⅛ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



GOLD'S BOILER

THE H. B. SMITH CO.,

MANUFACTURERS OF

Steam and Water

Heating Apparatus

FOR

PUBLIC BUILDINGS AND PRIVATE RESIDENCES

SPECIALTIES:

Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
Reed's Improved Cast-Iron Radiators,
Gold's Indirect Pin Radiators,
Breckenridge's Patent Automatic Air Valves.
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for hard or soft coal.

Office & Warerooms, 137 Centre Street, New York.

FOUNDRY, WESTFIELD, MASS.

Catalogues Sent on Application.

STEAM HOT WATER WARM AIR

FOR HEATING ALL CLASSES OF BUILDINGS

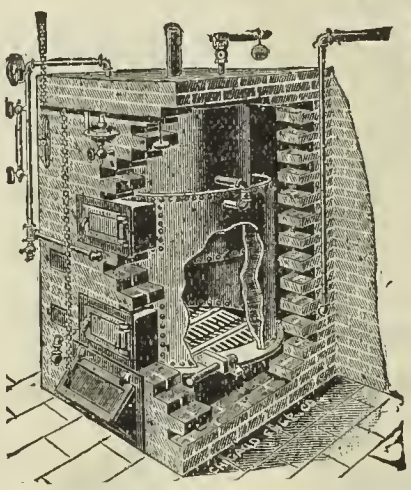
CAPITOL HEATERS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use **HARD or SOFT COAL.**

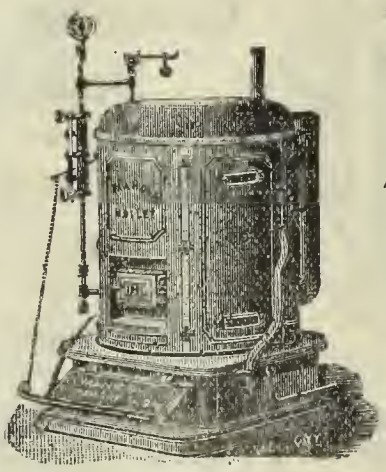
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



THE MAHONY BOILERS.

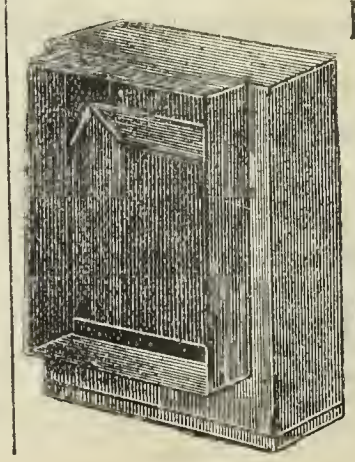
For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



Novelty Ventilated Wall Pipe,

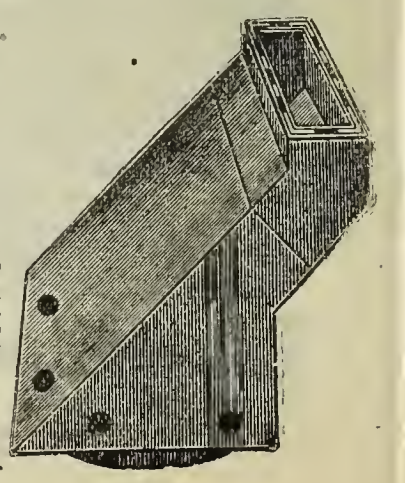
Absolutely Fire Proof.

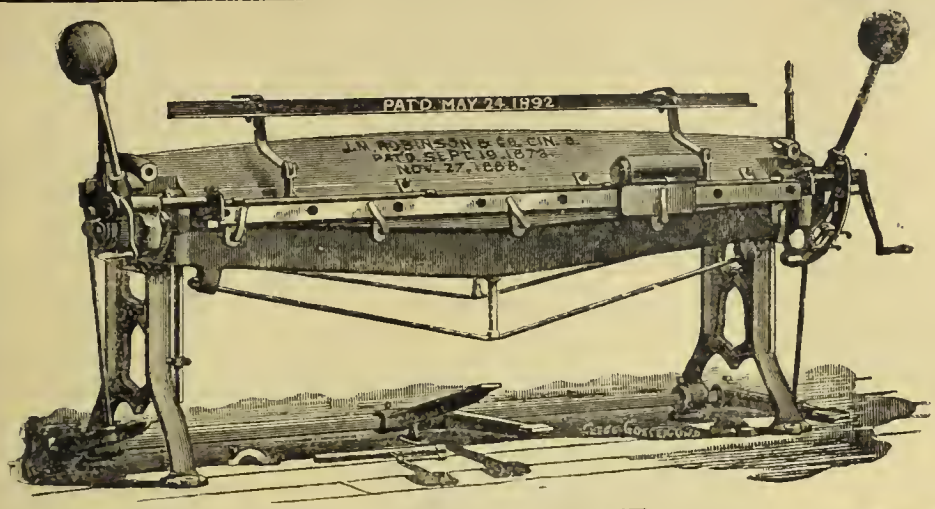
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 3 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER

18 Wood Street, Pittsburgh, Pa.



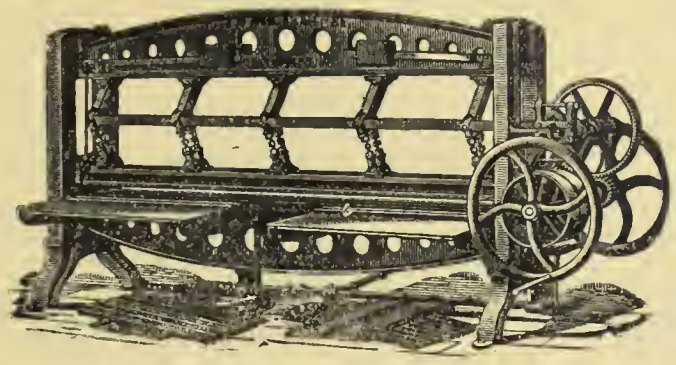


THE "GLOBE" CORNICE BRAKE.

With which to form Sheet Metal into Cornice Mouldings, Ridge Caps, Skylight Bars; and with Beader and Gutter Former attached to Brake (price of which is extra), Bead and Form Gutters. Cornice manufacturers' Steel Straight Edges, 30 inch to 10 foot lengths.

ROOFING MACHINE.

With Dies suitable, will form Sheet Metal Roofing, Siding, Ceiling, Weather-Boarding, Skylight Bars, Metal Lathing, Gutters, Ridge Caps, Escalloped Steel Sheets and Cattle Troughs.



J. M. Robinson & Co., Mfrs.,

225-229 W. Second St., Cincinnati, Ohio, U. S. A.



All set up ready to use. Price, $30.00. Freight allowed to points as far West as Missouri River, and as far South as Galveston, Tex.

FOR SALE BY

Hall & Carpenter. Philadelphia, Pa.
Austin & Dolen, Boston, Mass.
Hackett Hdw. Co, St. Paul, Minn
and jobbers generally.

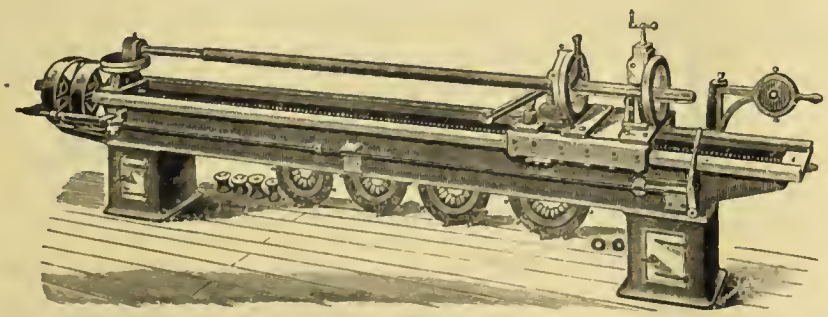
If your jobber can't supply you, order direct of the manufacturers.

SEND FOR CATALOGUE.

Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

JACOB BROMBACHER'S SONS - No. 30 Cliff St., N. Y City.
Established 1833. Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - **Canton, Ohio.**

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade Street, New York.

KEEP YOUR EYE



ON THIS SPACE.

From time to time we intend posting you on the merits of our goods, new productions, &c. Remember that for over 56 years our *celebrated "Bay State" Furnaces, Ranges and Stoves* have been sold extensively on their merits. *Do not forget* that the *"Bay State" Line* is the one to push and stand by. *Do not complete* your arrangements until you have *thoroughly investigated* our *manufactures. An inspection of our salesrooms and correspondence is solicited.*



Barstow Stove Co.,

NEW YORK, 228 Water St.

BOSTON, 56 Union St.

Foundries at Providence, R. I.

Look Out

For Acid Flux

In the seams of **CONTINUOUS ROOFING TIN.** We have found it in all that we have tested of *makes other than our own.*

Acid is the greatest enemy of Roofing Tin, because it eats through the iron.

There is a very simple but reliable plan for detecting the presence of acid which we will furnish upon application.

The seams in *OUR* **CONTINUOUS ROOFING TIN** are absolutely free from acid, because there is none used.

N. & G. TAYLOR CO.,

PHILADELPHIA.

Originated and Introduced

CONTINUOUS ROOFING TIN 26 YEARS AGO.

Established 1810.
86th Year.



ESTAB. 1857.

The Great CHURCH LIGHT. Frink's Patent Reflectors for Gas, Oil or Electric, give the most powerful, softest, cheapest and best light known for Churches, Stores, Banks, Theatres, Depots, &c. New and elegant designs. Send size of room. Get circular and estimate. A liberal discount to churches and the trade. *Don't be deceived by cheap imitations.* **I. P. FRINK,** 551 Pearl St., N. Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

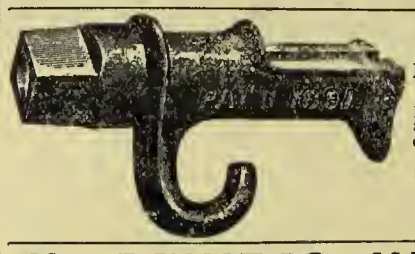
Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK

TINNERS' TOOLS and MACHINES

TINNERS' SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOO

By far the best Spout made. Greatly i proved this season. More used every year th all others combined. Sold by leading jobbe everywhere, and to them by

CHARLES MILLAR & SON, Utica, N.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY



TRADE MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON

PATENTED :

Decemher 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. Al WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh, Pa.

HAMILTON'S

BEST REDIPPED AMERICAN ROOFING TIN

is DIPPED AND REDIPPED by HAND, and is NOT coated b machines through ROLLS like some plates that are laude so highly by the makers. and the coating on Hamilton' Best Redipped is as heavy on the TOP half of the sheet a it is on the BOTTOM half. You have scales, test it. We ca furnish machine coated plates with 20 lbs. of coating t the box of I. C. 20 x 28 at $11.50 per box, fully equal t any of the so-called extra coated plates.

JOHN HAMILTON,

PITTSBURGH, PA.

McCLURE'S REDIPPED

ROOFING TIN.

AMERICAN MADE.

The durability of a Roofing Plate is in the amount and quality of Coating and not in the iron.

McCLURE'S REDIPPED

Is the finest and heaviest coated Roofing Plate made; guaranteed to contain **35 lbs. Coating** per 112 sheets.

To reduce the price of a Roofing Plate is simply to reduce the quality and amount of coating, thereby making a much inferior plate.

The high quality of **McClure's Redipped** will always he maintained as it is our desire to make the **finest and heaviest coated** Roofing Plate in the market regardless of any cost.

The best is always the cheapest.

McCLURE & CO., Pittsburgh, Pa.

Index to Reading Matter, Page 62.

Index to Advertisements, Pages 95 - 97.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

L. XLIII. MBER 11.

NEW YORK AND CHICAGO, MARCH 16, 1895.

ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

AMERICAN RADIATORS

HONESTLY CONSTRUCTED.
POSITIVE CIRCULATION.
ARTISTIC, SIMPLE, DURABLE.

Endless variety of styles.
Largest makers in the world.

AMERICAN RADIATOR COMPANY



NATIONAL.

NEW YORK. BOSTON. PHILADELPHIA. ST. LOUIS. MINNEAPOLIS. DENVER. LONDON, ENG.

111-113 Lake St., CHICAGO, ILL.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.
197-203 Congress St., Boston. Old Colony Bldg. Van Buren and Dearborn Sts., Chicago.

F&W Co.

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.
FULLER & WARREN CO. TROY, N.Y.

HOT AIR PARAGON FURNACES

ISAAC A. SHEPPARD & CO.
MANUFACTURERS
PHILADELPHIA, PA.
AND
BALTIMORE, MD.

SIX POINTS

1. FEWEST JOINTS. 2. EQUALIZED DRAFT
3. LARGEST RADIATING SURFACE
4. ABSOLUTELY SELF CLEANING
5. BALL BEARING GRATE
6. PERFECT ADAPTABILITY TO ANY KIND OF FUEL.

OUR FURNACE BOOK "HINTS ABOUT HEATING" MAILED FREE IT WILL INTEREST YOU: IT MAY HELP YOU

The Apollo

on is flat and soft enough to bear usual bending. ot sometimes; not generally; it is so nearly all ke that we warrant it all alike.

To warrant it so does not make it so. If a sheet ckles or breaks we can take it back and send you other that don't; or any number of sheets. This is iat we mean by guaranteeing Apollo Galvanized on.

Apollo Best Bloom is the trade mark.

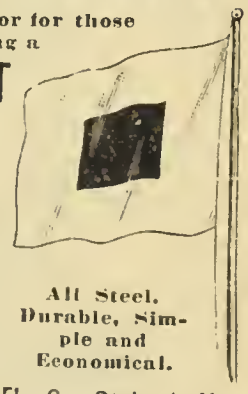
APOLLO IRON AND STEEL COMPANY
Pittsburgh Pennsylvania
WORKS AT APOLLO

te for new telegraphic code.

HIGHLAND RANGES, HEATERS and STOVES
HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.
"Kitchen Boiler Connections."
A Selection of Practical Letters and Articles
—RELATING TO—
Water Backs and Range Boilers.
Compiled from *The Metal Worker*.
71 Illustrations.
A Practical Helper. Price, $1.00.
DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG
Has no terror for those using a
FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.

All Steel. Durable, Simple and Economical.

Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.
EXETER MACHINE WORKS, BOSTON, MASS Works, EXETER, N. H.

GULATORS

or all purposes where any kind Automatic Regulation of Air, ater or steam is required.

MASON REGULATOR CO.,
Boston, Mass.

JENKINS' STANDARD PACKING.



We manufacture Packing and then ask Engineers and users to buy it on the strength that it will do more and better work than any packing made. Our standing guarantee that it will do all that any Packing will do, and that it has other advantages that no other Packing has, is a good reason why every one interested should insist on having the genuine. TRADE-MARK LIKE CUT STAMPED ON EVERY YARD.

JENKINS BROS., New York, Chicago, Philadelphia, Boston.

KIELEY'S - STEAM - SPECIALTIES.

Pump Governor, Return Steam and Drain Traps, Steam and Water Reducing Valves, Noiseless Back Pressure Valves, Water Arches and Oil Separators.

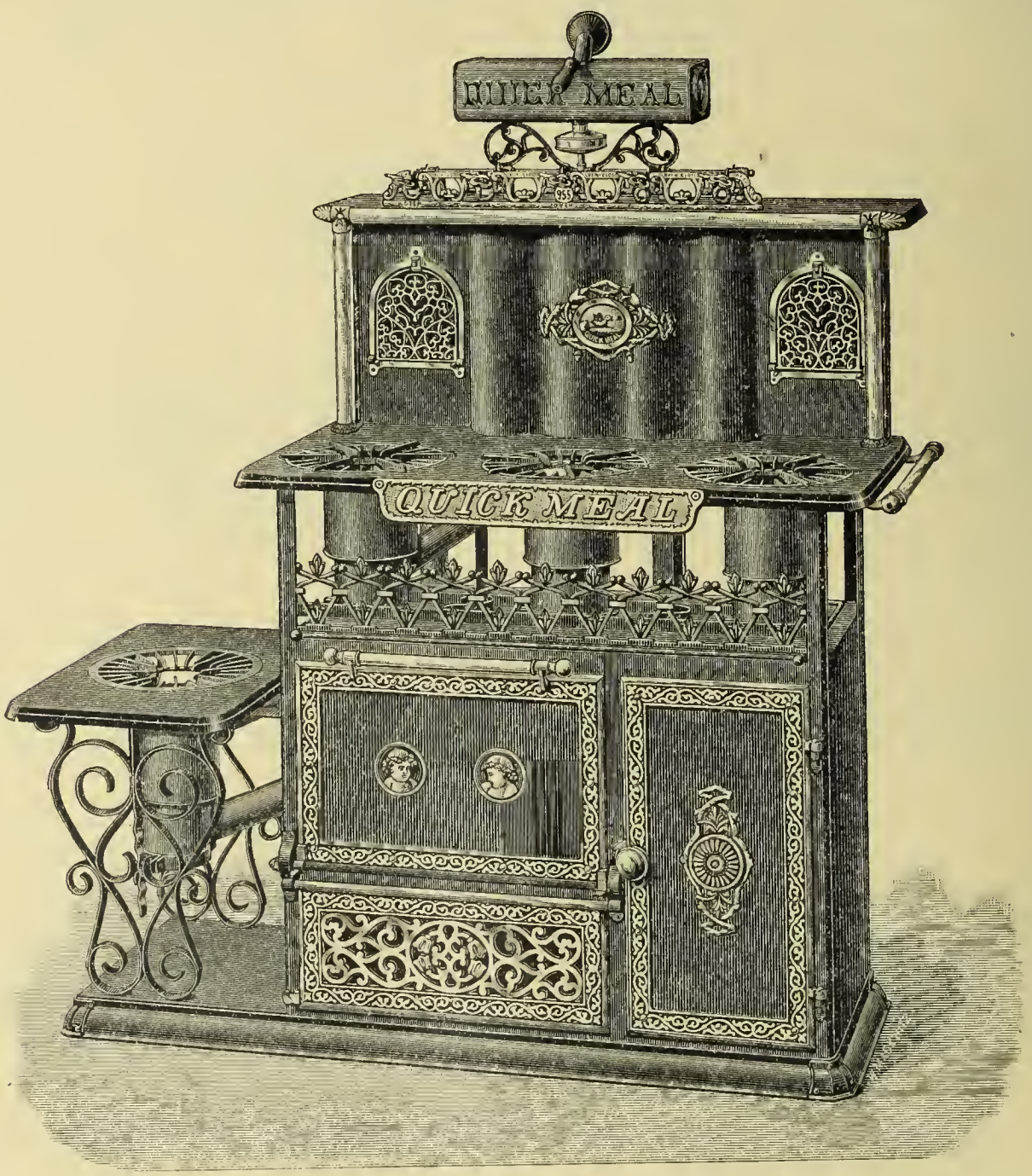
T. KIELEY, 7-17 W. 13th St., NEW YORK.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

ST. LOUIS.

Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

Hot Water & Steam Boilers & Furnaces.

SOLD ON THEIR MERITS FOR 47 YEARS.



Carton's Low Gas Tight Furnace, Vertical Flues. All Cast Iron.

All our Heaters
are Guaranteed.

The Largest Variety
of Styles and Sizes.

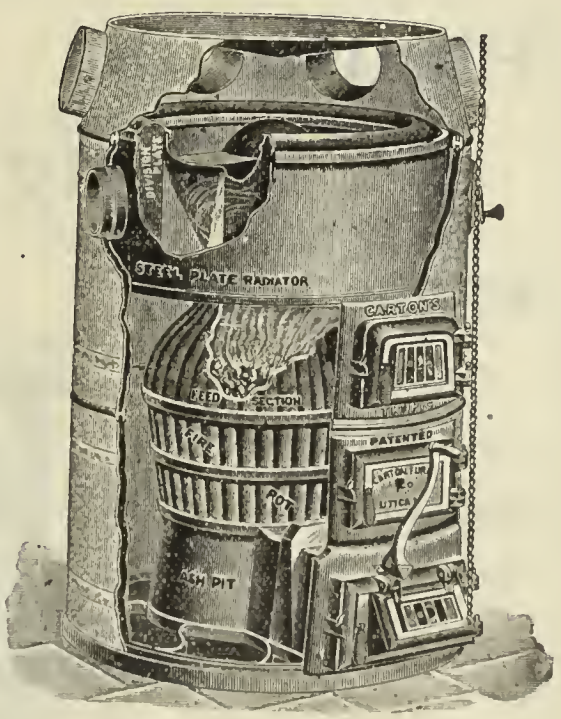
They are easily Sold.
Many Thousands in Use.

EVERY Furnace Dealer ALIVE TO HIS INTERESTS should have Our Catalogue and Discounts.

They build up a reputation for the dealers who sell them, because they always give satisfaction.

The original "Smyth" Triangular Revolving Anti-Clinker Grates used in all our Heaters. Perfect in Operation.

Our **Prices** and *Catalogue* will *surely* **interest you** and it *costs* you *nothing* to procure them. Drop us a *postal card* and **be convinced.**



Carton's Tropic, with Steel Plate or Cast Iron Radiator.

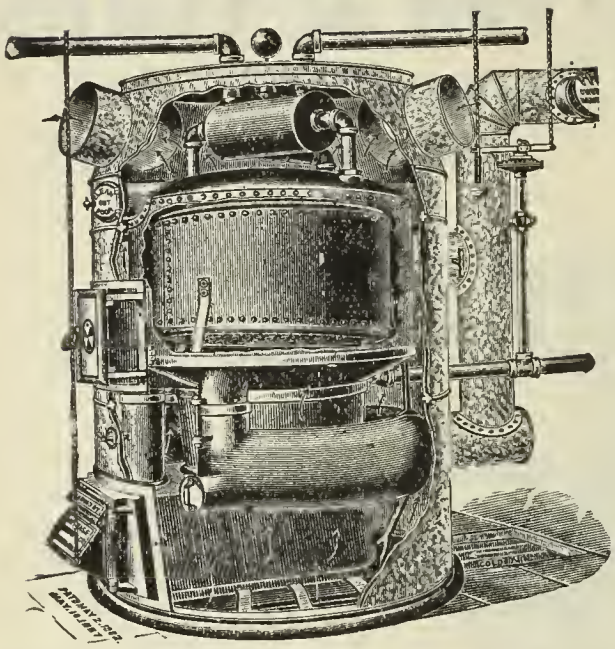
MANUFACTURED BY

CARTON FURNACE CO., UTICA, N. Y.

Makers of Heating Apparatus for the past 47 Years.

Write for our Catalogue and Discounts and secure the Agency. Also write for our Price-List on Superior Line of Furnace and Pipe Fittings.

ECONOMY HEATERS AND FURNACES



20 PATTERNS OF APPARATUS.

Combination Steam and Air.
Combination Water and Air.
Steam, Straight.
Hot Water, Straight.

Warm Air Furnaces.

J. F. Pease Furnace Co.,

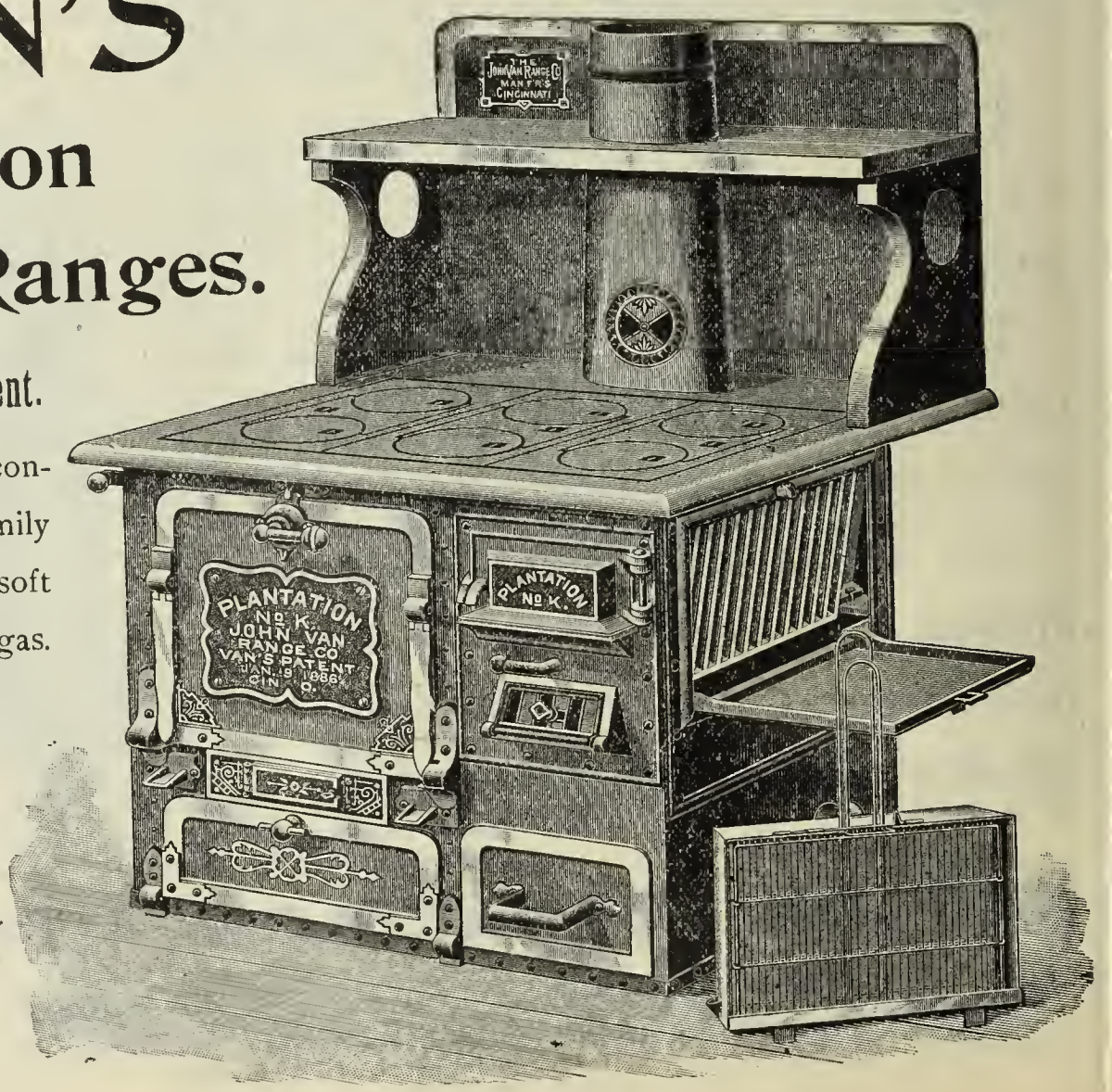
Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston.
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
Rand & Conderman, 822 Girard Ave., Philadelphia, Pa.
E. E. Palmer, Mgr., 1640 No. 3rd St., Harrisburg, Pa.

VAN'S Plantation Ranges.

With Broiler Attachment.

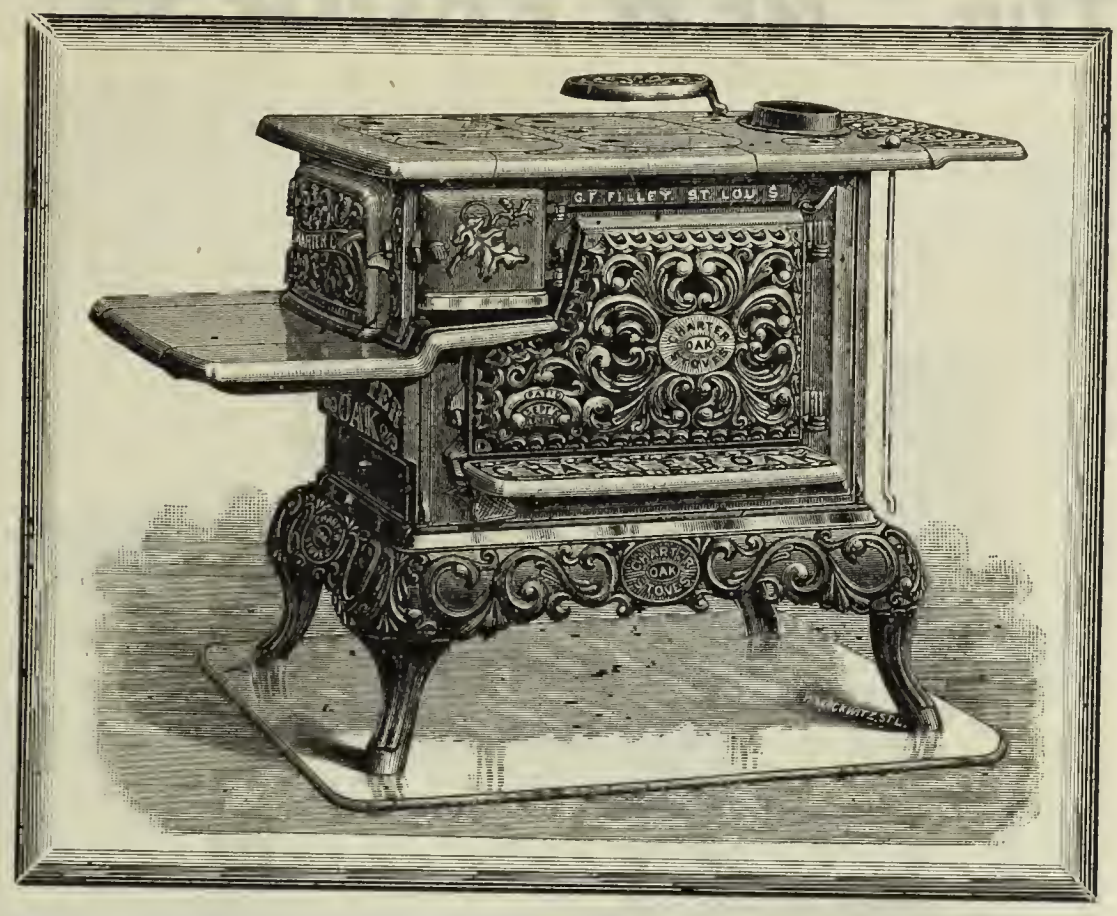
The finest, most convenient and best family range ever offered for soft coal, wood or natural gas. Write for our prices before buying elsewhere. It will pay you.



THE
JOHN VAN RANGE CO.,
Mfrs. of Wrought Steel Ranges, all sizes, and styles,
Cincinnati, Ohio.

THE "NEW CHARTER OAK."

IT'S A BEAUTY AND A SELLER.



YES, "there are others," and they are *all about alike*, differing practically only in name and ornamentation, but there is only one

CHARTER OAK,

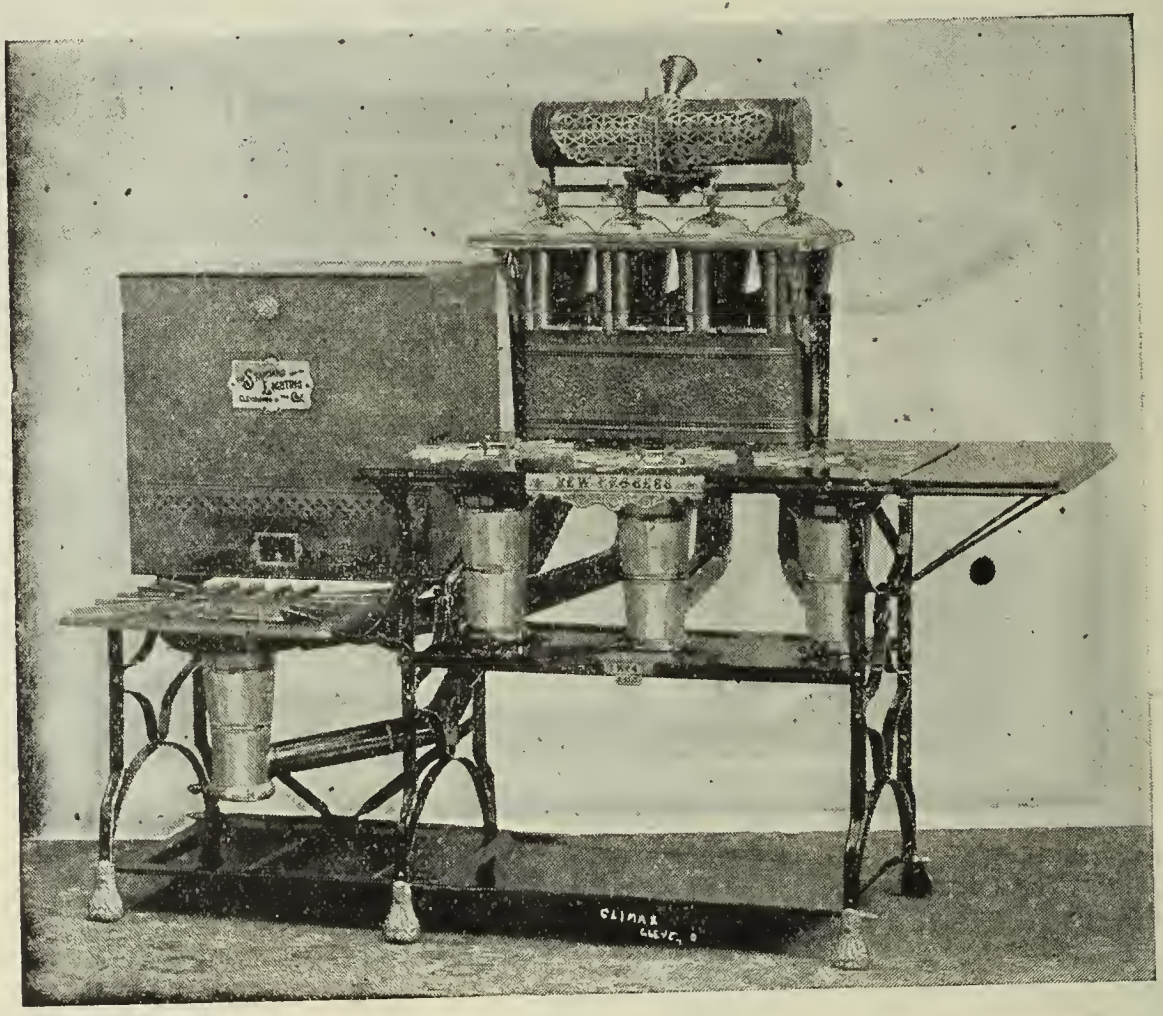
the only specialty in stoves. The best, the handsomest and most profitable for dealer and consumer.

THOSE of your customers who know a GOOD THING when they see and try it, can enjoy the benefits arising from the use of the **WIRE GAUZE DOOR** when they buy this stove. While those who do not appreciate the advantages of admitting fresh air into the oven can also be satisfied, for it is arranged that it can be changed from Gauze to Solid Door by simply closing the gauze by means of a fan shaped Register or Sliding Plate—an arrangement by which air can be adm'tted into or excluded from the oven at will.

Don't you want to be the **Only Dealer** in your city that sells the **only line of stoves that cannot be duplicated?**

EXCELSIOR MANUFACTURING CO., - St. Louis, Mo.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

—MADE ONLY BY—

THE STANDARD LIGHTING CO.,

CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

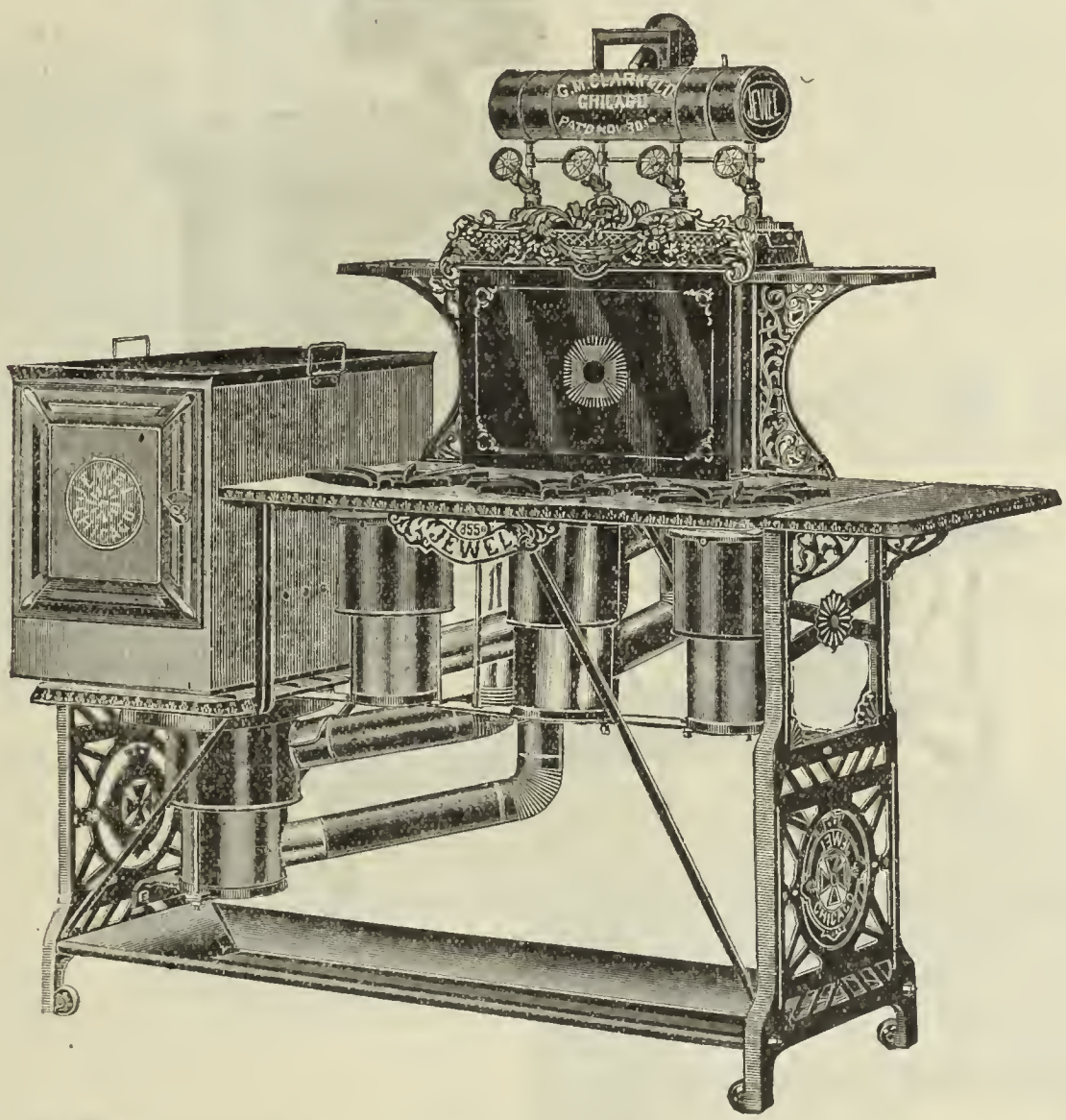
Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St, Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co, Terre Haute, Ind.
Milton Rogers & Sons, Omaha, Neb.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
H. Wetter Mfg. Co., Memphis, Tenn.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

WRITE FOR CATALOG.

George M. Clark & Company,

MAKERS,

149-161 Superior Street, - - CHICAGO.

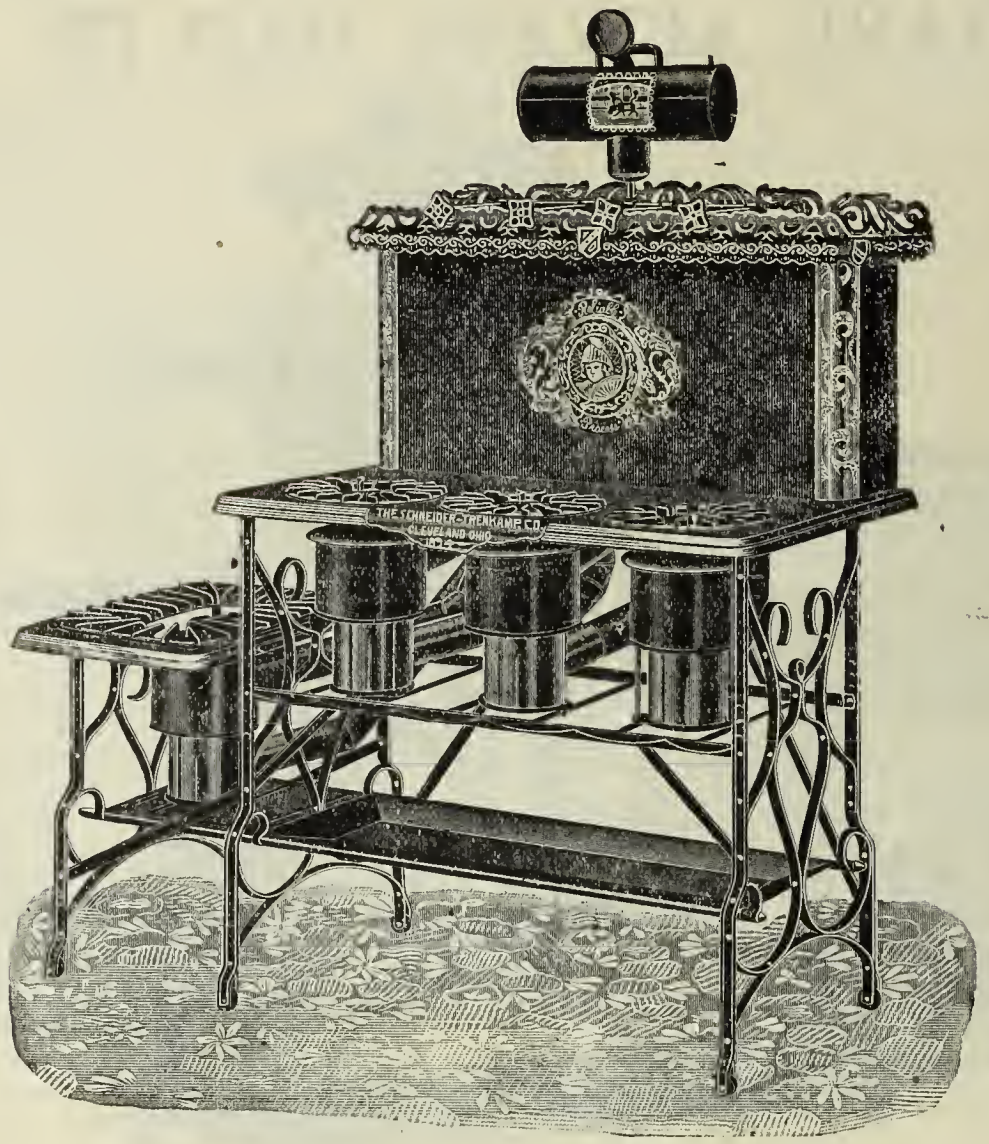
SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
BARSTOW STOVE CO., New York, N. Y.
W. W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

There are OTHERS,

But none that compare with the "Reliable."

SEE ? ? ?



This is not the only one,

Oh my, no. There ARE others,

as illustrated in our 1895 Catalogue, which can be had by writing

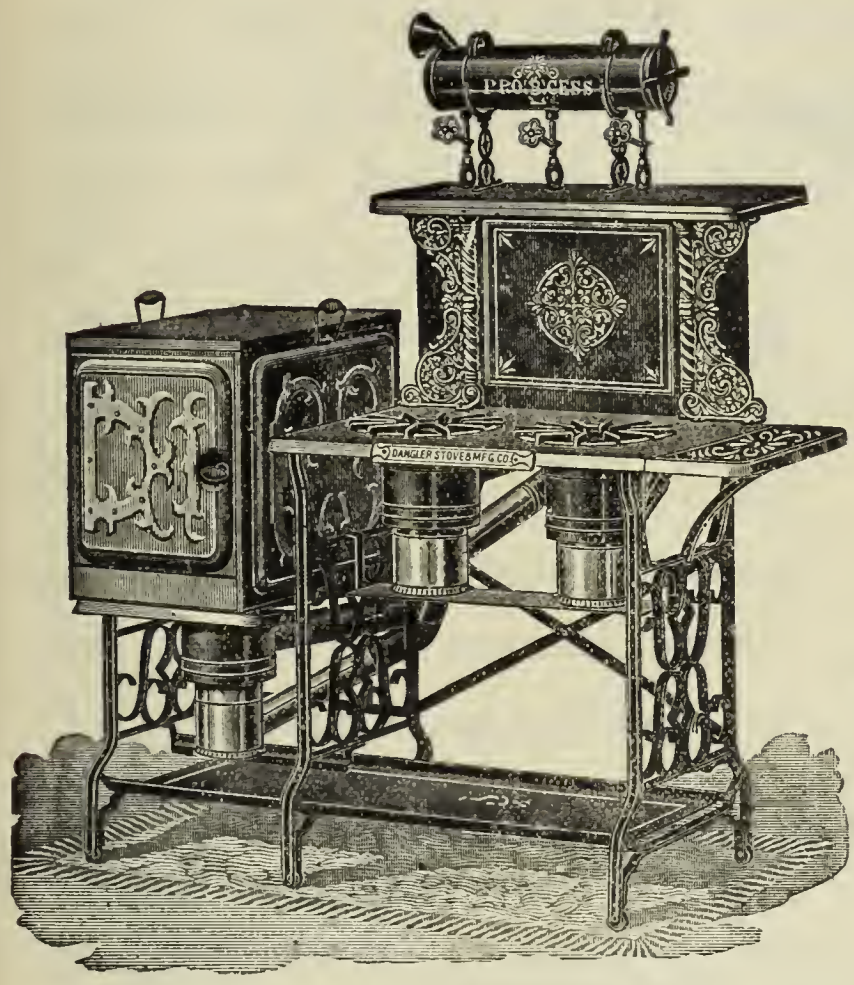
THE SCHNEIDER & TRENKAMP CO.,

67 Lake Street, Chicago. Cleveland, O.

OR OUR AGENTS:

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
CHAS. F FOX Dayton, O.—S W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland, Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.
S. FAITH & CO., Philadelphia, Pa.—Eastern Pennsylvania and New Jersey.
HUNNICUTT & BELLINGRATH, Atlanta, Ga., and Vicinity.

Facts of Interest to the Public.



Our "PROCESS" for 1895, we can say unqualifiedly, is the

MOST PERFECT WORKING

PROCESS STOVE EVER PLACED ON THE MARKET, and HAS NO EQUAL.

In calling attention to our

NEW GEM STOVE,

We offer the trade a STOVE FOR THE PEOPLE and FOR THE TIMES.

THE GEM STOVE is CONVENIENT

in SIZE, with the same sized flame as the PROCESS doing the same amount of work with **less fuel,** and at an original cost of only about ONE-HALF that of the regular high Stoves. This Stove is ABSOLUTELY our own, and CAN BE MADE ONLY BY US, and as pioneers in this business, the public naturally look to us for progress, while some of our competitors, who can only make the old line, call such improvements, "an innovation." Our GEM and PROCESS, together with our DELIGHT, celebrated JUNIORS, Individual and Single Generator Burner Stoves, &c., will give our trade a decided advantage over their competitors,

Write for Catalogue, 1895.

—THE—

Dangler Stove & Mfg. Co,

CLEVELAND, O.



WHOLESALE AGENTS:

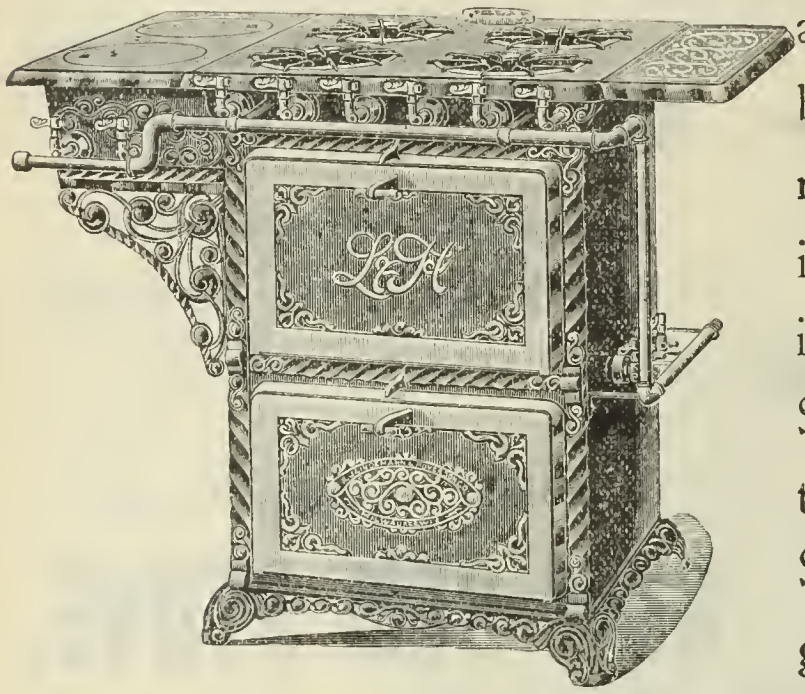
E. H. Huenefeld, Cincinnati, O.
Standart Bros., Detroit, Mich.
Mt. Penn Stove Works, No. 111 N. 2d St., Philadelphia.
Mt. Penn Stove Works, Reading, Pa.
Barstow Stove Co., No. 228 Water St., New York.
Barstow Stove Co., No. 56 Union St., Boston.
Home Stove Co., Indianapolis, Ind.
J. P. Lindeman & Sons, Milwaukee, Wis.
R. Robinson & Sons, Chicago, Ill.
Richards-Conover Hdw. Co., Kansas City, Mo.
The Stollberg-Clapp Co., Toledo, O.
Weber & Gebhart, Dayton, O.
Bradley & Munk, Columbus, O.
Foster-Stevens Co., Grand Rapids, Mich.
The Schaab-Puff Stove Co., St, Louis, Mo.
Dunlay & Geisler, Houston, Texas.
A. Baldwin & Co., Ltd., New Orleans, La.
M. F. Tallmage, Buffalo, N. Y.
W. E. Galbreath, S. E. cor. Lombard and Light Streets, Baltimore, Md.
The Ochsner & Orcutt Co., Sioux City, Iowa.

The L. & H. GAS RANGE

We claim superior.

It has the following improvements:

Removable oven, adjustable valve for all kinds of gases and pressures, needle point valve with lever handle with words "Open and Close" on them. Counter balance drop door. Best baker made. Complete in all detail. It is strictly first class. Buy it, try it, and you will have no other. Send for new catalogue. It contains the largest assortment of Stoves, Ranges, Ovens, &c., for gas, gasoline and kerosene.



A. J. LINDEMANN & HOVERSON CO.,

Branch House, Chicago, Ill. MILWAUKEE, WIS.

P. S.—Notice this advertisement. It will show a new improved stove every week.

A Good Creed.

Do not keep your love and tenderness sealed until your friends are dead. Fill their lives with sweetness. Speak approving, cheering words while their ears can hear them and while their hearts can be thrilled and made happier by them. The kind things you mean to say when they are gone, say before they go. The flowers you mean to send for their coffins, send to brighten and sweeten their homes before they leave them. If my friends have alabaster boxes laid away full of fragrant perfumes of sympathy and affection which they intend to break over my dead body, I would rather have a plain coffin without a flower, funeral without a eulogy, than a life without the sweetness of love and sympathy. Let us learn to anoint our friends beforehand for their burial. Post mortem kindness does not cheer the burdened spirit. Flowers on the coffin cast no fragrance backward over the weary way.—*West Jersey Press.*

— NEW AT THE BUSINESS.—She was a new telephone girl. "What number please?"

"One hundred and fifteen."

"I didn't catch that."

"One hundred—"

"Yes."

"And fifteen."

"All right. Here is one hundred. Fifteen is busy just now.—*Harper's Bazaar.*

— IT is when a woman gets caught in a shower with a new hat on that you may realize what a rain of terror is.—*Exchange.*

— WIGGS (quoting): "There's nothing like leather, you know, old boy."

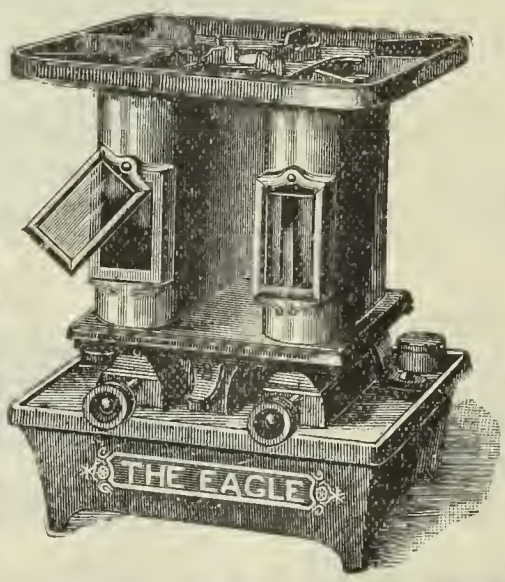
Waggs: "Isn't there, though! You never saw any of the pie crust that our new hired girl turns out."—*Somerville Journal*

ORIGINAL

"BEAUTY OIL STOVES."

Central Draft, Double Roller Burners.

TROY OIL STOVE CO., - - Troy, N. Y.



GRINBERG BROTHERS,

MANUFACTURERS OF THE

EAGLE BRAND

Gas and Oil Stoves,

STIFF and ADJUSTABLE SHEET METAL

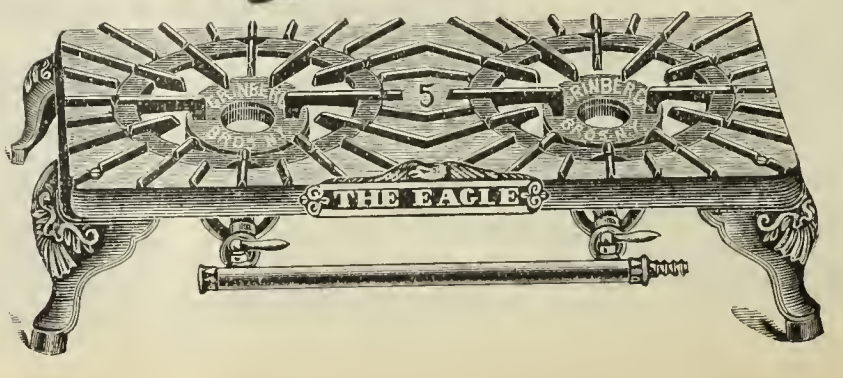
ELBOWS,

Stove Pipes, House Leaders, Hot Air Pipes, etc.

STOVE PIPES NESTED FOR SHIPPING.

154 and 155 SOUTH STREET,

Near Peck Slip, *NEW YORK.*



DEALERS

EVERYWHERE SHOULD CONSIDER THE FOLLOWING:

THEY CANNOT FAIL TO FIND SUITED TO THEIR TRADE,

Gasoline Stoves, Oil Cooking Stoves,
Oil Heating Stoves, Lamp Stoves,
and Gas Hot Plate Stoves,

Together with Full Lines of Ovens and Furniture

In the following Large Assortment of First-Class, Popular and Reliable Goods we are offering

"AURORA" Process Gasoline Stoves.

"ARGAND" mproved Junior Lines, High, Low and Step Gasoline Stoves.

"ROYAL" Round Wick, High and Low, Oil Cookers, with new and desirable features.

"ROYAL" Flat Wick, all Cast, Nickel Finish, Oil Cookers
The Largest Line at Low Prices on the Market.

"ROYAL" Lamp Stoves, One, Two and Three Burner. Polished Nickel Finish, Sheet Iron Chimneys, Brass Burners.

"JOCKEY" Lamp Stoves, One, Two and Three Burner. Japan and Bronze Finish, Tin Chimneys, Cast Burners.

"SHOO-FLY" Lamp Stoves, One, Two and Three Burner. Japan Finish, Tin Chimneys, Tin Burners.

"SHOO-FLY" Double Lamp Stoves, with Two and Four Hole Extension Tops. Mounted on Highly Ornamental Base, Finished in Polished Nickel and in Japan.
All our "Shoo-Flys" are great sellers.

GAS HOT PLATE STOVES.

Full Nickel, White Nickel and Plain Finish.

"CHAMPION" Two and Three Burner.
Special New Line, 1895.
Large, Smooth Top Surface, something entirely new, stands high, and has our Removable Burner and Air Adjuster. The most common sense stove ever made.

"MAGIC" Two and Three Burner.
Special New Line, 1895.
Popular priced, Large Flush Top Surface, stands high, has Double Burner and Air Adjuster.

"ARGAND" One Two and Three Burner. Flush Top, Double Removable Burners, Beautiful Design.

"FIRE-FLY" One, Two and Three Burner. Flush Top, Double Removable Burners, Popular Priced and a great seller.

Also New Line "ROYAL" Oil Heaters.

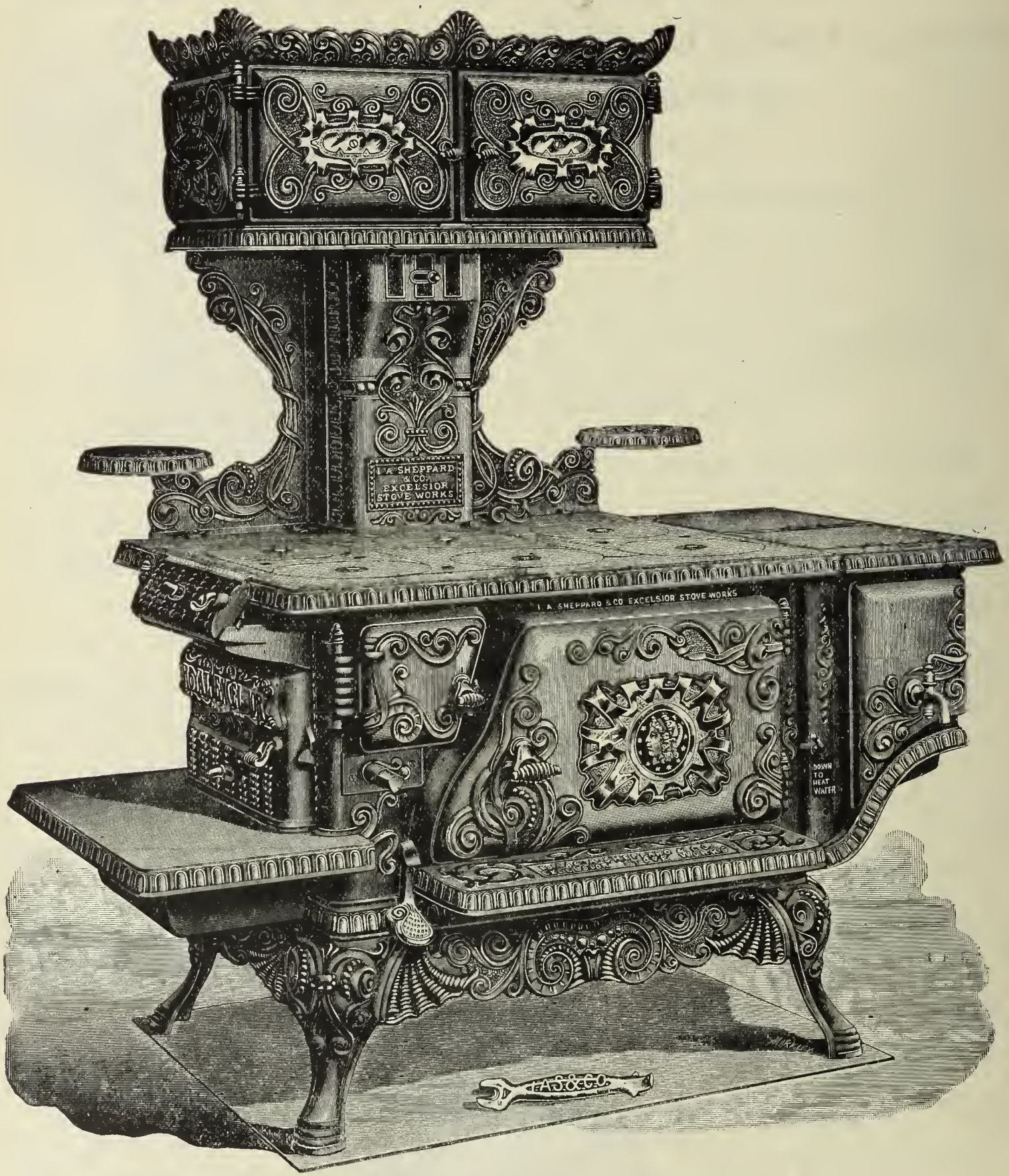
With such an assortment of First-Class, Popular and Reliable Goods to select from we believe it will pay you to see us before buying elsewhere.

THE PERRY STOVE CO.,

ALBANY, N. Y. **242 Water St, New York City.**

SOMETHING NEW AND STRIKING:

The Royal Excelsior Ranges!



Eighteen Sizes and Varieties.

(Cut shows Six-Hole Range With Reservoir, High Hot Closet and Cup Brackets.)

These goods will set your trade in motion this spring and keep it going indefinitely.

See Description on Opposite Page.

ISAAC A. SHEPPARD & CO., { PHILADELPHIA, PA. / BALTIMORE, MD.

MANUFACTURERS,

Admirable Trade Accelerators!

RANGES THAT SELL!

To sell goods now-a-days they must fairly bristle with good points. When Mrs. Noah moved out of the ark and set up housekeeping on Mount Ararat, she might have been satisfied to bale out hot water from an encased reservoir with a dipper (always spilling some on the stove top, of course), but modern housekeepers prefer to draw it off through a spigot, as those who use the **ROYAL EXCELSIOR RANGES** do. (This is our own patent. That is why you don't find other manufacturers using it.) Then there is also our "**ECLIPSE COVER,**" Three points: 1. Shape makes it strong—no place in it for a crack to start. 2. Cover lifted ***at center of gravity,*** the easiest possible way to lift a weight. 3. Cover lifted at once ***from any position***—no pulling or pushing it around to bring lifter hole toward the operator.

Eclipse Cover.
Patented December 29, 1891.



Damper easily replaced through pipe collar, having no rods to warp or burn out. Large end Hearth, sliding forward. Deep, roomy Ash Pit, Bailed Ash Pan, &c. Fire Box fitted for Wood, or Hard Coal, or Soft Coal, as desired Grates quickly removed without disturbing Fire Box Linings. Cross pieces so arranged as to bring four boiler holes directly into contact with the fire. Water Fronts for all sizes, with connections taken from the back to either right or left of range, so that circulating boiler may be used on either side. The Feet are independent of the Skirt Base, which bolts to the feet after the Range is set up, thereby enabling one man to put the entire apparatus in place. The design is the work of a superior artist. All edges are beautifully ornamented, and will look well as long as the range lasts. (Ground edges are hard to keep from rusting while goods are in stock, and turn blue and lose their good looks at the first fire. The ornamented edge is one of the greatest improvements of modern stove making.)

The mounting and fitting are of the best, and the added features of Nickeled "Alaska" Knobs, Nickel Name Plate, Nickel Oven Door Panel with Tile Center, Nickel Hinge Pins and Nickel Oven Door Pedal enhance the attractiveness of the goods

We cannot tell you all about these goods in a moment. Send to us for a descriptive and fully illustrated catalogue-circular. They are made with either four holes or six holes on top and with or without Reservoir.

If you buy one of these ranges, blacken it nicely and put it in a conspicuous place on your store floor, and if within 30 days you are not satisfied with it, you may send it back at our expense. (If you keep it over 30 days, of course it's a sale.) Does this proposition strike you as fair?

ISAAC A. SHEPPARD & CO.,

Philadelphia and Baltimore



CHARLES NOBLE & CO.
LIBERTY STOVE WORKS.

Liberty Stove Works.

HOME LIBERTY RANGE,

With Horizontal Boiler.

TWO SIZES.

Five or six holes. Collar on top or back.
Right or left hand ovens.
Plain or duplex grates.
With or without High Closet.
With Low Closet or **Base.**

Especially adapted to BUILDING TRADE.

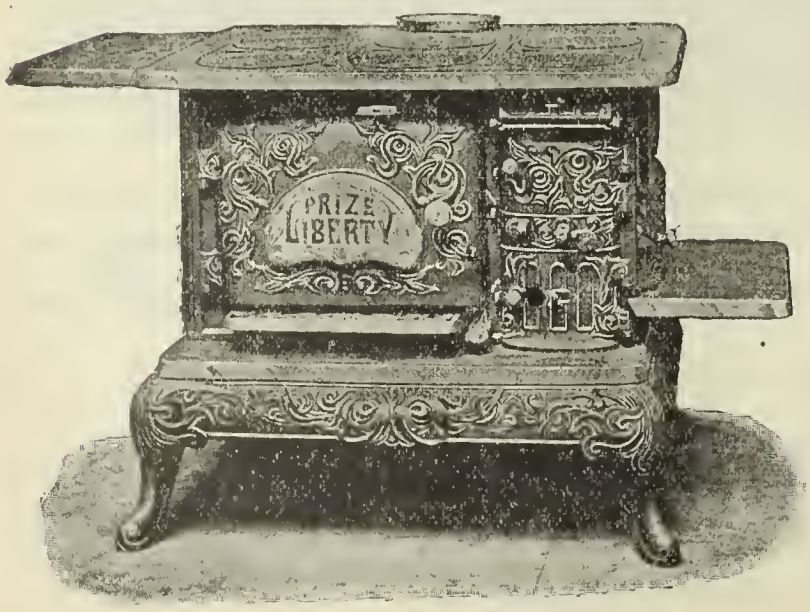


PRIZE LIBERTY RANGE.

For VERTICAL BOILER.

WITH ALL THE VARIATIONS AS ABOVE.

Also adapted for setting in between brick jambs.



PRIZE LIBERTY RANGE,

With Feet and Skirting.

Open or closed ends, with the same variations.

Correspondence solicited.

CHARLES NOBLE & CO.,

PHILADELPHIA.

Welcome Stoves and Ranges.

KERNAN WELCOME RANGE.



Two Sizes, Portable or Brickset, Nos. 7 and 8. Made with Oven either Right or Left of Fire Box.

WE HAVE embodied in this Range all that years of experience can suggest, both in ornamentation and construction. The design is unusually pleasing, with large Top Surface, large Fire Box and Oven. We furnish with Duplex, Dockash or Plain Flat Grates. Our Fire Box is so arranged that the grate pulls out through the front opening without disturbing the water back or brick. Those who have repaired old style ranges will appreciate this improvement. Sheet Flue of ample size, guaranteed a quick baker and worker. Hot air for upper rooms is drawn from base and back of Range without interfering with the water back or Baking of Stove.

The Progressive dealers in Stoves and Ranges will find it wise to investigate and secure the sale of this modern Range. Write for Circulars and Prices.

—MANUFACTURED BY—

Syracuse Stove Works,

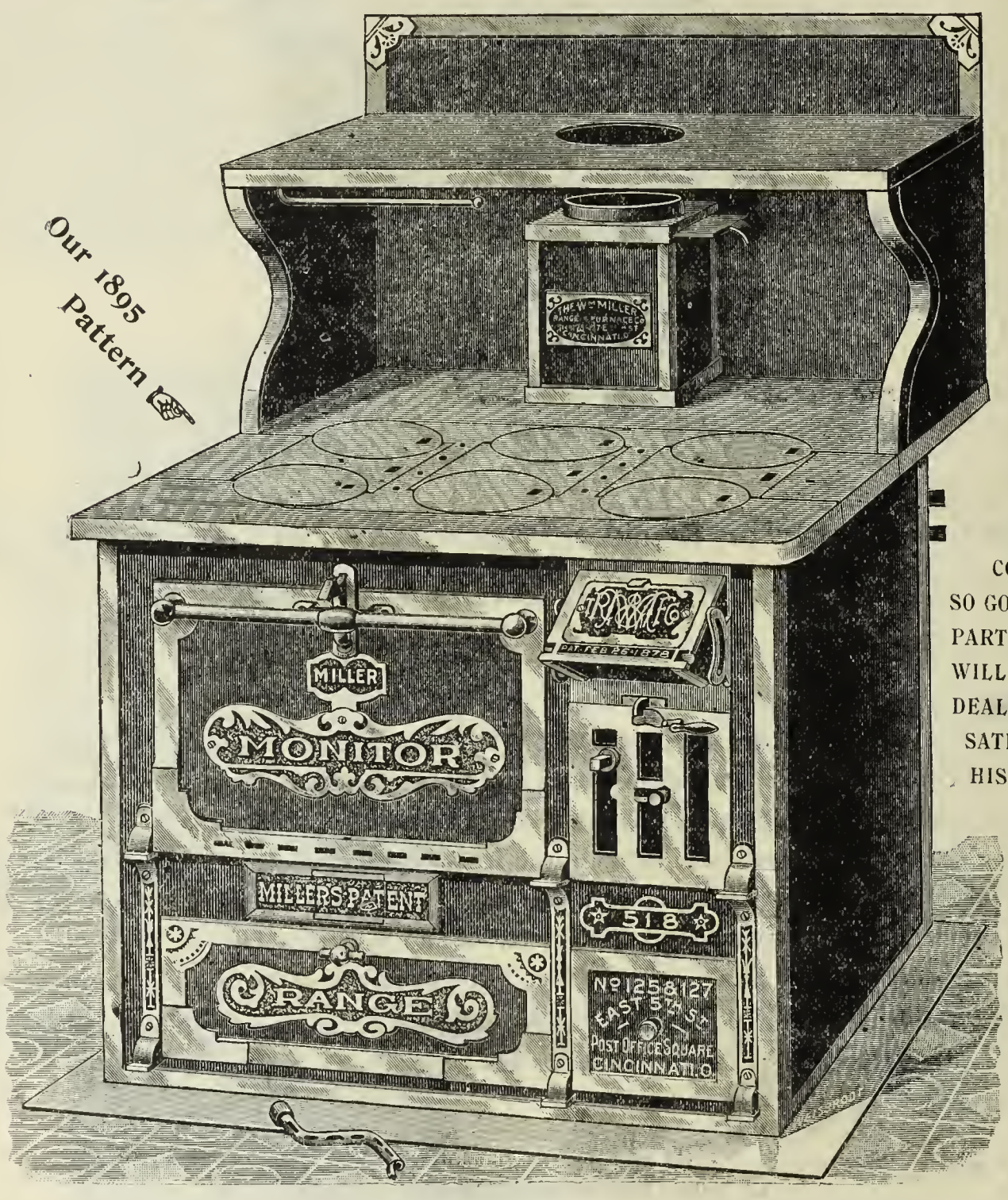
Syracuse, N. Y.

Do you intend to remain in the Stove business? If so, the time has come for you to place a line of Steel Plate Ranges on your floor, to keep the trade from going to your competitor. But in making your selection, be careful to select only the best.

Miller Monitor

ALL STEEL

RANGES



ARE IN ALL THEIR VARIOUS SIZES AND STYLES, OF WHICH WE MAKE A GREATER VARIETY THAN ANY OTHER MAN'F'R IN THE WORLD, THE ONLY LINE SO COMPLETE AND SO GOOD IN EVERY PARTICULAR THAT WILL ENABLE THE DEALER TO OFFER SATISFACTION TO HIS CUSTOMERS. THERE ARE OTHERS— BUT THEN YOU KNOW THE REST. WHY NOT GET OUR CATALOGUE AND PRICES?

All Kinds of Hotel Implements for Culinary Purposes

——MANUFACTURED AND FOR SALE BY——

The Wm Miller Range & Furnace Co,

Nos. 9 & 11 West 5th St., CINCINNATI, O.

AGENTS:

W. R. KENYON HDW. CO., Butte, Mont.
MILTON ROGERS & SONS, Omaha, Neb.
HOLLY, MASON, MARKS & CO., Spokane, Wash.
TACOMA STOVE CO., Tacoma, Wash.

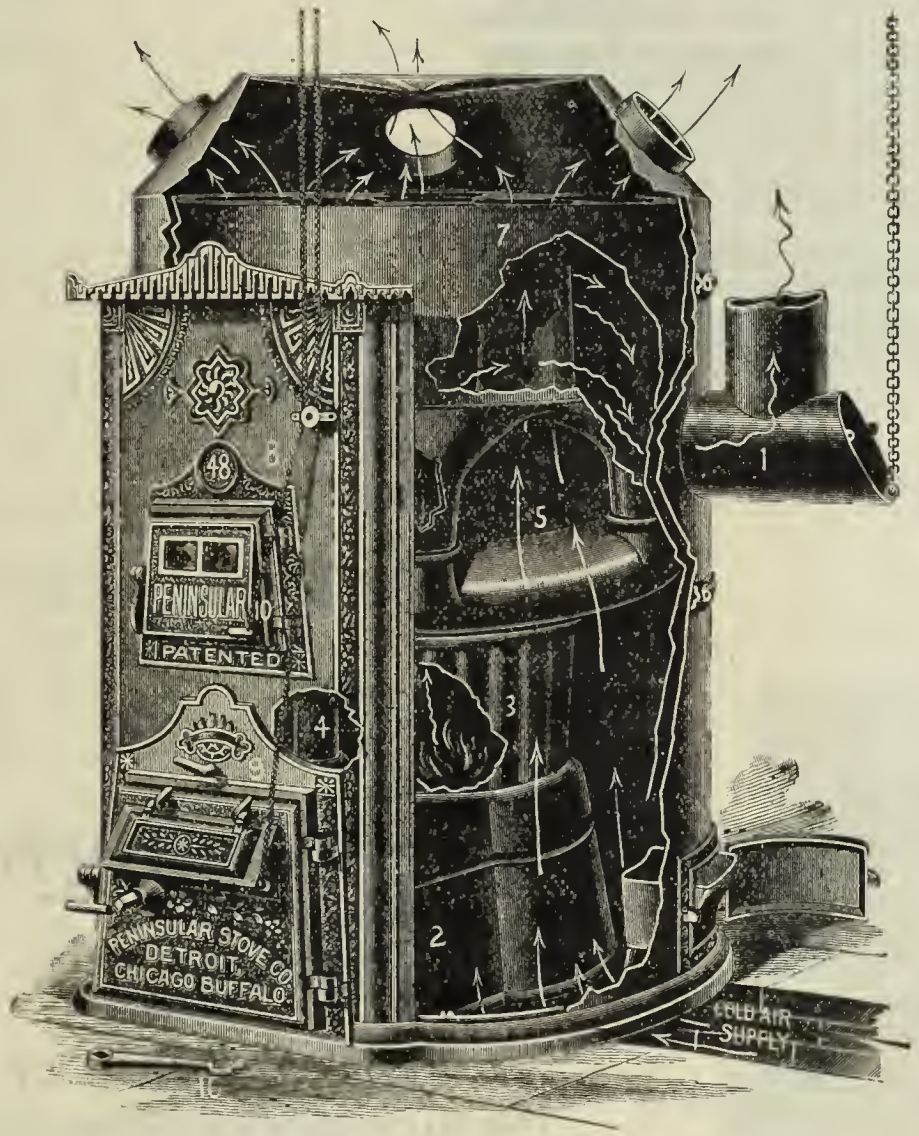
THE JOHN SCHRAM CO., Seattle, Wash.
F. S. LANG & CO., Helena, Mont.
H. WETTER MFG. CO., Memphis, Tenn.

HOLBROOK, MERRILL & STETSON (for Pacific Coast), San Francisco, Cal.
Z. C. M. INSTITUTION, Salt Lake City, Ogden and Logan, Utah.

PENINSULAR FURNACES.

HOT WATER AND WARM AIR AND WARM AIR ONLY.

PRICES TO SUIT ALL.

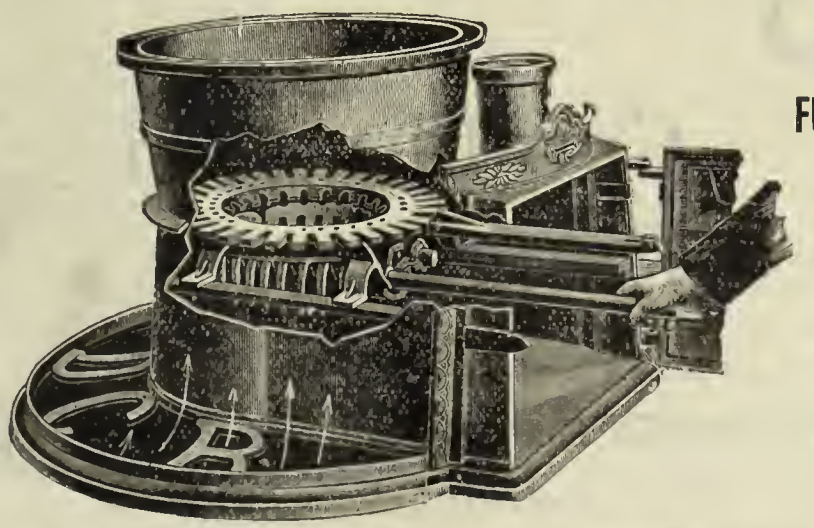


THE LARGEST AND MOST COMPLETE VARIETY OF STYLES AND SIZES, AND FOR EVERY KIND OF FUEL.

THE PENINSULAR DUPLEX GRATE AND ANNULAR SHAKING RING

CAN BE WITHDRAWN WITHOUT REMOVING A SINGLE PLATE OR BOLT.

AS USED IN ALL OUR FURNACES AND OWNED EXCLUSIVELY BY US.



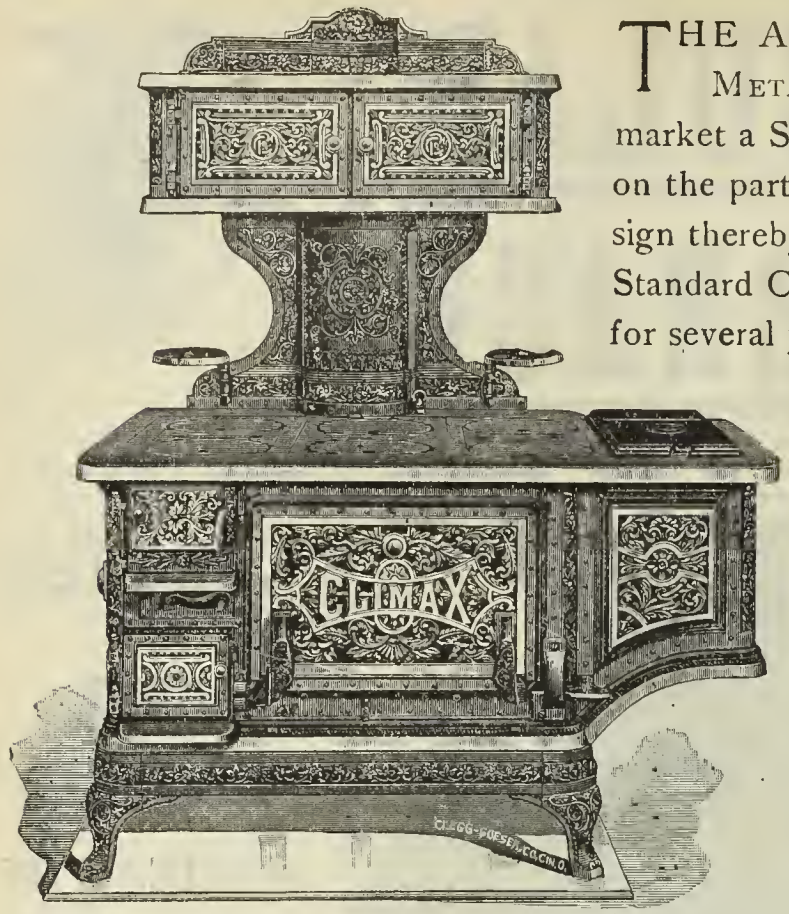
WRITE FOR CATALOGUE.

ASK FOR DISCOUNTS

A Written Guarantee Accompanies Each.

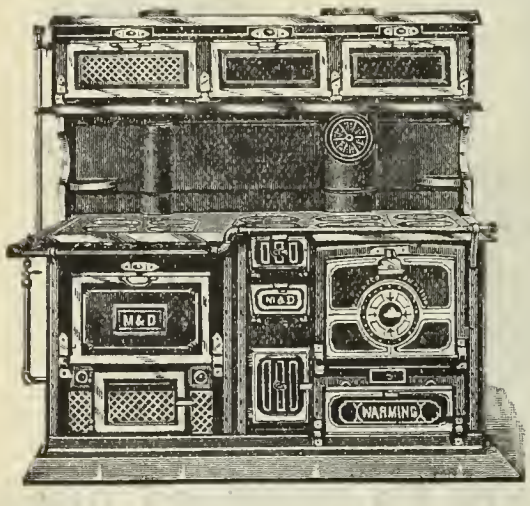
The Peninsular Stove Co.,

DETROIT. CHICAGO. BUFFALO.



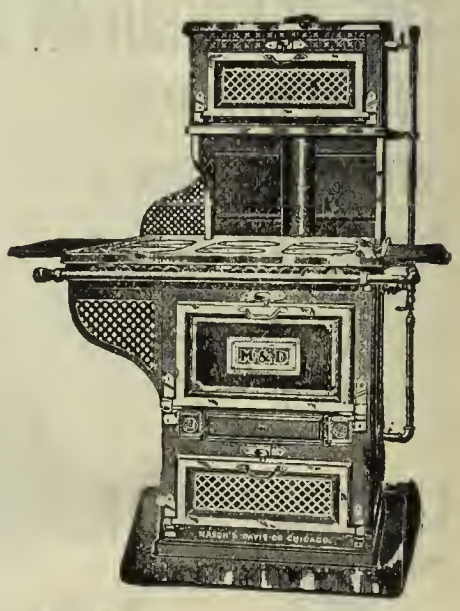
THE ANNOUNCEMENT in a recent issue of THE METAL WORKER that we are soon to place on the market a Steel Climax Range having prompted the inquiry on the part of some of our patrons as to whether we design thereby to abandon the manufacture of our Celebrated Standard Climax Range, which has maintained supremacy for several years as an established leader of its class and against which not a single complaint has been filed in our office, we desire by this to inform the trade that the reputation of the Climax Range and constantly increasing demands for same is such as to preclude the possibility of abandonment if we felt disposed to do so. The Range, we are pleased to say, is more popular than ever, and the manufacture of same will be continued in all its varied conventional styles and sizes, and we sincerely trust that none will be deceived into a belief that an ***imitation*** now being offered to the trade is as good as the initial construction, which can only be procured of

TAPLIN, RICE & CO., AKRON, OHIO.



M & D
Wrought Steel Ranges
For Coal, Wood or Gas.
150 DIFFERENT STYLES AND SIZES.

M & D
Combination Range



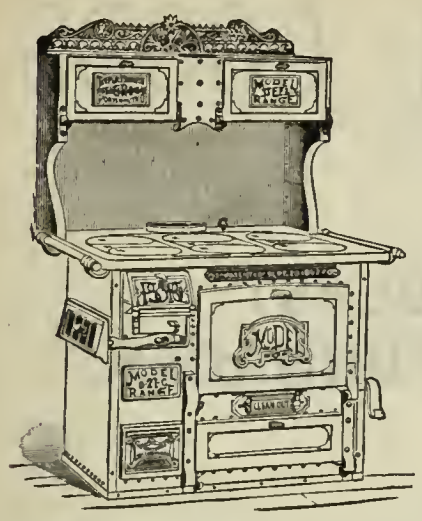
For Coal and Gas or Wood and Gas. Single Oven and Double Oven, Gas and Coal Ranges.

SEND FOR CATALOGUE.

MASON & DAVIS CO.,
72 LAKE STREET, CHICAGO.

---

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.



BEHOLD! The Leaders.

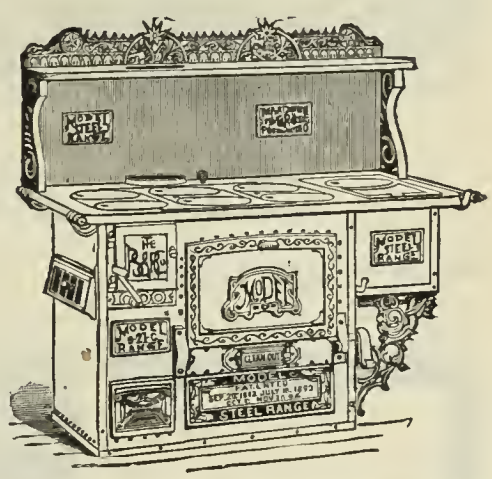
(You can't see the others—too far behind.)

"Model" Steel Ranges

have done more to popularize Steel Ranges than any other one factor. Why? Because they are absolutely the best, and the price brings them within the reach of all.

The Portsmouth Stove and Range Co.,

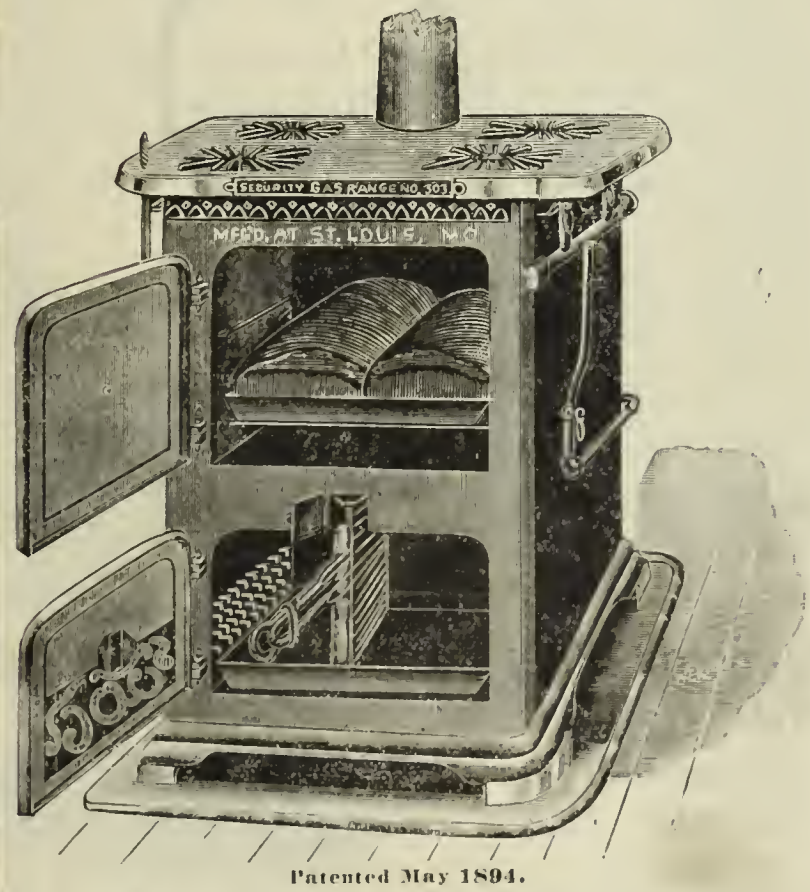
Portsmouth, O.



Agents:

R. ROBINSON & SONS, Chicago.
C. F. HAKE & SONS, Cincinnati.
HOME STOVE CO, Indianapolis.
W. E. ANTHONY & CO., Detroit.
BRADLEY, MUNK & CO., Columbus.

The Security Gas Range



Patented May 1894.

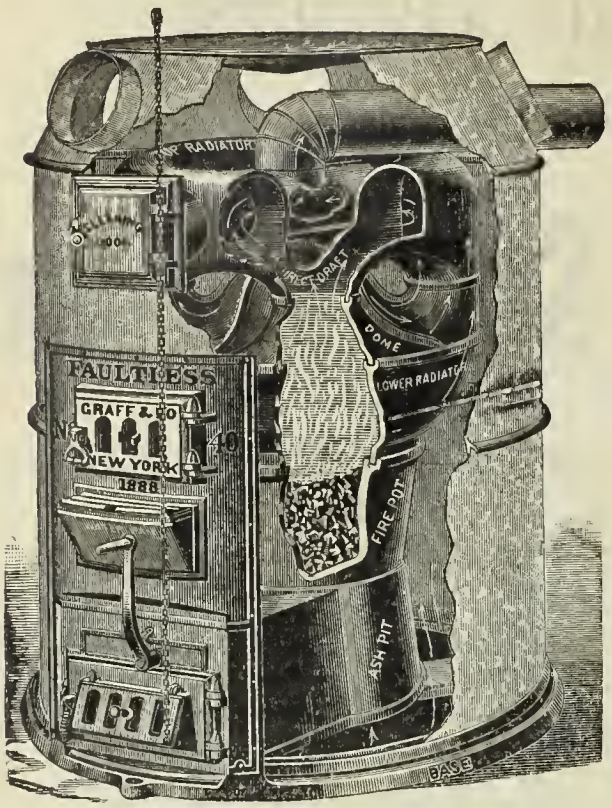
with improvements up to date. Has double oven, which is guaranteed to do double the work of any ordinary oven at less cost. It is made for family use, and has proved wonderfully successful wherever introduced. It will cook, bake, roast, and is the only stove which will **barbecue a steak, and will also heat water quicker than any other gas stove on the market.** It is strongly built, neatly and tastily decorated, and will prove ornamental as well as useful.

Write at once and secure the agency. Also send for illustrated catalogue and price-list.

L. B. JONES, 1803=5-7 Chouteau Ave., St. Louis.

Successor to Security Gas and Vapor Stove Co.

FAULTLESS.



SUPERIOR GOODS.

FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.
HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.

Faultless, Elegant and Columbian Ranges.

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.

FREE

THE TRIUMPH - - FURNACE ESTIMATE BOOK.

The Principles of Heating and Ventilation, with Facts and Figures.

The Triumph Picture Book.

THE DEALERS' BEST LINE.

The Triumph Special,
for hard coal. 5 sizes

The Triumph all Cast,
hard or soft coal. 5 sizes.

The Triumph King,
hard or soft coal. 4 sizes.

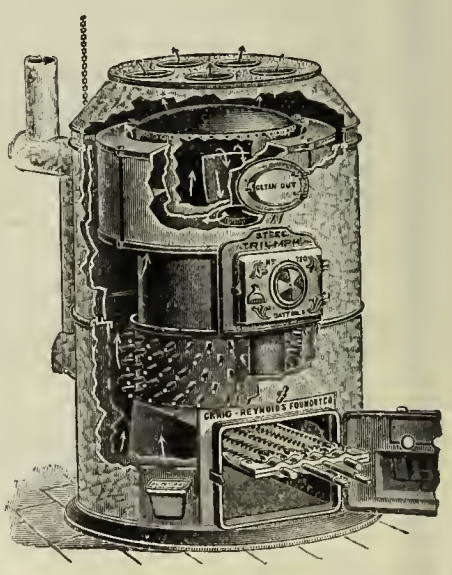
The Triumph Steel,
hard coal. 5 sizes.

The Triumph Air Blast,
soft coal. 5 sizes.

The Triumph Combination
for hot water and air. 5 sizes.

Every Dealer Ought to Have One.

1895 CATALOGUE OF THE TRIUMPH FURNACES.



The Craig-Reynolds F'd'y Co.,
DAYTON, OHIO.
WESTERN BRANCH:
GEO. D. HOFFMAN, Mgr.,
82 Lake St., Chicago, Ill.

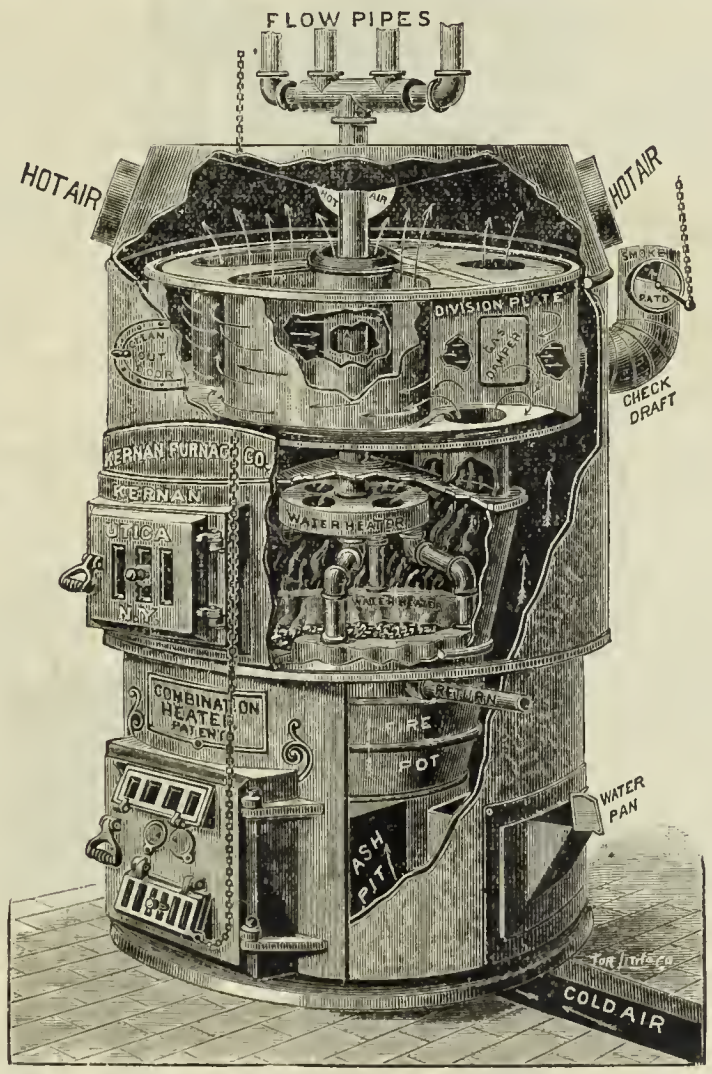
Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.

KERNAN

Combination Furnace.

Good Thing.

Push It Along.



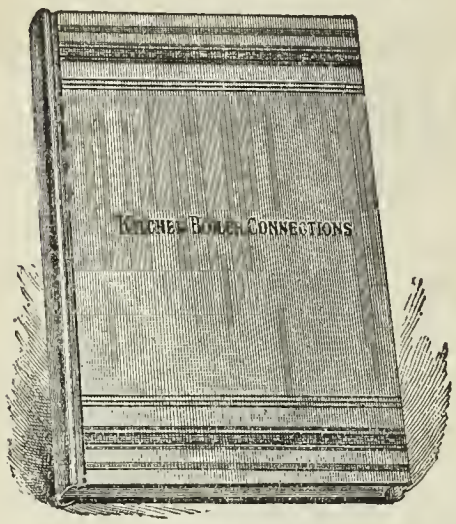
Write for Catalogue and Prices.

Kernan Furnace Company,

CHICAGO, ILL. UTICA, N. Y.

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth.

Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

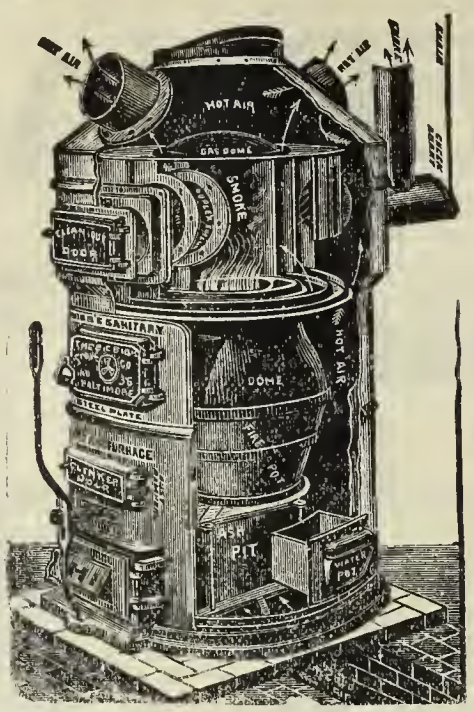
Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome.—*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

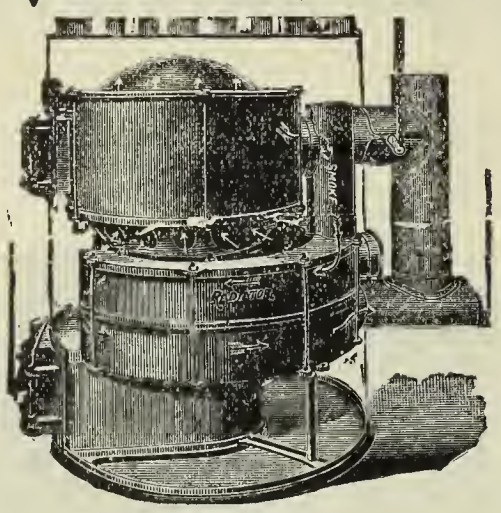
Baltimore Fire Place Heaters,

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM: COLD AIR FLUES INSIDE.

DOUBLE RADIATOR BELOW THE DOME: SECTIONAL FIRE POTS; STAR GRATE.

IT IS A GREAT ECONOMIZER OF FUEL.

IT IS A LOW FURNACE.

CORNING, N. Y., January 16, 1895.

Gentlemen: The No. 40 Victor you set in '91, and the No 45 Victor set in '92 are doing good work, with an economical use of coal, and this month the Thermometer has shown on several days a record from 7 to 22 degrees below zero.

Respectfully yours,
J. P. YOUNG.

Agents wanted. Address

THE CORNING MANUFACTURING CO.,
Corning, N. Y.

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best
—FOR—
Steam or Hot Water Heating.

—o—

Send for Catalogue.



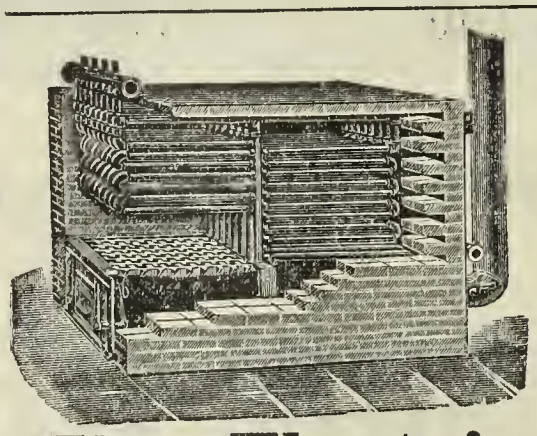
The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

Packed Joints.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

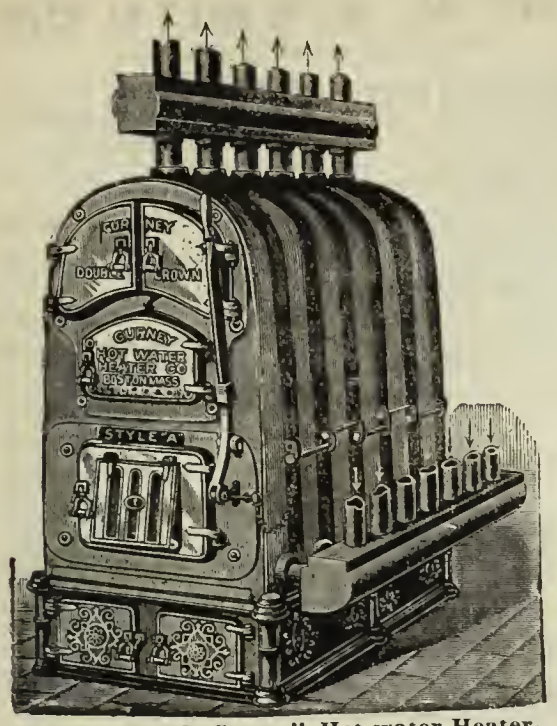
Over 300 Different Sizes.

SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST.,
ROCHESTER, N. Y.

New York Office, 44 Dey Street.



Gurney "Double Crown" Hot water Heater. Style "A."

A GUARANTEE OF EXCELLENCE.

The Name **Gurney**

Used in connection with **Heating Apparatus** denotes **FINEST PRODUCTION.**

HOT WATER HEATERS, STEAM BOILERS, RADIATORS.

ALWAYS EQUAL TO THE OCCASION.

Send for Trade Catalogues.

SOLD ONLY TO THE TRADE.

GURNEY HEATER MAN'F'G CO.,
163 Franklin St., Cor. Congress.
BOSTON, MASS.
Western Selling Agents:
A. A. GRIFFING IRON CO., 34 Dearborn St., Chicago, Ill.

WAIT A LITTLE WHILE.

Our New Catalog

For **1895** is in the printer's hands.

We want you to have a copy of it before you decide about this season's goods.

THE

"STANDARD" FURNACE

will **Lead** the trade as usual.

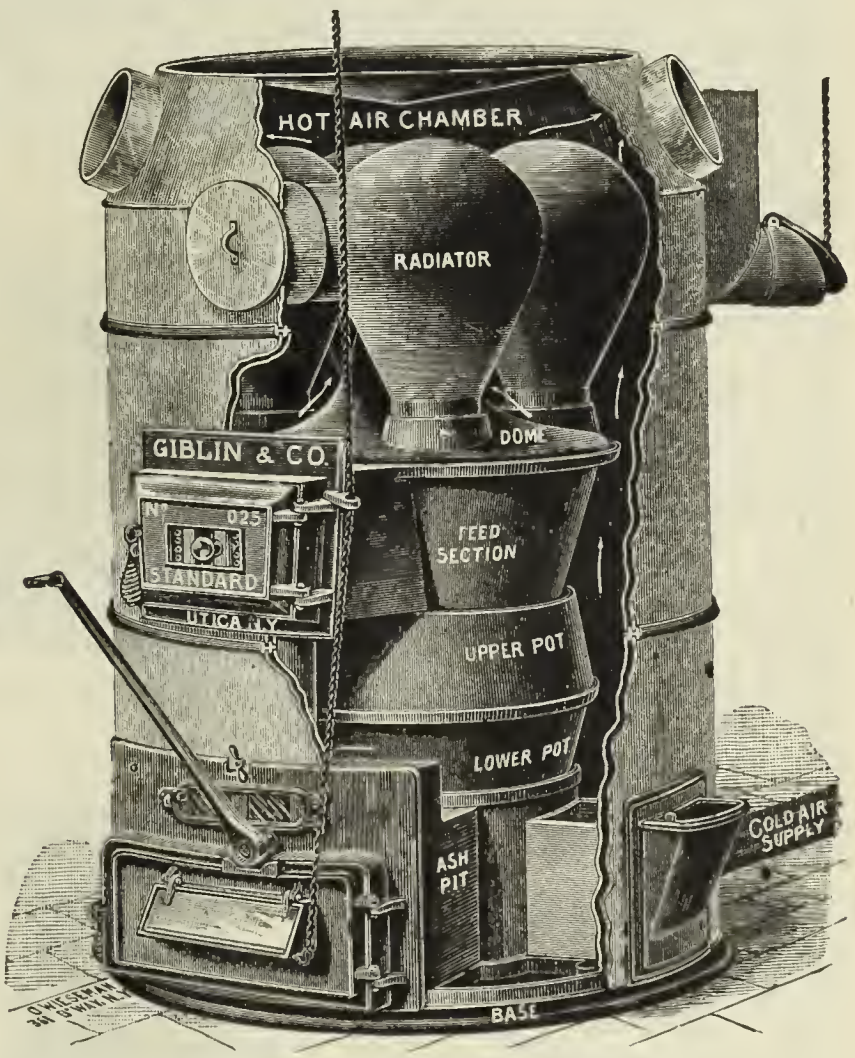
ITS LIKE HAS NEVER BEEN PRODUCED.

YOU OUGHT TO SELL THE BEST.

Exclusive territory. Full protection. Good treatment.

Send name for Catalog.

GIBLIN & CO.,
Utica, N. Y.





The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

139, 141 and 143 CENTRE STREET, - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

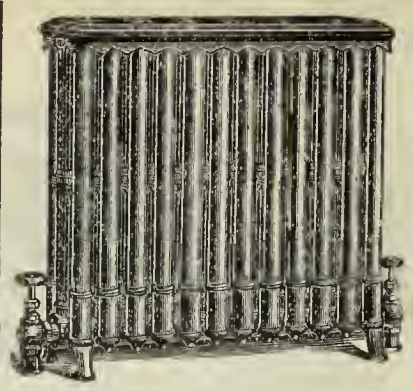
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



Union Radiator.

THE H. B. SMITH CO.

Manufacturers of STEAM AND WATER

Heating Apparatus,

For Public and Private Residences.

SPECIALTIES:

THE UNION AND ROYAL UNION HOT-WATER RADIATORS.
GOLD'S IMPROVED SECTIONAL BOILERS
MILL'S SAFETY SECTIONAL BOILERS.
REED'S IMPROVED CAST IRON RADIATORS
GOLD'S INDIRECT PIN RADIATORS.
BRECKENRIDGE'S PATENT AUTOMATIC AIR VALVES.
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for Hard or Soft Coal.

Office and Warerooms: 137 Centre St., New York.

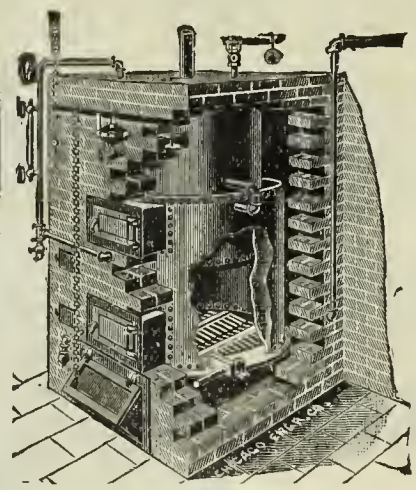
Catalogues sent on application. Foundry, Westfield, Mass.

STEAM HOT WATER WARM AIR
FOR HEATING ALL CLASSES OF BUILDINGS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

CAPITOL HEATERS

UNITED STATES HEATER CO.
113 RANDOLPH ST. DETROIT, MICH
CHICAGO — NEW-YORK — BOSTON.



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use HARD or SOFT COAL.

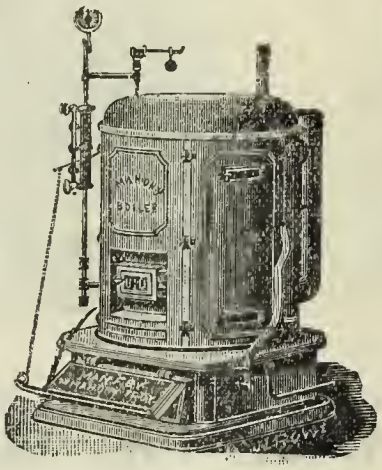
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



THE MAHONY BOILERS.

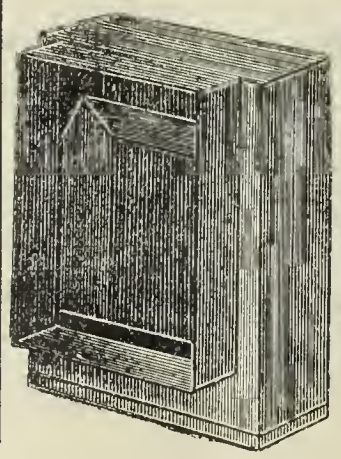
For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



Novelty Ventilated Wall Pipe,

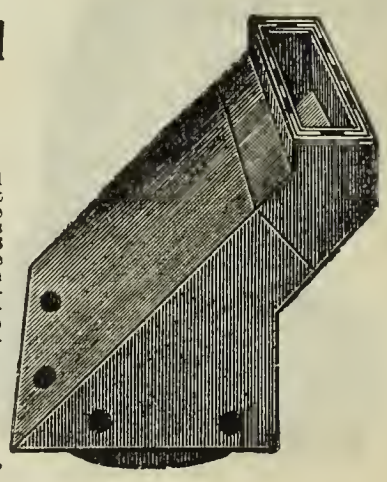
Absolutely Fire Proof.

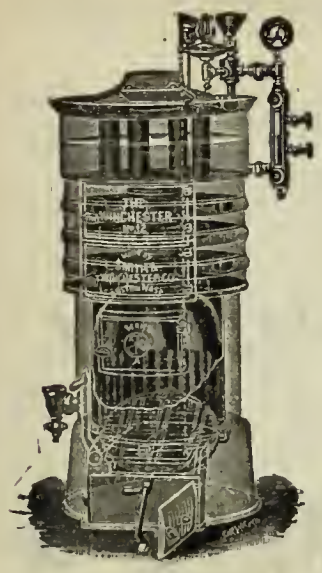
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER,

18 Wood Street, Pittsburgh, Pa.





The Winchester



Has more ***COMMENDABLE***

And less ***OBJECTIONABLE FEATURES***

Than any Heater on the Market.

——MADE BY——

SMITH & WINCHESTER CO., Boston, Mass.

Our prices on these Heaters will please you. Send for them.

LARGEST ASSORTMENT OF STYLES AND SIZES IN THE MARKET.

CORRESPONDENCE SOLICITED. CATALOGUES GIVE FULL DESCRIPTION.

SOLD ON THEIR MERITS NOT ON THEIR ANTIQUITY.

Royal Heaters

COMBINATION.

HOT WATER. STEAM. HOT AIR.

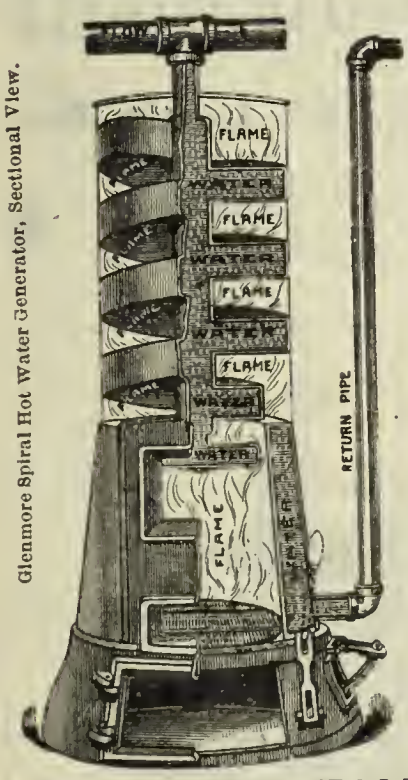
MANUFACTURED BY

HART & CROUSE.

UTICA, N.Y.

NEW YORK 211 WATER ST.

CHICAGO 79 LAKE ST.



Glenmore Spiral Hot Water Generator, Sectional View.

THE GLENMORE

Spiral Hot Water Generator.

(PATENTED.)

For General Heating Purposes, but Especially Adapted to House Heating.

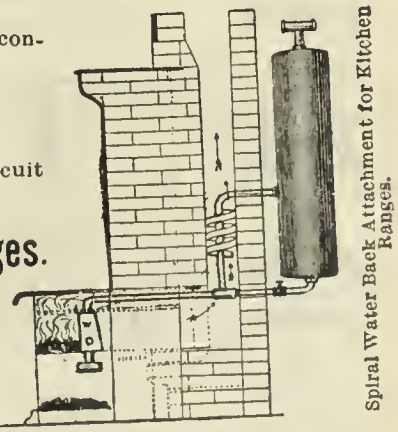
COMMENDATORY POINTS:

Simple construction. Practically composed of two sections, consequently few joints and nothing to give out.
Large heating surfaces.
Products of combustion fully utilized.
Instantaneous generation of hot water.
Free and easy circulation.
Easily cleaned fire surfaces.
Hot water may be drawn off at any point along the pipe circuit without materially affecting the heating service.
Grate conducive to economy in fuel.

Spiral Water Back Attachment for Kitchen Ranges.

By utilizing waste heat, this water back extends the capacity of a kitchen boiler, and makes it a valuable heating auxiliary, especially in spring and fall, when the regular heating apparatus is too powerful.

☞Send for Pamphlet.



Spiral Water Back Attachment for Kitchen Ranges.

GLENMORE FOUNDRY AND MACHINE CO., 73d ST. and WOODLAND AVE. PHILADELPHIA, PA.

SECURE AGENCY EARLY.

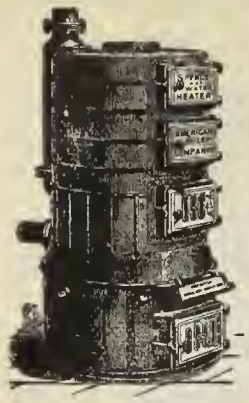
Send for Catalogue without delay.

The Plummer Steam Heater.

12th SEASON, BUT "UP TO DATE."

The Leader Hot Water Heater.

PUTNAM FOUNDRY & MACHINE CORPORATION, - PUTNAM, CONN.



"Spence" Hot Water Heater.

WE EMPLOY nearly 1000 people in our various departments—all of them experts in their respective branches of work.

WE MANUFACTURE 18 styles and 182 sizes of Steam and Hot Water Heaters. They are constructed of the best materials obtainable.

WE SELL to the dealer only! It has always been an inviolable rule of this company not to sell to the consumer!

American Boiler Company

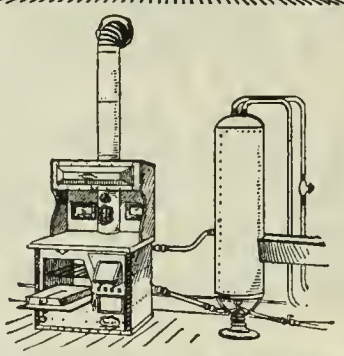
94 Centre St., New York. 84 Lake St., Chicago.

★ STAR WATER BACK AND BOILER ★

COUPLERS.

DONT WIPE YOUR JOINTS — SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

NO SOLDER NO BURST — ANY MECHANIC CAN DO IT

WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

★ Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.
Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada. ★

THATCHER

The Celebrated

"Thatcher"

FURNACE and RANGES.

GAS-TIGHT.
DURABLE.
ECONOMICAL.

Also Manufacturers of the

"CHAMPION"

Steam and Hot-Water Heaters.

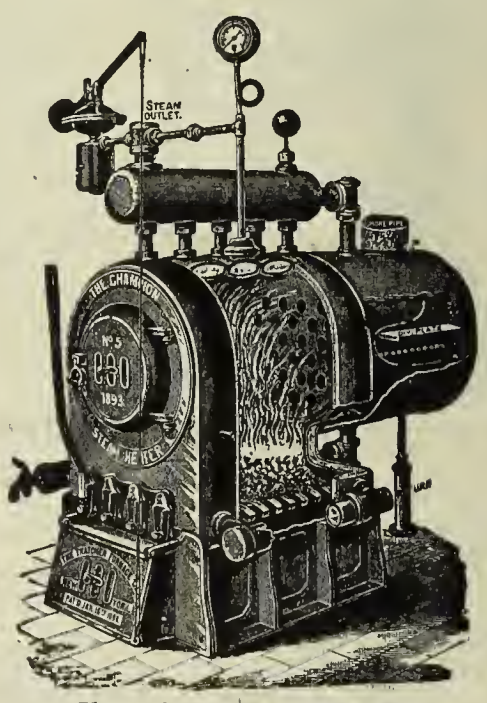
Sold by the trade extensively throughout the country.

Specified by Leading Architects.

Illustrated Catalogue Sent Free.

The Thatcher Furnace Co.,

240 WATER ST., NEW YORK.

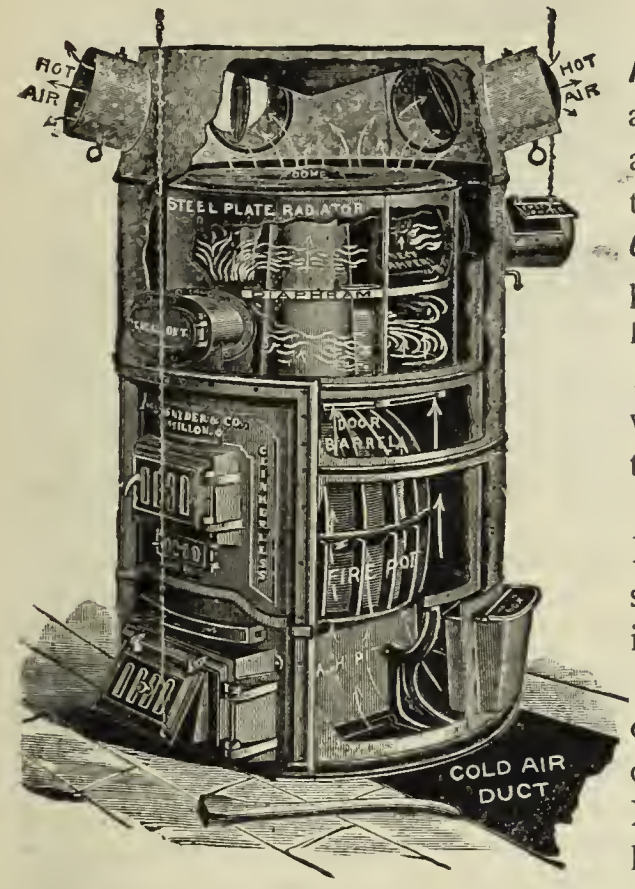


Champion Steam Heater.

Has advantages over any other Heater.

Send for Circular.

A BOOMER and SURE DEATH.



THE BOOMER HOT AIR DRAFT is absolutely correct and will *burn* all the *Smoke* and *Gases*. The draft passes through a heated iron chute 1 in. high, 15 in. wide and 6 in. long to reach the fire.

Double Return Flue Radiator insures *Economy* and is easily cleaned.

Especially adapted for either *Soft* or *Hard Coal*. Makes fully one-half less ashes than any other furnace. All Soot is burned. ***Heaviest, Most Durable*** and ***Economical*** Furnace made. "Don't be a clam," but investigate and learn the ***Real Merits*** of the ***Boomer*** before you order Furnaces.

The No. 16 Novelty Spray Pump

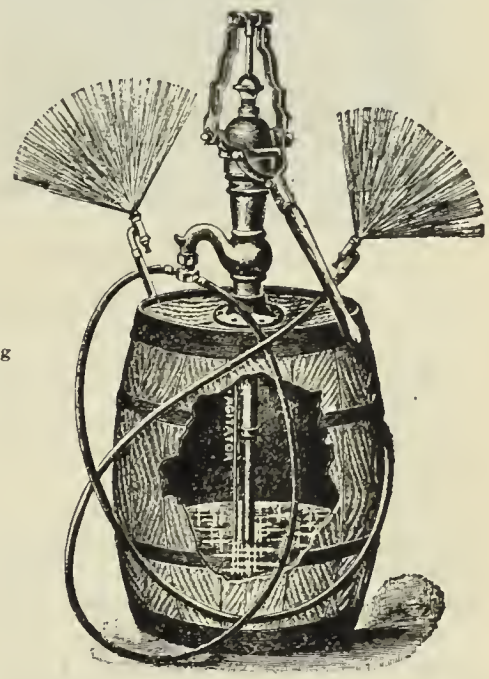
Is a Fatal Enemy to Bugs and Insects.

A perfectly steady stream is obtained, full 6½-inch stroke. Agitator pipe to bottom of tank insures constant stirring up of the solution being used. Life is too short to waste words selling a poor pump.

The Novelty will save you time and trouble and make a good profit for you.

The Only Perfect SPRAY PUMP Made.

Write for Complete Catalogue of its Many Merits and Illustrating Full Line of Other Spray and Well Pumps.



HESS, SNYDER & CO., Sole Makers, 73 ERIE ST., MASSILLON, O.

THAT'S WHAT THEY SAID

"Cold snap? We hadn't noticed it particularly—kept warm enough at our house."

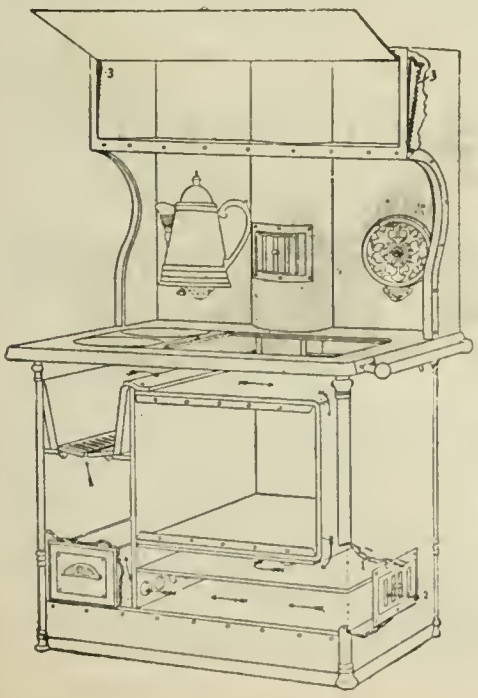
THEY WERE USERS OF THE

"Mowry-Page" Boiler,

This well satisfied lot of people. Many fitters were fortunate enough to have them among their customers—were **YOU?** Our new agency list is open for '95–'96: shall we put your name at the head of it? Experience must have shown you that it pays to please your trade, and we can help you do it.

Better have our catalogue by you anyway—it's a good investment and costs you nothing.

W. C. MOWRY, Lock Box 314, Norwich, Ct.

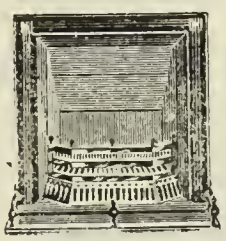


DO YOU wish to ***CONTROL*** the ***SALE*** of a ***STEEL RANGE*** that will save enough fuel to pay the entire interest on the money invested in the Range?

Write at once and get prices on our patented ***DOUBLE FLUE RANGES*** and secure territory.

SUPERIOR STEEL RANGE CO.,

131-137 Viaduct and 35 W. Center,
CLEVELAND, O.



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.



— FATHER: "Why is it that you have no money the day after you receive your salary?"

Son: "It is not my fault, daddy—it is all owing to other people."—*Truth.*

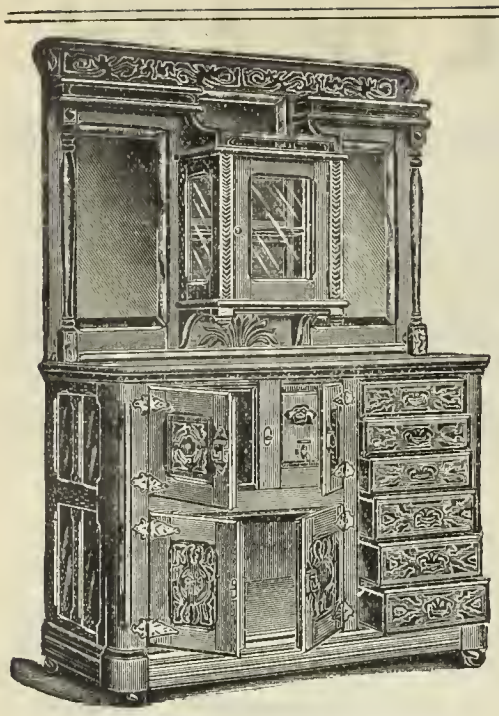
— "DID I understand you to say that Thompson was a farmer?"

"Good gracious, no! I said he made his money in wheat. You never heard of a farmer doing that, did you?"—*Indianapolis Journal.*

— THE appoint ment of Count Schouvaloff to be Governor of the city of Warsaw is in itself a guarantee that the sidewalks of that city will be kept free from snow. —*The Press.*

— SMITHKINS: "Say! Why do you call this a 'dissolution sale?'"

Cohen: "Pecause it vas a deadt give away!"—*Chicago Inter Ocean.*



GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co., Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.
Lee-Clarke-Andreesen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Wm. Miller Range & Furnace Co., Cincinnati, O.
Doggett Dry Goods Co., Kansas City, Mo.

BUY THE BEST.

—THE—

Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,

GRAND HAVEN, MICH., U. S. A.

Write for our large Illustrated Catalogue for 1895.

All our goods are made of thoroughly kiln dried ash, finished in antique with Shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups All Refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

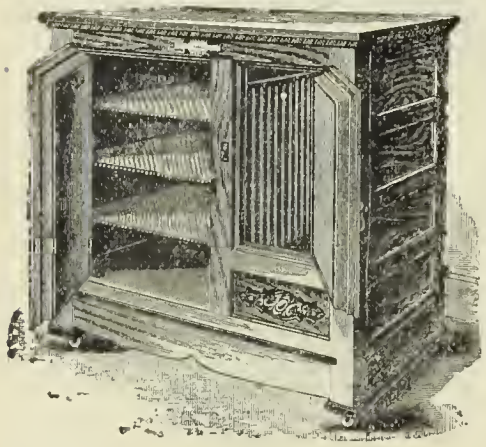
THE CHALLENGE ICEBERG,

THE .·. HONEST .·. RELIABLE .·. REFRIGERATORS.

SELL THE BEST.

The Automatic Refrigerator

has more good points and does better work than any other and for that reason is a better seller.
Our illustrated catalogue for 1895 tells all about the line. Its advantages are:



Perfect circulation.
Large condensing and purifying capacity.
It has no flues to cause it to smell bad.
The trap is inside where it cannot be misplaced or lost.
The drip pipe may be cleaned without disturbing anything in either chamber, and is entirely out of the way.
It has nine walls to protect the ice and to maintain a uniform temperature in the cooling chamber.
It has woven wire provision shelves that are superior.
It has superior hardware.
It is more capacious and convenient.
Flavors of foods will not mix.
Last but not least, it's different, and will bring new customers and new trade.

We want the leading dealers to sell our goods and but one dealer in a place.
The goods are made of ash, and well finished.
We have two factories, one in the East and one in the West, and are able to take better care of your trade than if we had but one.

For catalogue and discount address:

Illinois Refrigerator Co,
909 Masonic Temple,
Chicago.
If West of Chicago.

Columbia Refrigerator Co.,
Northville,
Wayne Co., Mich.
If East of Chicago.

THE SHIRK REFRIGERATOR CO.,

CORK FILLED.

Manufacturers of

REFRIGERATORS

FOR

Families,
Hotels,
Restaurants
AND
Apartment Houses.

THE SHIRK REFRIGERATOR CO. TRADE MARK

Builders of

Cold Storage Houses

AND

COOLING ROOMS

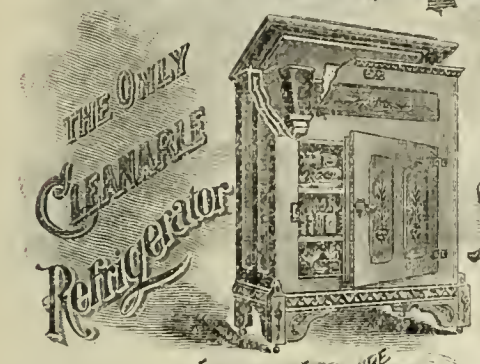
Of Every Description.

273 WABASH AVENUE,
CHICAGO.

Branches { 30 Warren Street, NEW YORK. / 905 Market Street, PHILADELPHIA.

WE SELL THE GURNEY PATENT REFRIGERATOR





WILL SHOW THE LOWEST AVERAGE TEMPERATURE WITH THE LEAST CONSUMPTION OF ICE

MANUFACTURED BY
GURNEY REFRIGERATOR CO.
FOND DU LAC, WIS. U.S.A.

Distributing Agencies for 1895

The S. M Howes Company, Boston, Mass.
Supplee Hardware Co., Philadelphia, Pa.
Bindley Hardware Co., Pittsburgh, Pa.
Frank Diel, Syracuse, N. Y.
McIntosh-Huntington Co., Cleveland, O.
Indianapolis Stove Co., Indianapolis, Ind.
Chicago Stove & Range Co., Chicago.
Freeman Delamater & Co., Detroit, Mich.
Robert Seeger, St. Paul, Minn.
A. J. Lindemann & Hoverson Co., Milwaukee, Wis.
King Hardware Co., Atlanta, Ga.
O. K. Stove & Range Co., Louisville, Ky.
Heckel Hardware Co., St. Louis, Mo.
Howard W. Peak, Fort Worth, Texas.
Richards & Conover Hardware Co., Kansas City, Mo.
Tolerton & Stetson Co., Sioux City, Iowa.
Rector & Wilhelmy Co., Omaha, Neb.
McDonald & Willson, Toronto, Ont.

New York Office: 105 & 107 Hudson St., } LLEWELLYN BONHAM, Agt.

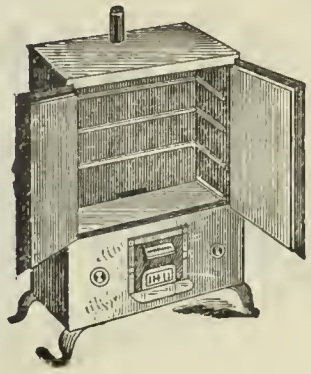
A dealer wanted in every town and city in United States and Canada.

Write for catalogue, terms and discounts, and secure the agency.

Apply to nearest agency or address Home Office,

Gurney Refrigerator Co.
Fond du Lac, Wis.

BLODGETT'S PATENT PORTABLE
OVEN
—FOR—

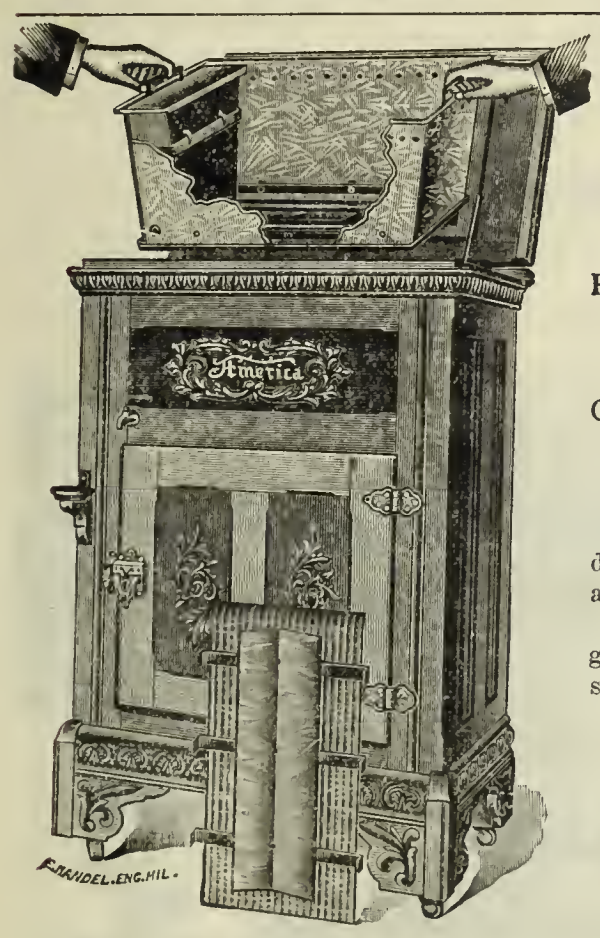


Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY
Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.
Burlington, Vt.



The America!
GEM OF
REFRIGERATORS.

Patented Removable Ice Compartment.

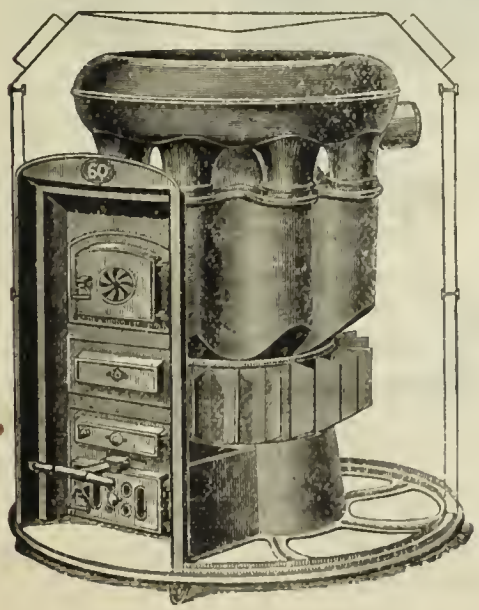
Can be kept clean with the least trouble.

Its construction for cleanliness, drainage of waste water, circulation and insulation is perfect.

Write for catalogue and investigate our claims. It will pay you to secure the agency in your town.

THE
Bowen Manufacturing Co.,
FOND DU LAC, WIS.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American
REFRIGERATORS
GUARANTEED TO BE
THE BEST IN THE WORLD!
OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,
At LOWEST PRICES EVER KNOWN.
If your dealer does not have them, Send for Illustrated Circular and Price-List, to
JOS. W. WAYNE,
MANUFACTURER,
124 MAIN STREET, CINCINNATI, O.



CORY'S
ALL CAST IRON
GAS-TIGHT FURNACES.

The purchaser will never ask if this is the *best* quality made, as all dealers understand the "Cory Furnace" to be only of *cast iron*, without bolted joints; gas-tight and durable. Quality exactly the same in twenty sizes from $35 to $125.

UZAL CORY & CO.,
210 Water St., New York.
Established 1847.



Warm-Air Registers, Ventilators Etc.
Hardware Specialties.

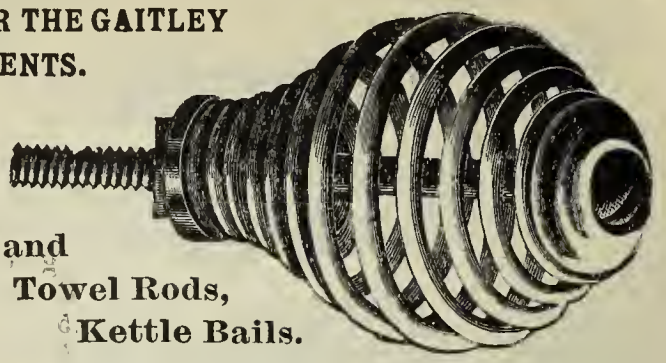
BUFFALO REGISTER WORKS,
430 and 436 Niagara Street. - Buffalo, N. Y.

NEW HAMPSHIRE
MICA
IS THE BEST.

The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.



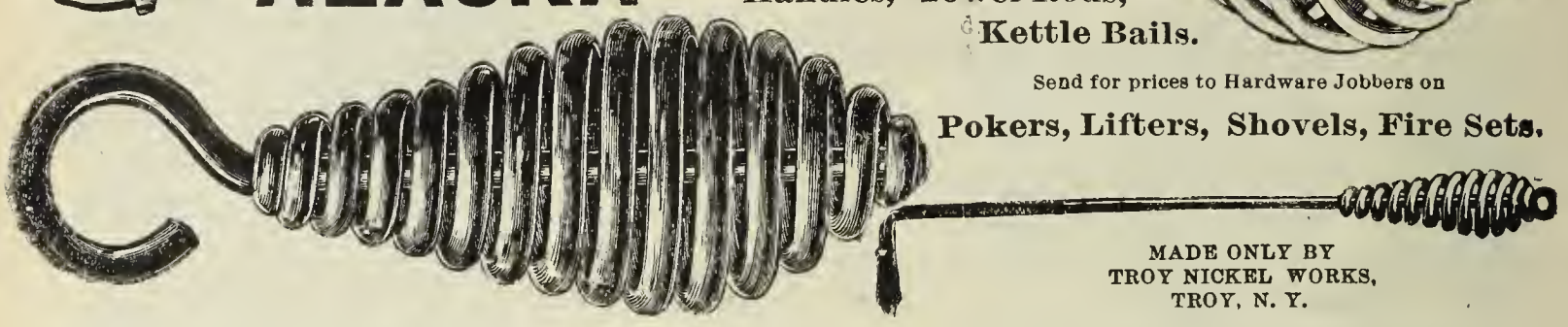
MADE UNDER THE GAITLEY PATENTS.



ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.

Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.



MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

BLUE BOOK
FOR THE
REGISTER TRADE.

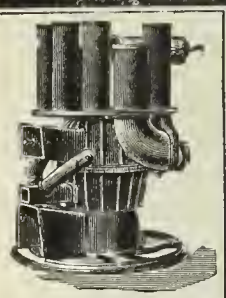
A UNIQUE PUBLICATION FOR FREE DISTRIBUTION.

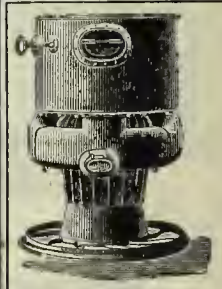
IF INTERESTED IN WARM AIR REGISTERS,
PLEASE WRITE FOR COPY TO

The Ferrosteel Company,
Wade Building,
Cleveland, - Ohio.

OXFORD PERFECT BLAST FURNACES.

CONSTRUCTED WITH A POSITIVE WORKING AIR BLAST AND UTILIZING INDIRECT CURRENTS. TO INCREASE HEATING CAPACITY.





THE J. H. McLAIN COMPANY.
CANTON, O.

NEW YORK. 69 CENTRE ST. | CHICAGO. 58 DEARBORN ST. | DENVER. 1525 CHAMPA ST. | SAN FRANCISCO. 5 CROCKER BLD'G.

MICA
NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

M I C A

MICA OF ALL GRADES
—FOR—
STOVES and Mechanical Purposes.
PALERMO MICA CO.,
Miners and Importers and Wholesale Dealers,
S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Prop.,
88 Fulton St. N. Y.

— HOBBS: "How is your furnace working this winter?"

Pitt: "Like the mischief on warm days."—*Chicago Inter Ocean.*

—THE IRON AGE—

HARDWARE PRICE BOOKS.

Arranged by R. R. WILLIAMS, Hardware Editor of The Iron Age.

THESE BOOKS are printed on paper of superior quality and bound in grain seal leather. They are all indexed through, care being taken to give each letter the proper amount of space for the accommodation of Hardware articles. Books A, B and C are issued in four editions: With 200 pages, price, $1.00; same with flap, $1.25; with 400 pages, $1.50; same with flap, $1.75. In the same manner book D has four editions, price, respectively, $2.00, $2.50, $3.00 and $3.50. Book E has but the one edition, priced at $5.00.

BOOK A.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices the regular and any special price or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact. Size, 4 x 7 in.; grain seal leather.

BOOK B.

This book contains headings and spacings for article, No. or size, list, discount, net cost, regular, special. Each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations sufficiently large for the convenient and concise record of prices. Size, 4 x 7 in.; grain seal leather

BOOK C.

The headings in book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price and also for any remarks in regard to cost of the goods, desirability of pushing them or other matters. Size 4½ x 7¾ in.; grain seal leather.

BOOK D.

Price Book D measures 5¼ x 8 inches, and will recommend itself particularly for desk and store use, and for salesmen on the road. It is strongly bound, and with a fine quality of heavy ledger paper, admitting of erasures and changes, and pages are numbered. The headings are conveniently arranged as follows:

Article. Number or Size. Regular Selling Price. Special Selling Price. Purchased from. Date of Quotation, Purchase or Invoice. List Price. Discount Net Cost. Weight. Freight. Total Cost.

BOOK E.

This is a large book, measuring 7 x 10 inches, and contains 280 pages. The binding is strong and the paper of the best heavy uality. Each page is complete with the following headings properly spaced:

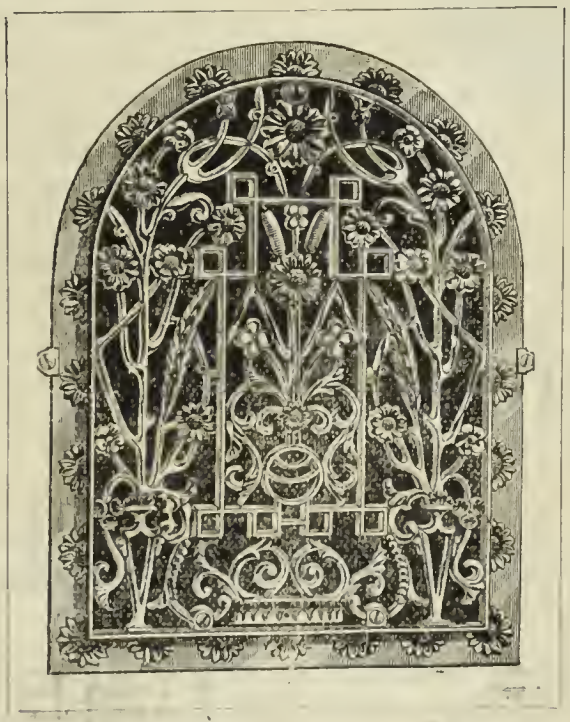
Article. No. or Size. List. Discount. Add. Cost. Sell. Mem.

The special feature is the multiple system of indexing employed by means of three parallel marginal rows, which run through the entire book. Each index tab gives the first two or three letters of hardware articles, enabling the user to refer at a single motion to any goods. Special care has been taken to make the index classification correct and to provide sufficient space for recording of prices. Forty pages are reserved for supplemental quotations, memoranda, tables, &c.

Sent, postpaid, on receipt of price by DAVID WILLIAMS, Publisher, 96-102 Reade St., New York.

TUTTLE & BAILEY MFG. CO.,

REGISTERS, VENTILATORS, &c.



REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.

THE WILLIAMS PRINTING CO.,

Commercial Printers AND Binders.

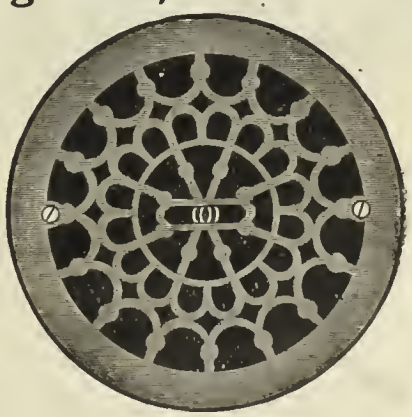
ESTIMATES FURNISHED FOR ALL CLASSES OF WORK

96, 98, 100 and 102 READE STREET, - NEW YORK.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers, Ventilators.



HUB PATTERN.

BOSTON, - - MASS.

—AND—

NASHUA, - - - N. H.

— THE PROCESS DESCRIBED.—Raggsy: "How do you s'pose they make Limburger cheese?"

Swipesey: "They make it 'bout like they do any other kind, an' then they put it away an' let it die."—*Chicago Tribune.*

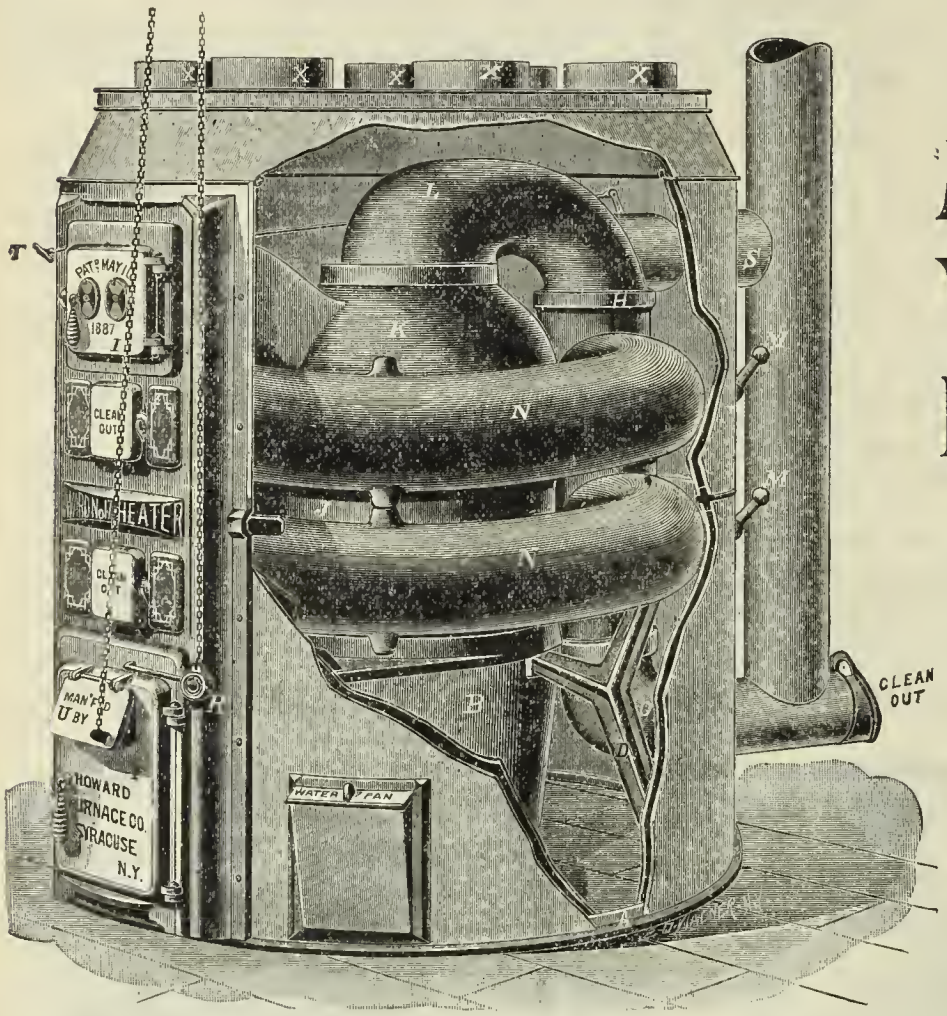
— DUBIOUS.—Mrs. Newed (returning from an absence of two weeks): "Are you really sad when I am away, Ferdinand?"

Mr. Newed (who means every word of it): "Mathilda, I never really appreciated what married life was until you had left me."—*Chicago Record.*

— JUDGE: "Were you ever up before this court?"

Everett Wrest: "Can't say, judge. What time do your honor git up?"—*Cincinnati Enquirer.*

HOWARD FURNACES



Men Who Like

to see good work done on a Warm Air Furnace appreciate the fine points which the

HOWARD HEATERS

embody as a model to work from. When cased they only stand 44 to 66 inches high, according to size, and the advantages derived by being so low are worth due consideration.

SUPPOSE

you try one of these heaters. They embrace qualifications and merits of original character which enhance their value and make them rank high in the estimation of the trade as being above the ordinary class of heating apparatus.

HOWARD FURNACE COMPANY.

MAIN OFFICE AND WORKS, SYRACUSE, N. Y.

—BRANCHES.—

New York, 210 Water St. Boston, 61 & 63 Blackstone St. Grand Rapids, 38 S. Division St. Toronto, 337 Yonge St

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 19, 1895.

DAVID WILLIAMS - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 11.
Index to Reading Matter.....Page 62.

Cold Weather Casualties.

During the spell of severe cold last month a number of accidents in heating systems were reported. Some were of a serious character, doing considerable damage. In one case a radiator was taken from a hot water system and caps put on the ends of both the flow and return mains, stopping the circution through this portion of the system, which, being the larger portion of the system, interfered with the circulation and resulted in an explosion which caused considerable damage. It is not an unusual thing in house heating systems for the fire to be neglected to the extent that its effect is practically nullified, and in such weather as was experienced in February there seems to be little to prevent a system freezing up, which was the experience in a number of cases. In some cases the pipes were split and parts of the residence flooded, with the attending damage. In other cases the ice stopped the circulation in a hot water system and the return of condensation in steam system, but fortunately they were discovered in time to prevent serious accident, which would have resulted from kindling a fire.

Natural Gas in Foundry Cupolas.

The foundry trade is considerably agitated over the reports which have appeared almost simultaneously regarding the perfecting of new processes in producing ordinary castings and malleables. From Anderson, Ind., comes the statement that at last a method has been discovered for the successful use of natural gas or oil in melting pig iron and making ordinary castings. At Muncie, in the same State, malleable castings are also claimed to have been successfully made in a furnace operated on natural gas. Springfield, Ohio, comes to the front with another discovery by which it is asserted that malleable castings can be made as easily as ordinary castings, avoiding the time-honored practice of annealing, which requires several days, although the period has been greatly shortened within the past few years. All these processes are extremely valuable if on more general trial the claims of the inventors shall be fully sustained. The use of natural gas for melting pig iron in foundry cupolas would be confined within a comparatively limited area, but would be of much importance to foundrymen within that area. The use of oil would be of much wider application. Further developments in the several directions indicated will be awaited with much interest.

Reckless Building.

A deplorable instance of unscrupulous greed and reckless disregard of human life on the part of certain builders and contractors, combined with criminal negligence on the part of the officials intrusted with the authorization and inspection of new buildings, has recently occurred in New York City. A group of tenement houses in course of erection suddenly collapsed, burying five men in the ruins. Examination of the demolished structure revealed the fact that, in nearly every detail of their construction, the building laws had been outrageously violated. The mortar used was composed of a small proportion of sand, dug from the cellar and mixed with loam. Moreover, it had been applied when the temperature was below the freezing point. When the thaw came it melted into mud, consequently the building collapsed like a house of cards. Still further, crumbling stone was used for the foundation, and old bricks and beams, from the demolished building which formerly occupied the ground, had been used in the new structure. Party walls had no foundations at all. In every respect a more elaborately planned death trap could hardly have been designed. Responsibility for the disaster, according to the verdict of a coroner's jury of experts, is shared by several individuals, including the owner, architect, builder and the inspectors of the Building Department. All the guilty parties will, it is announced, be held to a strict accountability for this crime, and it is hoped that exemplary punishments will be meted out. The statement of a well-known New York builder, that he can point out other tenement houses in the city which have recently been run up with the approval of the Building Department under similar disgraceful conditions, is not calculated to promote confidence in the trustworthiness of that city department, one of whose officials admitted at the inquest that he was in the habit of marking plans for new buildings "O K" without examining them. The trouble is that, along with the other municipal departments, it has for a long time been run by men chosen for their political "pull," rather than for practical knowledge of their profession.

A remarkable revival of activity has been apparent in building circles in New York City during the past few weeks, as shown by the statistics published by the Building Department. The outlook for the industry during the coming spring promises very well. Real estate men report that unusually large amounts of capital are coming into the market for investment in new buildings, a marked feature of the situation being the projection of plans for important structures to take the place of old fashioned buildings in the district between Canal and Fourteenth streets. A table, published by the *Record and Guide*, exhibits the remarkable improvement which has occurred both in the number and in the value of the buildings planned so far this year, as compared with the same period of last year. To the end of the first week in March, 707 buildings, estimated in value at $17,665,359, were planned, as against 368 buildings, valued at $6,812,233, in the first 11 weeks of last year.

Superintendent Preston of the New York State Banking Department, in his annual report for last year on the savings banks, trust and safe deposit companies in the State, makes a very favorable showing for these institutions in spite of the prevalent and continued uncertainty in financial circles and the general business depression which compelled larger withdrawals of savings than would have been the case had the situation been more prosperous. On January 1 there were in the State, under the supervision of the department, 125 savings banks, 38 trust companies and 18 safe deposit companies, with combined resources of $1,391,297,-648.36. This shows an increase of $68,775,927.59 over the same date for 1894, when there were 125 savings banks, 36 trust companies and 17 safe deposit companies. The deposits in the 125 savings banks of the State, as shown by their January reports, were $643,873,574 44, an increase for the year of $26,784,125.46. No savings banks were closed during the year.

The New York *Journal of Commerce* published this week a special report, carefully prepared, of the present condition and the prospect of business in some 17 of the leading trades of the Eastern section, which affords gratifying evidence that business in this section is returning to normal conditions and that a good and healthy spring trade may be expected.

THE LETTER BOX.

Ventilating a Barn.

From J. A., *Vermont.*—Some time ago I received an order to put an 8-inch ventilator into a barn, the space to be ventilated being 20 by 27 feet, 8 feet high, and the basement of the same size. There is an opening 2½ inches wide and 10 feet long under the basement door which is to furnish fresh air. I ran the pipe direct from the basement through the floors and roof and carried it about 8 feet higher than the ridge. I put two 8-inch square holes in it in the stable part, one near the floor and one near the ceiling, and provided them with sliding doors to regulate the draft. The ventilator, however, does not work and my opinion is that the pipe is too small. There are six horses and a cow kept in the stable and pigs in the basement. The pipe is placed at one end of the stable floor. Would it be possible to get as good results in ventilating both rooms with one pipe as with the use of separate pipes, and if so, what size pipe would it be advisable to use? Would it make any difference whether the pipe went up in the center of the room or at one end? I will be glad to have the opinion of the readers on this subject.

Steam Diaphragm.

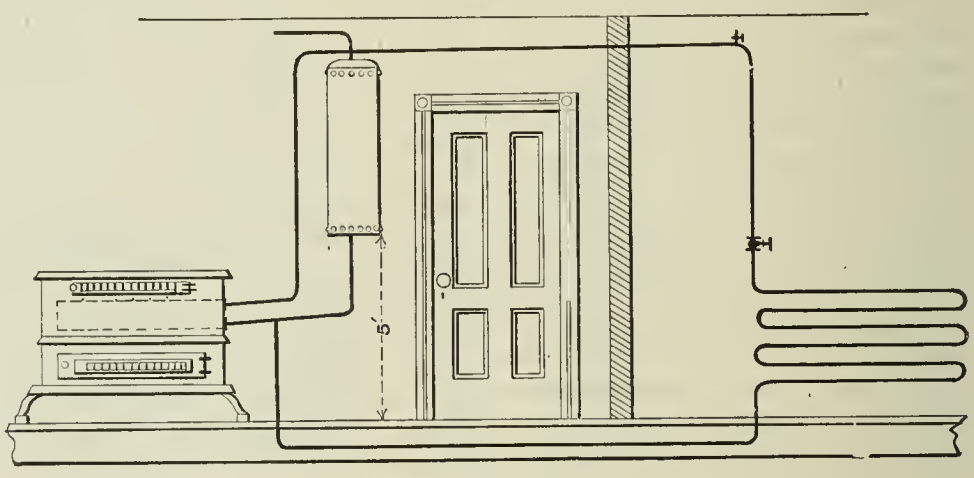
From W. R., *Cold Springs, N. Y.*—Please describe through the Letter Box the construction and uses of a diaphragm as used on steam heating plants.

Note.—The diaphragm most frequently used on steam plants is in connection with draft regulators. In some cases they are made of sheet metal and in others of leather, but more generally they are made of the same composition of rubber. They are placed in a chamber with a space on both sides, one side having an opening for the admission of steam from the boiler. On the other side is a piston to which is attached levers which connect with the check draft and the ash pit draft. When the pressure of steam distends the diaphragm one end of the lever is lowered and the draft at the ash pit is closed and that at the smoke pipe opened. When the pressure of steam falls below a certain degree the opposite operation results.

Will It Circulate?

From F. T. M., *Steelton, Pa.*—I have read the letter "Will It Circulate?" in *The Metal Worker* of February 26, and I desire to ask a question on a similar subject. I want to heat my dining room with hot water from the kitchen boiler or with the boiler itself, and there is a door between the two rooms which interferes with running the pipes on the proper incline. I have made two sketches, which I inclose. In one I put the boiler near the stove and in the other the boiler is put in the dining room and the pipe run over the door to it and to the radiator, then the return is run under the floor back to the boiler in the dining room. I would like to know which will work best. I see in "Kitchen Boiler Connections" that in some cases the return is allowed to dip lower than the water back, but do not know to what extent it may be dipped with success.

Answer.—We have reproduced but one of the illustrations sent by the correspondent, as it shows the arrangement that will be satisfactory. If the boiler was placed in the dining room an objectionable heat wou'd be furnished during the summer season. If the brass connection is taken out of the top of the boiler and a galvanized iron pipe of the full size run up to a point above the top of the door and a cross put on it at this point, the difficulty of passing the door may be overcome.



Will It Circulate?

From the top of the cross the hot water service pipe to the house fixtures may be run. From the side of the cross, with a fall from it to the radiator, a ¾-inch pipe may be run, and owing to the fall the air cock will not be necessary, as the air in the radiator will pass up to the house service and escape at the faucets. A valve on this pipe may be placed either at the radiator or at a more convenient point to prevent circulation in the summer season. The return from the radiator may be dropped below the floor and carried over to the water back and connected at the water back rather than at the bottom of the boiler. If this pipe passes through a cold cellar it would be well to insulate it. In making a connection at the water back the same plan should be fol lowed as at the top of the boiler, except that a tee should be used. At the lowest point on this pipe a stop cock should be placed, so that in case it is desired to drain the entire system at any time it may be done and no water left in this pipe to freeze and burst the pipe.

Pipes Burst by Freezing.

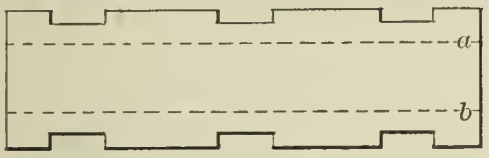
From XENOPHON, *Tarrytown, N. Y.*—If freezing water exerts a pressure of 30,000 pounds per square inch, why is it that all pipes which freeze do not burst?

Answer.—The manner of freezing in pipes, as well as their elasticity, controls the amount of overpressure that causes them to burst during the freezing process. Water is at its greatest density at 39° F. Its density decreases slightly in falling to a temperature of 32° F., which causes its bulk to increase. When frozen its specific gravity is 0.922, 0.998 being the specific gravity of water at 32° F. Its bulk increasing in proportion to the specific gravities as water and ice, it expands 0.08553 its volume in freezing, while its compressibility being but a minute portion, its pressure becomes enormous when confined in iron, which contracts under the increasing cold and accounts for the bursting of the strongest shells or the flowing of solid ice out of a hole in a shell that is strong enough to produce a solid flow. The circumstances controlling the stability or bursting of pipes by freezing may be found principally in the interlocking of a portion of water between two points at a little distance apart by the pipe freezing solid at these points first, and as the freezing process crawls along the pipe with solid plugs behind it, the water of the central section by cooling comes under enormous pressure. On the contrary, when the freezing takes place slowly and uniformly along an exposed pipe, the ice is formed on the inner surface, growing gradually toward the center, and undue pressure is prevented by the water flowing away through the central opening, and when finally the center is closed uniformly along the section frozen the pressure is not increased by the continued fall in temperature, because as soon as it be-

comes solid its bulk decreases with increasing cold. The bursting power of confined water by cooling from 39° to 32° F. is beautifully illustrated by filling a bottle full with water at 39°, corking it tight and laying it on a cake of ice; it will generally burst before the water begins to freeze. The freezing of a drinking tumbler is an interesting experiment, illustrating both phases of this phenomenon. A tumbler full of water, if frozen from the bottom upward, seldom breaks. If frozen from the top down it seldom escapes fracture.

How to Bind "The Metal Worker."

From OLIVER TWIST —The advantages that are to be gained by having the weekly numbers of *The Metal Worker* all gathered together by means of some suitable binding cannot be overestimated, and it is fully appreciated by those who, when they wish to refer back for information about some particular thing they remembered seeing, long ago perhaps, and which would apply to the job on hand, would have to search through a pile of *Metal Workers* three feet high, which had been thoroughly mixed by previous searches. The following method will fill a need that has long existed among the tinners in coun-



How to Bind "The Metal Worker."

try towns, where it is next to impossible to get a book bound at all, and to say the least would be very expensive. The first thing to do is to take out the steel binders so as to allow the advertisements to be separated from the reading matter that we wish to save for future reference. This is composed of that part laying between Editorial Notes and Contents inclusive. If you take the trouble to take the square shears now, you may trim the papers all to one size, which will give them a better appearance when finished. Take two wire nails about 2 inches long and solder a copper burr to the head of each one. Gather up the papers in rotation according to date from January to June inclusive, and drive these nails at a point 4½ inches from each end and ½ inch in from the back edge right through the whole bundle. Now cut off the points that project through, and solder on burrs to correspond with the opposite side. Measure the thickness of the volume, and cut out a piece of tin like the cut, leaving 1 inch outside the lines *a* and *b*. Cut out three notches, as shown, each 2 inches long, which will form hinges for the covers to turn on, and wire with No. 12 wire. Bend at right angles on the lines *a b*, which represent the thickness of the volume. Put this on the back of the book, and 2 inches from each end drive a nail through and solder on a burr as before, only having the burrs outside the metal cover this time. This will securely fasten the cover to the book. All that remains to do now is to cut out two pieces for the back and front of cover. Fold them on four sides and solder on to the hinges, and you will have a volume which has cost you about ten cents for material and is neat in appearance and very useful. You can obtain from *The Metal Worker* office an index for each volume, which will make it easy for reference.

Water Hammer in Pipes.

From G. A. L., *Manchester, Vt.*— What effect will the closing of a fire hydrant quickly have on the plumbing fixtures in a house when the water supply is taken from the main and the range boiler has no relief valve? Would it not cause the boiler to leak or some of the other fixtures to burst, the water pressure being from 100 to 125 pounds? If any readers of *The Metal Worker* have had trouble of this sort I shall be glad to hear from them

From G. J. M., *Oshkosh, Wis.*—I have done a job of plumbing in a house where the authorities required the use of self-closing work. Now, when they draw water at the sink and let go of the faucet it pounds over all the house. Another trouble is that the ball cocks drop and splash the water out of the flush tanks. There are no air chambers in any part of the house and we cannot very well put them on the closet supply, neither would it be convenient to place them at the sink. Would it remedy the trouble if the air chamber was put in the cellar, or what would be the best thing to do under the circumstances? Please tell me what would make the best air chamber, what size to use and all about it.

Automatic Damper Regulator.

From M. F. I., *Canada.*—Will any of the readers of *The Metal Worker* inform me if there is any automatic device for regulating hot air dampers from the ground floor? If so, where is the device made?

High Pressure Water Heating.

From C. C. S., *Woodbury, N. J.*— Please inform me what is meant by high pressure water heating and what is meant by low pressure hot water heating.

Answer.—On all hot water heating systems an expansion tank is located at some point to receive the excess of water in the heating plant due to expansion when it is heated. In low pressure heating this expansion tank is open to the atmosphere, and no attempt is made to confine the water under pressure. In high pressure heating the expansion tank is hermetically sealed, leaving a space equal to one-twelfth of the bulk of water in the system for air in the tank above the water line in the system when the water is cold. When the water expands the air acts as a cushion and the pressure is proportional to the amount of space left in the air chamber, a small air space resulting in a high pressure and the pressure being reduced as the air space is enlarged. On such system a safety valve is always placed on the expansion tank at the top of the air chamber to permit the escape of air or water after the pressure has reached a given point. Some experience and skill is required in adjusting the pressure hot water heating system correctly, and the use of such systems is very small compared to what is known as open tank or low pressure system. In case of the safety valve being weighted too heavily or becoming stuck to the seat, higher pressure is liable to be developed in the system than was intended, and in some cases the system has burst with considerable force and damage. On the liberation of water heated to a temperature considerably above 212°, owing to the pressure the water immediately turns into steam. Experienced men prefer the open tank or low pressure heating.

Radiating and Heating Surfaces.

From F. F. G., *Belvidere, Ill.*—How many square feet of radiating surface will 1 square foot of heating surface supply?

Answer.—The following extract from Baldwin's "Steam Heating for Buildings" indicates the difficulty of answering the question exactly: "There is no simple relation between the heating surfaces of boilers and the radiating surfaces of the buildings they have to supply the steam to, for the following considerations apply to every type of boiler: The method of setting, what the grate surface is, the character of the work they are designed for, and whether the air is simply to be maintained at a certain temperature, as in direct radiation, or whether every cubic foot of air which comes in contact with the radiator must be warmed from the outside temperature, as in indirect radiation, or whether the apparatus is direct-indirect or composite, all of which would have to be considered, and the results would then only be approximate; for even then, neglect of cleaning, a certain amount of neglect of management, and the state of the fire—whether on the first hour of the new fire, or the last hour of the dirty fire, for the time they are to run, must enter into this calculation.

"If the effect of the cooling produced by loss through the glass and walls of a building can be estimated and added to the amount of heat lost in warming the air admitted for ventilation, a close estimate can be made of the smallest grate which would burn fuel enough to evaporate the amount of water in a boiler sufficiently large; but the following points the constructor must never lose sight of in estimating for an automatically fitted boiler—namely, that it is the amount of opening in the draft door which regulates the fuel burned; next, the fuel burned regulates the water evaporated; and, finally, the water evaporated regulates the heat—both the heat of the room (by having a sufficiently large heater) and the heat (or pressure) necessary to move the diaphragm—which regulates the draft, so that really what is required are certain limits within which he knows he is

safe and to exceed which would be an unnecessary expense.

"Boilers for very large buildings, which have an engineer in charge, may be figured pretty closely; as he is supposed to be constantly at his post, and to clean his boiler fires regularly; and to fire often, and in small quantities, keeping his fire door open the shortest time possible, and further, to clean the tubes or flues whenever required. But this is not the case in house boilers. They must run for long periods without cleaning or inspection, and be adequate to every contingency of change within their limit of time to keep steam. It has been found by experiment in a general way, and from practice, that for ordinary buildings with average window surface and for the greatest range of temperature in our Northern States, when nothing but direct radiation with no ventilation is used, 1 square foot of boiler surface to 10 square feet of radiating surface will answer; assuming the radiating surface is ample. For indirect radiation, if the heating or radiating surfaces of the coils are figured double what they would be for direct radiation without ventilation, the same proportion of boiler to coil will suffice; but if, instead of doubling, the same surface be used or a slight increase, as one-fourth or one-third, and the building be kept warm by moving the air faster through a small coil, we must proportion the boiler the same as if we did double—that is, allow 1 square foot of boiler surface to 5 square feet of coil surface, the same as figured for direct radiation, bearing in mind, a boiler is proportioned to the cooling which goes on—heating, ventilating, &c.—and not to the coil surface, unless the coil surface is known to be ample for the conditions of temperature, &c.

"When the air is forced (as with a fan) more heat can be taken from a coil in the same time than when the air moves naturally from a difference in temperature, but as the heat necessary for the building remains the same the boiler must be proportioned to the building, and when the proper coil surface has been found sufficient to maintain the heat for the range in temperature incidental to the climate and local conditions, it establishes the simplest data from which to calculate the boiler. For direct-indirect radiation, proportion the boiler one and one-half times greater than it would be for direct radiation. These estimates are for boilers with ordinary high combustion, such as horizontal boilers, which are kept clean without interruption, but for house boilers (wrought iron shell), with slower combustion, an addition of from one-eighth to one-fourth may be used, and in small water tube boilers (pipe boilers) one-fourth to one-half may be added, in the judgment of the fitter."

The following extract is from Hood, on "Warming Buildings by Hot Water:" "It is obvious that the extent of surface which a boiler ought to expose to the fire should be proportional to the quantity of pipe that is required to be heated by it, and it is not difficult to estimate these relative proportions with sufficient accuracy, notwithstanding the various circumstances which modify the effect. It has been proved by experiments that 4 square feet of surface of an iron boiler will evaporate 1 cubic foot of water per hour, when exposed to the direct action of a tolerably strong fire. This, however, requires free exposure to the radiant heat of the fire; for the heat communicated to the flue surfaces is only equal to one-third of that which is derived by the direct action of the fire acting upon the bottom or sides of the boiler. And it can be ascertained by calculation that the same extent of heating surface which will evaporate 1 cubic foot of water per hour from the mean temperature of 52°, will be sufficient to supply the requisite heat to 232 feet of pipe 4 inches in diameter when the temperature of this pipe is to be kept at 140° above that of the surrounding air. From this, then, it appears that 1 square foot of boiler surface exposed to the direct action of the fire, or 3 square feet of flue surface, will be sufficient in a hot water apparatus to supply the necessary heat to about 58 superficial feet of pipe, or in round numbers, the proportion may be stated as 1 foot of boiler to 50 feet of pipe. As this, however, is almost the maximum quantity of pipe which can be heated, or, in other words, the maximum effect which can be produced without mechanical means of producing draft, it is very desirable in all cases to allow an increased surface of the boiler, bearing in mind that not only will economy of fuel be thereby produced, but the apparatus will be much easier managed and thus become more effectual and certain in operation.

"A small apparatus ought always to have more surface of boiler, in proportion to the length of pipe, than a larger one; as the fire is less intense, and burns to less advantage in a small than in a larger furnace. The effect also depends greatly upon the quality of the coal, the hight of the chimney, the rapidity of draft, the construction of the furnace, and many other particulars; and it will always be found more economical, as regards the consumption of fuel, to work with a larger surface of boiler at a moderate heat, than to keep the boiler at its maximum temperature. A useful formula for calculating the effect of boilers and furnaces in most common cases is as follows: One square foot of boiler surface exposed to the direct action of the fire will boil 11 gallons of water from 52° to 212° F. per hour; or, in other words, it will add 160° of heat to 11 gallons of water. Or the same surface will evaporate 1½ gallons of water per hour. The area of the furnace bars should be about one-sixth that of the boiler surface."

Question of Gas Pressure.

From G. W. FERRIS, *South Manchester, Conn.*—In *The Metal Worker* of February 2 I notice the item from "G. E. S.," Pennsylvania, complaining of trouble with gas pipe in cold weather. The same trouble was experienced here with a 6-inch pipe which crossed a bridge about 6 feet below the line of the bridge floor. In very cold weather the pressure was greatly diminished, so much so that my gas stove in the shop would not work properly. This year the company have covered the pipe and I think they use a cow hair composition, and notwithstanding the recent severe weather we have had no trouble this year.

Inside Cold Air Duct.

From SPEC., *Spencer, Ill.*—B. Reese, Odessa, seems to be a good writer on tinner's matters, and the writer would like him to give his experience on the use of inside air ducts—I mean taking air from the halls to supply a furnace with cold air. Should the inside cold air duct be equal to the area of the heating pipes, or should the accustomed three-fourths of the outlet be used for the supply pipe in such cases? Does it make any difference whether the air duct is run down close alongside of the furnace or should it be run underground a considerable distance before reaching the furnace? In a word, what is the best known plan to follow in using a cold air supply from hall?

What Is a Vacuum?

From P. J. R., *Connecticut.*—Noticing the very many valuable explanations you have given in the Letter Box, I would like to have you help me by giving an explanation of the word "vacuum." I know that siphonage results from a vacuum or partial vacuum being formed in the waste pipe beyond the trap, and that every time a fixture is emptied there is a certain amount of air displaced which must find its way out of the pipe through either the vent or, if not vented, through the weak seal of the other traps on the line, and I have noticed that on a long line of waste pipe there seems to be a strong suction after a fixture has been emptied which will cause the water to be drawn out of the trap when not relieved by a vent pipe, but still I am not able to explain what a vacuum is. I have an idea of what it is, but do not know how to express myself. Will you kindly inform me what the proper explanation of the word may be?

Answer.—A vacuum is merely a space where there is nothing. That is the dictionary definition, but as used in everyday talk and in reference to sanitary matters, it refers to a space from which the air has been exhausted to a greater or less degree. When this occurs in pipes there is a tendency for the water adjacent to this space to rush in and fill it on account of the pressure of the external air. Nature always endeavors to establish an equilibrium of pressure, and it is because of this law that we are able to make use of the suction pump, that device illustrating what a vacuum is and how its presence operates. In raising the plunger of a pump the air in the pump chamber is

exhausted and a vacuum formed, or, strictly speaking, a partial vacuum. The result is that the normal air pressure on the water forces it up to fill this chamber and so establish equilibrium. A repetition of this process enables us to raise water. An absolute vacuum is a space from which the air has been completely exhausted or expelled. A partial vacuum means that the air has only been partly exhausted, and the result is that the pressure there is lessened to a greater or less degree. In an absolute vacuum the pressure gauge would fall $14\frac{7}{10}$ pounds, as compared with the record in the atmosphere.

A Peculiar Furnace Experience.

From E. E. PALMER, *Harrisburg* — In *The Metal Worker* of the 9th I noticed an article "A Peculiar Furnace Experience," and became interested in it and also your reply. Please allow me to offer the following as cause for the "peculiar experience." The room from which the attempt is made to draw cold air to the furnace is already supplied with means for the escape of the air in the room, and more besides, and it is the strong draft in the fire place flue that causes the cold air pipe to have the contrary movement of air in it. The amount of air carried out of the room through this flue is probably in excess of the amount delivered through the warm air register, and the cold air pipe is simply acting as a supply pipe which allows enough air to come into the room to supply the demand of the fire place flue. The cold air currents which were objectionable might have been caused in one of two ways. The fire place acting as a ventilator for the whole house drew all the cold air on the floors toward it, or, if the room was kept closed during cold weather, the warm air register could not deliver air enough to supply the fire place flue, consequently every crack and crevice around doors and windows admitted air, which, entering the room, would be drawn directly to the fire place flue and cause cold currents on the floor of the room. I believe the fire place to be the cause of the back action in this case, and while it is admitted that the fire place is a good ventilator, many times they ventilate too much, and it becomes necessary to partly close them up with summer pieces or in some other way so that the outlet will not be so great. The opening to many of them is from 3 to $3\frac{1}{2}$ feet above the floor, and I have known of cases where it was impossible to warm a room until the opening had been reduced and the cold air drawn off at the floor.

From R. S., *Brooklyn.*—I notice the letter from "C. S.," Cleveland, Ohio, in *The Metal Worker* of March 9. If "C. S." and all other furnacemen would imagine a house was submerged in water they would have less trouble in solving their heating problems. The pressure throughout all parts is equal until the heat is applied by the furnace, which makes the air lighter. There is an unlimited supply of cold air to enter the furnace, and when the air is heated it will rise. When an exhaust pipe is taken from a room to the base of the heater a circulation should follow unless the heat makes it escape through some other channel. In the case reported there seems to have been no circulation of air. but an ample supply of air forces heated air up what should be the return pipe of the circulating system. This shows that there is a faucet open on the system somewhere, and until this faucet is closed circulation will not exist. I will suggest to him to hunt for this faucet and close it. If the fire place shown on his sketch is open in all probability he will find that it is the faucet.

Collapsed With a Vacuum Valve.

From M. A. C., *Petoskey, Mich.*— Recently we had a 30 gallon copper boiler collapse, and are at a loss to know what caused it. The boiler was connected with a range in the usual manner. On top of the boiler in the supply pipe was a $\frac{3}{4}$ inch vacuum valve, the supply pipe continuing down into the boiler with a hole in the delivery pipe near the top. We get our water supply from a reservoir located on a hill. The water is pumped through the mains to the reservoir, and at the pumping station there is a pressure of 120 pounds. When the water becomes dirty they close the valve near the reservoir and open one near the pumping station, drawing all the water out of the main. The boiler collapsed while drawing the water out of the main. The vacuum valve was in good condition when I examined it soon after the boiler collapsed, and was not stuck fast with sediment. There is about 40 pounds pressure on the boiler when in use, and the water is carried direct from the main to the boiler. I should like to know what caused the collapse and what will prevent it in the future.

Note.—If the vacuum valve was loose and in working order, it probably became so through the jar and shock of the collapse. Had it opened when the tendency toward a vacuum occurred, air would have rushed in and the collapse would have been prevented. If our readers can give any light on this subject we shall be glad to hear from them.

Paste for Asbestos Paper.

From W. H., *Indiana, Pa.*—In *The Metal Worker* of March 2 I see an inquiry from J. Callahan & Sons of Cleveland, who want a paste for putting asbestos paper on hot air pipes. If he takes his paper and soaks it with water and puts it on the pipes with plenty of lap, it will stay there. It also can be put on steam pipes in this way with excellent results.

From J. R. L, *Binghamton, N. Y.*— In reply to the inquiry in *The Metal Worker* of March 2 respecting paste for asbestos, would say that I have found the best method to stick asbestos on heater pipes is to lay the paper on flat and rub with the hand until a paste is formed of the asbestos. I found that simply wetting did not make it stick sufficiently.

Wants to Stop a Gas Leak.

From J. M., *Greencastle, Ind.*—Is there any known way of stopping a line of gas pipe from leaking which is inclosed in a partition and under floor without taking it out?

A Question in Furnace Construction.

From CONTACTOR, *United States.*— I don't mind opening up on "Contention," having read his letter in *The Metal Worker* of February 23. In the first place he is wrong, like the whole furnace trade, in calling the upper section of his furnace a radiator, because air does not heat appreciably by radiation. If it did not radiate any more than an iceberg, but still kept hot, it would answer just as good a purpose in a furnace. Air is heated by being brought into contact with a hot surface, and then passes along and heats other cool air by mixing with it. Consequently, a more sensible name for the internals of a furnace would be "Contactor." Now, the United States having got into contact with Canada, I will proceed with the contention. As air is heated by contact I am strongly in favor of a space between the fire pot and the contactor. If the contactor is cast as a part of the ash pit air cannot pass up on the inner side, hence that surface of the contactor is lost, and also that of the fire pot. If the space between the contactor and the casing is too great the air current passing will not be heated on its outer side. I was talking only yesterday with a bright and successful furnaceman who sets furnaces in three States, and he incidentally remarked that he had used all kinds of furnaces, but got the best results from a style he pointed out. It had a cast iron central dome surrounded by a circular steel contactor. He calculated that he got a large amount of hot air from the space inside of the contactor. Take a 40-inch casing and put a 32 inch solid top contactor in it, and the area of the air space will be about 450 inches Now make the contactor of the two-cylinder type, making the inner cylinder 24 inches in diameter surrounding an 18 inch dome. They will make first class heating surfaces and the construction will give an air space of 200 inches in area. The air from this space will be hotter than the other air and will increase the capacity of the furnace at least one-third. Have an air space by all means, "Contention," and arrange your contactors to make them available. If you want your contactor to be a radiator, arrange a circular sheet iron contactor to surround it. This contactor should reach from the middle of the fire pot to the top of the radiator-contactor, then by absorbing radiant heat and being hot on both sides it will split the air currents, and doing double duty as a secondary contactor it will prove almost as efficient as a primary contactor.

Which is the Best for Furnace Tops?

From T. O. M., *Adams, N. Y.*—Replying to the inquiry of "J. C.," Cleveland, that appeared in *The Metal Worker* of March 2, would say that I think he will be obliged to look somewhere else for the difficulty with his furnace work. Taking the hot air pipes from the top of the hood is considered good form in this cold country where there is room to do so and still give the pipes free pitch from the furnace to the registers. Let him take a good, thorough look all around and see if he does not find some other cause for the trouble. Especially let him see if there is any way of taking the cold air out of the rooms into which he wishes to introduce hot air.

STEAM AND HOT WATER.

The Steam Fitters' Convention.

A letter has been received by *The Metal Worker* from J. Leland Wells, chairman of the Executive Committee of the Master Steam and Hot Water Fitters' Association of the United States, stating that the seventh annual convention of the association will be held in Philadelphia on June 13, 14 and 15. This is the same week that the National Association of Master Plumbers hold their convention, and is to enable those who are interested in both associations to attend both conventions.

The Carton Boilers.

The Carton Furnace Company, Utica, N. Y., have brought out a line of Carton safety sectional steam and hot water boilers which the trade will be interested in reading about. The illustrations presented herewith show very completely the construction of the Carton steam boiler. The hot water boiler is of the same general appearance without the steam trimmings; the description, therefore, will suffice for both. In designing the apparatus it was made so that the products of combustion would, it is claimed, impinge positively upon over 90 per cent. of the surface, nearly all the surface being horizontal, while the circulation of water is vertical. Especial care was taken in arranging and proportioning the water and steam passages so as to assure perfect circulation at any pressure. Fig. 1 shows the Carton steam boiler with side cut away, revealing the flue arrangement and showing the course of the products of combustion. The boiler is made in portable form and can be set in brick if desired. All joints are screwed and are on the outside of the boiler, where they can be easily reached. Attention is directed to the large doors over the fire box, which give easy access to the smoke flues, so as to permit their thorough cleaning from the front of the boiler. In Fig. 2 is shown an intermediate section, the water back section and smoke drum which forms the diving flue. A recess is shown on the water back section, forming a flue through which the smoke and gases rise before traveling through the lower smoke ports to the front of the boiler, where they again rise and travel to the rear of the boiler through the top smoke ports, where the fuel products may be taken direct to the chimney through the upper smoke collar or carried to the bottom of the smoke drum through the return flue to the chimney. The cut shows the horizontal boiler surface and the double corrugations in the fire box and water back. Fig. 3 is a view of the intermediate section of the boiler, showing more clearly the water ways and water line, while Fig. 4 is a back section of the boiler. It is mentioned that the vertical curved water ways in the steam space directly above the water line act as relief ports and prevent any foaming of the boiler and allow the steam to pass off perfectly dry. In Fig. 5 is presented a view of the grate used in the Carton steam boiler. It is the Smyth duplex, and can be easily shaken and dumped. It is operated by a lever bar in front, and in case repairs are at any time necessary any grate bar can be removed through the feed door without disturbing the entire grate. The steam boilers are made in eight sizes, with fire chamber measuring from 15 x 20 inches to 57 x 20 inches, and adapted to heat with covered mains from 393 to 1264 square feet of direct radiation. The hot water boilers of similar size are adapted to supply with covered mains from 750 to 2500 square feet of direct radiation. Tables furnished by the Carton Furnace Company give likewise the rating of the

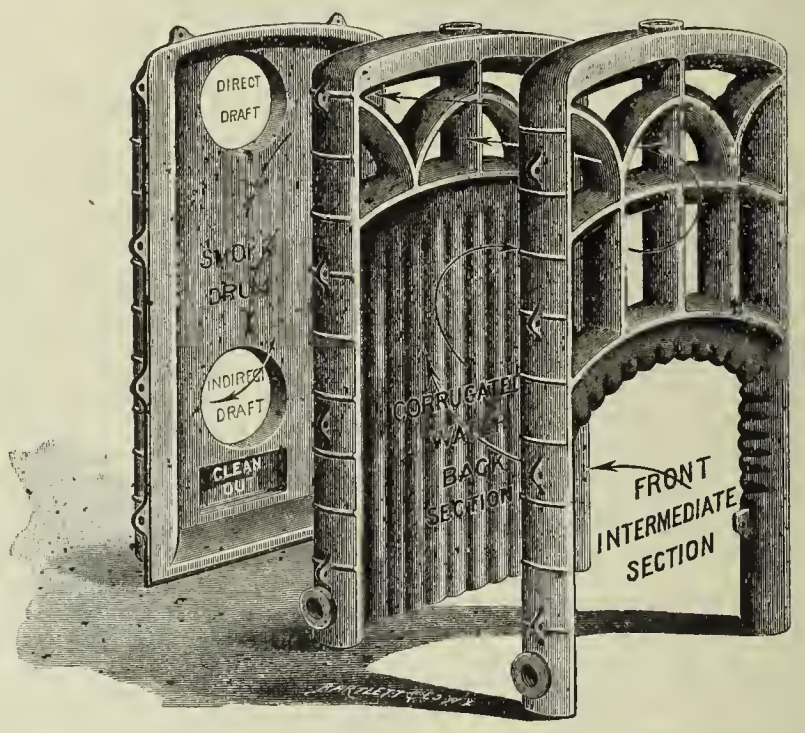
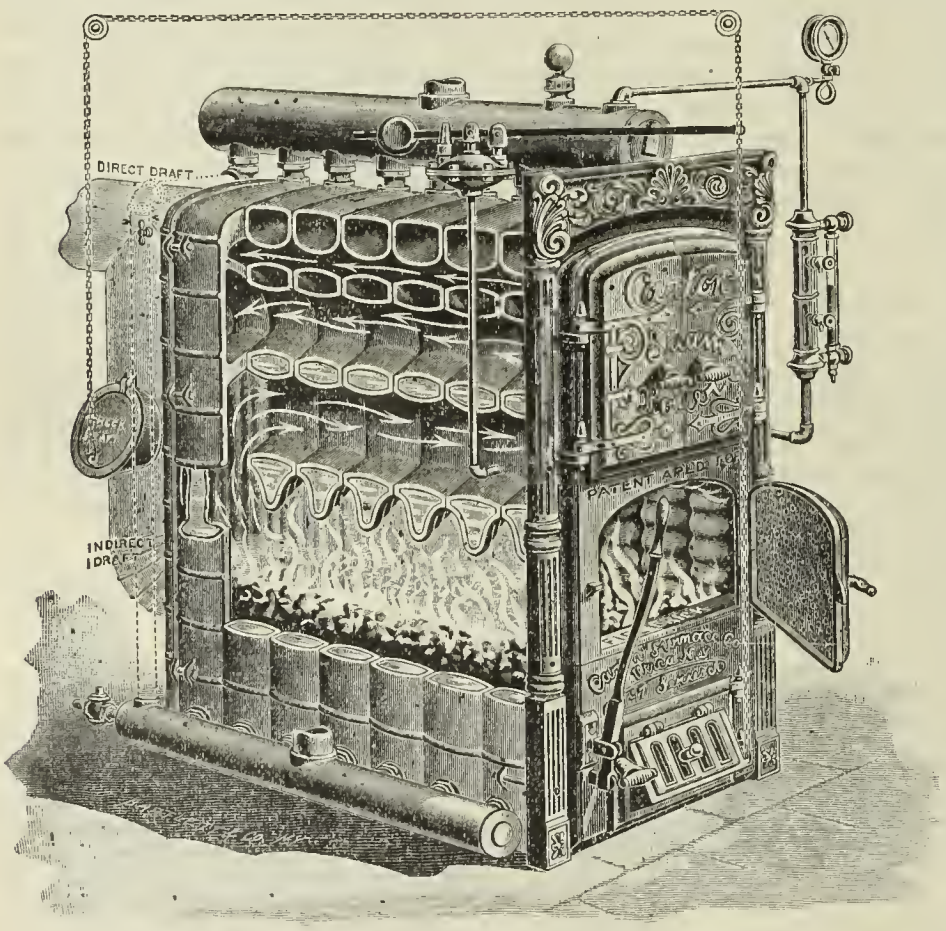


Fig. 2.—View of Sections.



The Carton Boilers.—Fig. 1.—Broken View of Steam Boiler.

Carton boilers for greenhouse and conservatory heating. William J. Baldwin, the well-known heating engineer, has made an exhaustive test of the boiler, and the report, which is as follows, will be read with interest in connection with the description :

The boiler was composed of a front, three vertical intermediate sections forming a fire box, and a back section. The sections were connected at their lower outside extremities by 2 inch lock nut nipples with return pipe headers, and at their top centers, in like manner, with a steam header. The grate area was 20 x 21 inches, and the grate was of a rocking pattern. The fire box is formed by a fire brick lined front. The three intermediate sections and one back section were corrugated in two directions, a large corrugation being formed in one direction, while across the large corrugation, in the other direction, was formed a smaller corrugation, the whole of which presented a large heating surface, in direct opposition to the fire. The general arrangement of the boiler provided for taking the products of combustion backward over the fire, thence upward and forward through one set of flues, and re turning it again to the rear by a set of passages formed in the castings and above those already mentioned. As the boiler is intended as a house heating boiler, either as a steam or as a hot water boiler, and as it was more convenient to make the trials as a steam boiler, the boiler was set up to simulate actual conditions of low pressure steam heating. The boiler was connected with an ordinary chimney of about 35 feet in hight, with natural draft and slow combustion. The trials were made at a steam pressure of 5 pounds, and cold water was fed into the boiler at a temperature of 52°.F. per pound of combustible— the ashes and clinkers having been weighed back —was 10.07 pounds of water from 52° F. to 5 pounds pressure of steam. The equivalent evaporation per pound of coal from water at 212° F. to 5 pounds pressure of steam is 10.2 pounds of water. combustible burned per square foot of grate per hour was 4.76 pounds. The amount of water evaporated from 52° F. to 5 pounds steam pressure per square foot of average boiler surface per hour was 2 17 pounds. The equivalent evaporation of water from 212° F.

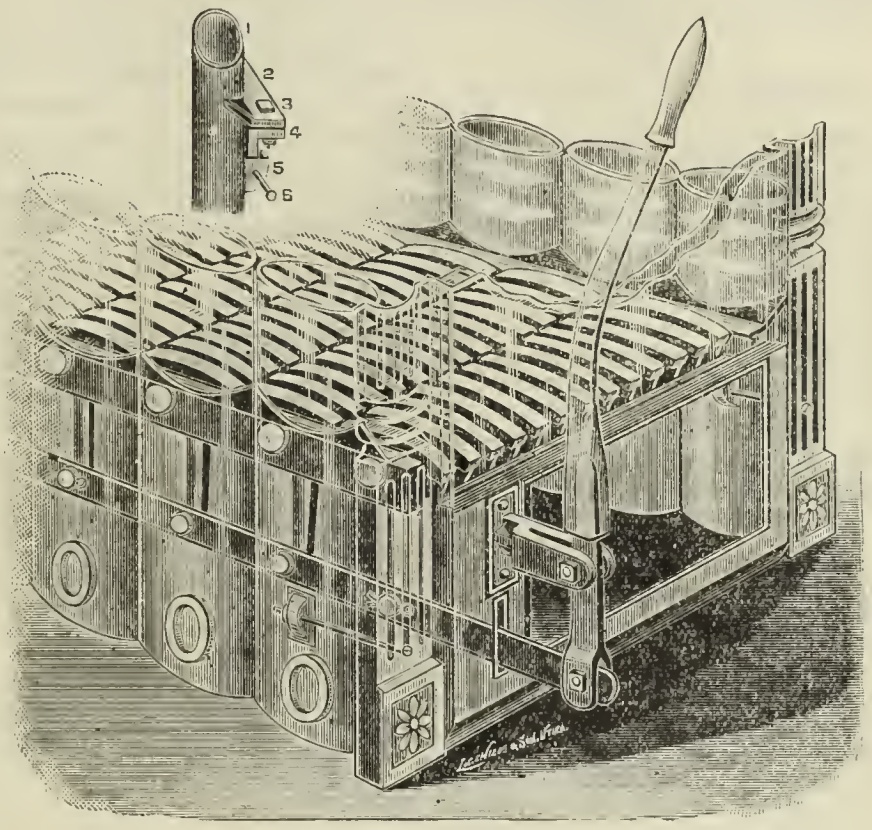


Fig. 5.—Grate.

The equivalent evaporation, therefore, from the temperature of the return water, in a gravity apparatus, to low pressure steam is approximately 10 to 5 pounds steam pressure, per square foot of average boiler surface per hour, is 2.368 pounds of water. Calorimeter tests of the quality of the steam were made from time to time which showed that the steam was practically at maximum density, or in other words, the steam was dry.

The rating of the No. 4 boiler above described and tested is 640 square feet of radiation for house heating by steam when the pressure is low (say 1 to 5 pounds). The above calculation of heating surface is based on the use of 5 pounds of coal per square foot of grate, and forms the maximum condition for a house heating boiler. You will note that when the rate of combustion is equal to 5 pounds of good anthracite coal per square foot of grate per hour 1 square foot of average boiler surface evaporated sufficient steam for 10 square feet average radiation, an exceedingly high efficiency and rarely obtained in practice. The low temperature at which the gases of combustion entered the chimney, ranging from 3° to 21° above the temperature of the steam, shows that the boiler utilizes about all the available heat of the fuel.

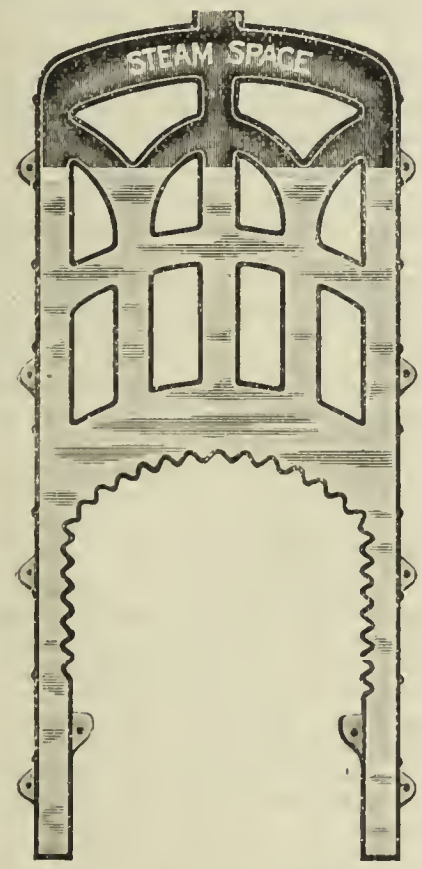


Fig. 3.—Intermediate Section.

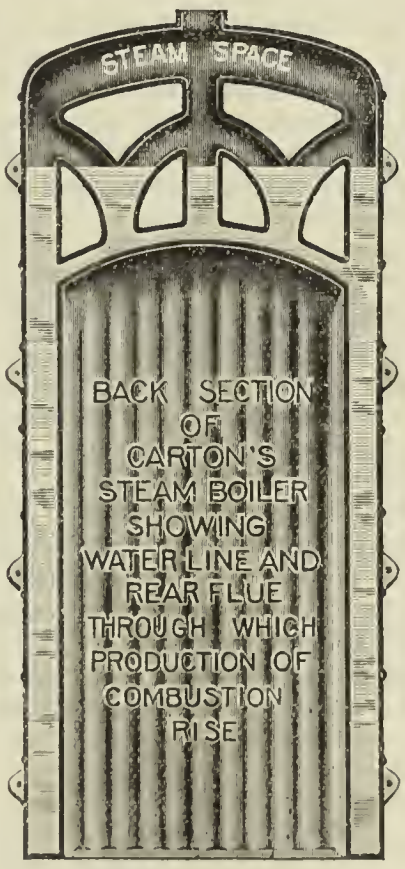


Fig. 4.—Back Section.

The temperature of the flue gases as they passed through a short smoke pipe ranged from 230° F. to 248° F. during the trials. The evaporation of water from 52° F. to 5 pounds pressure of steam was 9.32 pounds of water per pound of dry coal. The evaporation pounds of water per pound of coal. The equivalent evaporation per pound of combustible from water at 212° F. to 5 pounds pressure of steam is 11.02 pounds of water. The amount of coal burned per square foot of grate per hour was 5 14 pounds. The amount of

---

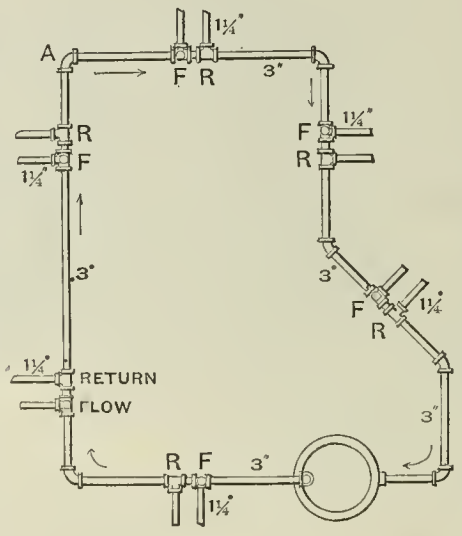
The Haydenville Mfg Company, 73 Beekman street, New York, have issued a compactly arranged catalogue of 372 pages, devoted to Brass and Iron Valves and Cocks for steam, gas, water, oil and chemicals; also Engine, Pump and Ship Builders' and Machinists' Supplies and Tools and Plumbers' Material. Among the goods of which the company make a specialty, under the common name of Haydenville, are included Finished Lavatory Valves, Gas Log Valves, Needle Valves, Disk Globe Valves extra heavy, Quick Opening Hot Water Radiator Valves, Fire Hose Valves, Double Gate Valves, Throttle Valves, Packed Plug Steam Cock and Bayonet Top Oil

Cups. In addition to the foregoing a specialty is also made of Steam Pressure Regulators, Elevator Regulating Valves, Vanwie's Swing Check Valves; Engine, Globe and Angle Valves and Cushman's Steam and Water Vaporizers. The catalogue is miniature in size, measuring about 4 x 6 inches, and is fully illustrated, with prices.

A Circuit Hot Water Job.

From L. E, *St Louis.*—Knowing that all the editor of *The Metal Worker* has to do is to answer the questions that are put to him these hard times and dull days, and having nothing to do myself, I ask a few questions, just to keep the editor busy and also, perhaps, gain some information. I wish to know what rule is used to calculate the number of feet of radiation that different sizes of pipe will carry in hot water systems. If there is no rule please state how many feet of radiation in ordinary house heating can be carried by 1, 1¼, 1½, 2, 2½ and 3 inch pipes. In all of the shops in which I have worked different ways of figuring are used and every "boss" claims to know it all and that the other fellow does not know what he is talking about. I am looking over a set of plans this evening in which the architect specifies a single 3 inch circuit main to be used for both flow and return. The flow pipes to the radiators are to be taken from the top of the main and the return pipes to be connected at the side of the main, thereby forming two currents of water in pipe. The architect says (and of course he knows it all) that he has one heating plant of this kind in operation at St. Louis giving perfect satisfaction. There will be 745 square feet of radiation in the plant, and what is a mystery to me is how two currents of water can be formed in one pipe. I have an idea that it is done in the same way that two trains moving in opposite directions pass on a single track. I would like to hear from some of the practical hot water readers upon this subject. The sketch shows the heating plant, which is to be put in on the one-pipe system with the highest point in the circuit main at A.

Note.—In *The Metal Worker*, October 20, 1894, a circuit system of hot water piping was shown in a combination plant, and on March 2, 1895, the lecture on hot water heating by James Mackay gives information on running circuit mains and the capacity of pipes to carry radiation. Sometimes the area of a 1-inch pipe is considered sufficient for 100 feet of radiation, but under low temperatures of water and long runs or exposed pipe, an area of 1 square inch is better and seems to have been used in determining the size of the circuit main in the plant mentioned. All rules in reference to heating increase in value with the excellence of the judgment with which they are applied, hence the sizes of pipes mentioned will carry the following approximate radiation: A 1-inch pipe, 75 feet; 1¼-inch pipe, 150 feet; 1½-inch pipe, 225 feet; 2-inch pipe, 350 feet; 2½ inch pipe, 475 feet, and a 3-inch pipe 750 feet. With the increase in diameter of a pipe there is a decrease in the surface to lose heat in proportion to the bulk of water carried, so that many fitters use more radiation than is given above. In reference to the plan submitted it is quite probable that the architect has employed some expert heating man to make the plan and specification, as that is a growing custom, and it is possible that as the architect has confidence in his advice he will insist on the letter of the specification and consequently is hardly open to criticism. In the opinion of some successful men it would be wrong to make the high point in the circuit main at A. It should be highest at the boiler and have a fall throughout its entire length until it returns to the boiler of 1 inch in 8 feet, then at the boiler it may drop down and connect at the bottom. In circuit mains the size should be ample—that is, one size



A Circuit Hot Water Job.

larger than would be used on a two-pipe system—in order that the supply of hot water be sufficient to reach the farthest radiator without being greatly chilled by the return water from the intervening radiators. There will never be two currents of water in the pipe if properly run, as the cooler water will fall to the boiler and the hotter water will continue to lose heat and fall as soon as it leaves the high point at the boiler. There may be a sufficient difference in the temperature of the water in the pipe to show very plainly, and it is possible that the colder water will fall or flow freely toward the boiler. Under some conditions it might be possible for the colder water to hold the hotter water in check before reaching some radiator, and by this means interfere with the radiator being heated. The opinions and criticisms of our readers have been invited by our correspondent.

On Wednesday morning a fire broke out in the building of Gillis & Geoghegan, 33 and 35 South Fifth avenue, New York, which entirely destroyed the building and their stock and tools as manufacturing and contracting steam fitters. Their loss is reported to be $75,000, on which there is insurance to the amount of $66,000. Nikola Tesla, the electrician, occupied the fourth story of the building as an experimental laboratory. The cause of the fire has not been traced.

HEATING NOTES.

The Eaton, Cole & Burnham Company, manufacturers of Water, Steam and Gas Fittings, now at 61 Beekman street, New York, are about to move into the Postal Telegraph Building, at Broadway and Murray street. They will have a commodious suite of offices on the fourth floor overlooking Broadway. The secretary, Wm. H. Douglas, in alluding to the new departure said it might be thought to require some courage to do this, but they had found their goods were more and more going into the Hardware trade and this would put them in Hardware territory. This location is a very convenient one, and the company will be in possession of more room than was obtainable in their present quarters.

A defect in the heating apparatus in the Universalist church, says a Watertown local paper, lowered the temperature below 45° Sunday morning, and it was very cold in the building. Rev. Libbey humorously insinuated that he was a stanch Universalist, but that a little fire wouldn't go bad at all just at that time.

The H B Smith Company, 133–137 Centre street, New York, favor us with pocket maps of the States of New York and New Jersey. The front cover proclaims the company manufacturers of steam and hot water heating apparatus for warming all classes of buildings. The back cover shows a cut of their popular Cottage boiler and a list of their boilers, the Mercer, Gold, Mills and Cottage, also their radiators, the Union, Royal Union, Imperial Union, Champion Union, Reed and Whittier direct radiators and the Gold indirect pin radiator. If the maps showed the location of their goods throughout these States, the towns, rivers and railroads would be lost to view.

The Acme Boiler & Radiator Company of St. Paul, Minn., have filed a certificate of amended articles, changing the name of the corporation to the Universal Heating Company.

A London, England, exchange says: "The Lyceum was the first theater in the world to be lit by gas. This was in 1803; but as the audience complained of the odor it was soon discontinued. Now the Vaudeville Theater has won the place of honor as being the first place of entertainment in England to be heated throughout by electricity."

The American Boiler Company will be represented in the State of Iowa by E. C. Molby, who takes the place formerly occupied by J. T. Ryan.

At a meeting of the Board of Managers of the American Society of Heating and Ventilating Engineers held last Monday, B. F. Stangland was appointed chairman of a committee to secure designs for a badge for the society. It was also decided that the board would hold regular meetings at 2 o'clock in the afternoon on the first Monday of each month. A regular date for these meetings was set, so that those who have business which they would like brought before the society may forward their communications to P. O. Box 1818, New York City, prior to that date.

Serrill & Schenck, 39 Cortlandt street, New York, agents for the Webster exhaust feed water heater, are equipping the paper mill of F. S. Field & Co. of Boonton, N. J., with a large size Webster vacuum feed water heater. This will be connected with the dryers,

some of which are 4 feet in diameter and 8 feet in length, steam being admitted to the dryer through the journals on one side and the condensation being exhausted through the journal on the opposite side. It is said that with their system sufficient vacuum is formed to lift the water from the bottom of the dryer through a pipe which reaches nearly to the bottom to withdraw nearly all the water from the dryer. In the past it has been the custom to stop the machinery as frequently as it became necessary, and bleed the dryers of the water which had accumulated by means of a cock. A very material saving is said to be effected by returning this condensation to a hot well, from which it is pumped to the boiler.

CHAS. GORTON of the Gorton & Lidgerwood Company, 96 Liberty street, New York, recently returned from a trip among the steam and hot water heating trade in New England, and reports that the Gorton boiler, both for steam and hot water, has acquitted itself to the satisfaction of all users during the recent cold spell.

HIGGINS & Co , 379 Lexington avenue, New York, are distributing among their patrons a small mirror, on the back of which is their address and the Richmond trade-mark in blue, and the words "Victor steam and hot water heaters" around the outer edge in white letters on a red ground.

EDWARD GURNEY of the Gurney Hot Water Heater Company, Toronto, Can., was a visitor last week at the office of Johnson & Co., 71 John street, New York, who are agents for the Gurney steam and hot water heaters in New York.

ON FEBRUARY 18 P. K. Dealy gave "a plain talk" before the Chicago Steam Fitters' Protective Association on the Williames vacuum system of steam heating. This system is an arrangement of apparatus for drawing the steam and condensation from the piping by suction instead of forcing the circulation by pressure. Exhaust steam is utilized without back pressure on the engine, so that the cost of both power and heat is said to be no greater than the cost of power alone; and when used with appliances in which live steam only is available for heating at high pressure, it is said to be almost equally valuable. It is claimed that with this system better heating has been had with a pressure of 2½ pounds at the boiler than has been previously secured from the same piping under a pressure of 80 pounds.

THE NIAGARA RADIATOR COMPANY of Buffalo, N. Y., are distributing very artistic hangers, illustrating the Niagara radiator. The hanger is composed of heavy cardboard, eyeleted at the top for hanging on the wall. The company are also issuing cards giving all dimensions of the various sizes they manufacture. Their radiating surface is rated as follows: 38 inches high, 7 square feet per loop; 32 inches, 6 square feet; 27 inches, 5 square feet; 21 inches, 4 square feet.

JAMES A. HARDING, whose address is Vineyard Haven, Mass., has severed his connection with the Paul Steam System Company of Boston.

According to an estimate based on actual traffic returns, the *Railway Age* computes that the railroads of the United States paid in wages and other operating expenses $100,000,000 less in 1894 than they did in the previous year.

HEATING ✂ PLUMBING.

NEW WORK AND CONTRACTS.

THE CHARLES H. SIMMONS COMPANY, 72 Market street, Chicago, are to install steam heating plants in the store building of Heywood & Morrill, 272 Wabash avenue, and in the flat building of Perley Hale, 6833 Prairie avenue.

COOK & CHICK, 253 and 255 Kinzie street, Chicago, have the contract for steam heating in the flat building of Dr. Peter Fahrney, 938 and 940 Park avenue.

DURING FEBRUARY the hot water and steam heaters made by the J. H. McLain Company of Canton, Ohio, whose Chicago office is at 58 Dearborn street, were installed in the following buildings in Chicago alone: Two heaters, Newbres Building, 431 East Forty-sixth street; residence J. H. Neill, 4225 Drexel Boulevard; residence W. H. Mahnka, 4227 Calumet avenue; residence John Ott, 630 North Roby street; two heaters residence Jos. Cormac, 680 Ione place; residence S. Mayer, Drexel Boulevard and Forty-third street; residence M. Blocki, Forty-third street; residence S. H. Rosenthal, Indiana avenue; two heaters residence Geo. A. McClelland, Kenilworth; residence Dr. Matteson, 4934 Vincennes avenue. In addition to these they report sold but not yet delivered six Cambridge steam heaters for the flats erected by W. H. Sear at Sixty-second street and Calumet avenue, and steam heaters for the new and handsome Pardridge residence on the South Side. Country trade has been very good also with them. These sales do not include their business in their Oxford perfect blast furnace, which, all over the country, has exceeded their expectations for trade so early in the season.

IN GEORGE W. SCHLICHTING'S residence the heating and plumbing were done by Joseph Dugdale, Bridgeport, Conn. The former is known as the siphon hot water system, which works satisfactory. He also has the plumbing contract for Dr. E. T. Payne's new block and two stores and apartments.

H. C. HURLEY, representing the Buffalo Forge Company, Buffalo, N. Y., has completed the heating and ventilating plant in the Ninth Ward School at Rutland, Vt.

A. W. HUNTER, North Adams, Mass., is putting hot water heating apparatus into Dr. W. E Brown & Son's new sanatarium. Two Perfect boilers are used and there will be 131 radiators in the building.

FREDERICK SCHOLEFIELD, 310 South California avenue, Chicago, is to do the plumbing and drainage in the flat building of E. W. Schan, 1281 Bonney avenue.

PAUL H. JAESCHKE, 72 Centre street, Chicago, has the contract for the plumbing and drainage in the residence of Paul and Albert Dennis, Warren avenue, near Crawford.

PORTER & KLEIN, 100 Thirty ninth street, Chicago, have the contract for the plumbing and drainage in the store building of E. Rice, Forty-seventh street, near Union.

ELLIOTT & RYAN, 272 Fifty-fifth street, Chicago, have the contract for the plumbing and drainage in the building of J. R. Flood, Madison avenue, near Sixty-second street.

BINDER BROS., 132 Lake street, Chicago, have the contract for the plumbing and drainage in the flat building of O. Forgerson, 269 North Robey street.

THE J. W. BROWN PLUMBING COMPANY, 364 Lincoln avenue, Chicago, are to do the plumbing and drainage work in the residence of C. A. Hull, Greenleaf and Grand avenues.

CHARLES C. BREYER, 187 West Division street, Chicago, is to do the plumbing and drainage in the four cottages of W. H. Giesecke, 901 to 907 Elk Grove avenue.

ALEXANDER M. MAYPOLE, 816 West Van Buren street, Chicago, has the contract for the plumbing and drainage in the flat building of J. D. Thompson, 1175 West Monroe street.

T. W. CORBETT, New Haven, Conn., has nearly completed the plumbing of the new Gay apartment building. There are 50 water closets, 46 porcelain lined bathtubs, all with exposed nickel fixtures. J. H. McCormack of Wallingford is putting in a McCormack steam boiler and the H. B. Smith Company's Gold radiators.

ARCHITECT JACKSON has awarded to the Barlow Bros. Company, Waterbury, Conn., the contract for plumbing the alterations to Peter Brooks' house.

THE VANDERMAN PLUMBING & HEATING COMPANY of Willimantic, Conn., have been awarded the contract for piping the new shoe factory at Colchester.

THE EQUATOR STEAM BOILER, made by the Nason Mfg. Company, 71 Beekman street, New York, will be used in heating a five story apartment house for A. Taylor, Brooklyn, and two apartment houses for the Estate of B. A Aycrigg, on Thirty-third street, New York.

MULHERN & PIATTI, 44 East Forty-second street, New York, are installing the heating plant in the fire engine house at White and Elm streets, New York, and in an office building at 89 and 91 Fifth avenue. They have recently completed the heating plant in a 12-story office building, 50 x 200 feet, at 627-629 Broadway. Horizontal tubular steam boilers were used in all of these buildings.

FARRELL & CONATON, Lowell, Mass., have been awarded the contract for plumbing in the insane department of the Almshouse.

THE BOARD OF EDUCATION, Kinsman, Ohio, is contemplating putting a new furnace in the school building in the near future.

A SPECIAL MEETING of the building committee of the Board of Education of St, Louis was held last week to consider the question of heating and ventilation for the new schools to be built this summer. Professor Kinealy's report was read with care by all the members, and, in consequence of it, the fan ventilating hot blast system of the Marquette will be adopted at the following schools at cost given: Columbia, $6000; Charless, $8000; Benton, $6000; Riddick, $6000; Dumas, $8000; Nebraska avenue, $4000. In making bids for this system the firm must guarantee 2000 cubic feet of fresh air per minute for each room. Parties must furnish their own plans and specifications. At the Washington and Ashland School additions it was decided to put in the direct and indirect steam system, as the boilers are still new and could amply supply heat and ventilation. The Green

Lea Place School, a four-room building, will temporarily be supplied with furnaces taken from other schools. The total expense for all heating apparatus will be $44,000. Bids will be received until April 5.

WM. FAUST, Pittston, Pa., has the contract for the plumbing and gas fitting in the Lazarus Block.

MCKEOUGH BROS., Utica, N. Y., have been awarded the contract for the plumbing in the McGarvey Building.

OTTO L. PETERSON, 217 West North avenue, Chicago, is to do the plumbing and drainage in the flat building of M. Oleson, 104 Potomac avenue.

ARNOLD BROTHERS, 507 South Western avenue, Chicago, have the contract for the plumbing and drainage in the flat building of J. Heperlee, 1456 Lexington avenue.

WILLIAM C. BLETSCH, 1216 Belmont avenue, Chicago, is to do the plumbing and drainage in the flat building of M. Crosby, 1538 and 1540 Sheridan street.

FRANK MEEK, 486 West Eighteenth street, Chicago, has the contract for the plumbing and drainage in the flat building of John Charvat, 769 Van Horn street.

ERNST GARNER, 174 Milwaukee avenue, Chicago, is to do the plumbing and drainage in the flat building of H. Oleson, Sheridan avenue, near Cortland avenue.

J. ZIELINSKI, 1014 North Hoyne avenue, Chicago, is to do the plumbing and drainage in the flat building of J. Blase, 1048 Lincoln avenue.

THE ALCOCK PLUMBING COMPANY, 102 Twenty-second street, Chicago, have the contract for the plumbing and drainage in the Methodist Publishing House, 1517 North May street.

NELSON & CEDERHOLM, 87 West Ohio street, Chicago, are to do the plumbing and drainage in the residence of A. Larson, Berry avenue, near Jefferson street.

NOBLE & THUMM 290 Lincoln avenue, Chicago, have the contract for the plumbing and drainage in the residence of H. Orlikowsky, 202 Warren avenue.

GEORGE ECK, 2208 Archer avenue, Chicago, is to do the plumbing and drainage in the residence of J. W. Luse, 6742 Sherman street.

ALWIN W. BAHN, 393 Gross Park avenue, Chicago, has the contracts for the plumbing and drainage in the store building of Frederick Schmidt, Otto and Walsott streets, and in the store and flat building of Henry Riedmayer, Roscoe and Perry streets.

NEILL BROTHERS, 495 Forty-third street, Chicago, are to do the plumbing and drainage in the flat building of Richard Kelly, 5928 La Salle street.

FREDERICK NEUSTADT, 300 North avenue, Chicago, has the contract for plumbing and drainage in the flat building of W. F. Brehm, 220 Seminary avenue.

PAUL H. JAESCHKE, 72 Centre street, Chicago, is to do the plumbing and drainage in his flat building at 516 Evergreen avenue.

RICHARD T. WARD, 1489 West Harrison street, Chicago, has the contract for the plumbing and drainage in the flat building of P. F. Doyle, 1480 same street.

PARK BROTHERS, 79 Dearborn street, Chicago, are to do the plumbing and drainage in the flat building of John Jeffrey, 6214 and 6216 Greenwood avenue.

WELLS & MALLMAN, 134 Centre street, Chicago, have the contract for the plumbing and drainage in the flat building of C. S. Thornton, 7928 Honore street.

JOHN C. GUNDERMANN, 182 North avenue, Chicago, has the contract for the plumbing and drainage in the residence of E. Fischer, Ashland and Grace avenues.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to install a steam heating plant for the four store and flat buildings of K. E. Roberts, Cottage Grove avenue, Thirty-first street and Rogelsby avenue. Four locomotive boilers and 600 radiators will be required.

THE CONTRACT for the heating plant for the new Baptist Church building, at Seventh and Fulton streets, Chester, Pa., has been awarded to Harry S. Riley, the West Third street plumber. The plant will cost about $1500.

ALEXANDER WUERZ, Norotod, Conn., has awarded the contract for plumbing and heating his new $20,000 residence to Jos. Dugdale of South Norwalk.

D H. KELLY, Derby, Conn., has nearly completed the plumbing and heating of the Plumb Library, in Shelton. A horizontal Bigelow boiler has been used.

ARCHITECTS BROWN & VON BEREN have a new two family house for Jos. Bowden, Jr., of Stamford. Each apartment will have five rooms, with hot water heat and all improvements, and the cost will be about $6000.

THE EXETER MACHINE WORKS, 32 Oliver street, Boston, Mass., are furnishing Exeter boilers and radiators for the new post office at Lynn, Mass.

THE HIGH SCHOOL BUILDING at Amherst, Mass., is to have a system of heating and ventilation.

IN EXAMINING the City Hall at Detroit, Mich., which is to have a new $6000 ventilating plant, it was found that a soil pipe had been tapped to carry off roof water where the fan drew sewer air through the opening.

EVANS, ALMIRALL & Co., 41 Dey street, New York, are installing a heating plant for the Scovill Mfg. Company, Waterbury, Conn., using Evans' exhaust system of hot water heating.

S. G. RICHARDS, 1454 Broadway, Brooklyn, is installing a heating system in the Broadway Temple, Brooklyn. It will be the plenum system, using a Pride of Brooklyn steam boiler.

PROPOSALS for heating and ventilating Winthrop and Shores streets schools, at Taunton, Mass., will be received at the office of the city clerk until March 23.

JOSEPH C. J. WAINWRIGHT, Brighton, Mass., has been awarded the contract to furnish the heating and ventilating galvanized iron pipes to a large summer cottage, the Cartworld, at Bar Harbor, Maine. The plumbing will be done by Lumb & Mitchell, Boston.

EVERETT J. WINN, Dedham, Mass., has secured the contract to do the plumbing at the new Avery school building in East Dedham.

BIDS for the plumbing in the new barracks being erected at Sackett's Harbor, N. Y., are asked for.

THE CONTRACT for the heating of the new Mooney and Brisbane Building, at Buffalo, N. Y., has just been awarded to the L. H. Prentice Company of Chicago. The radiation is to be supplied by the American Radiator Company, about ten carloads being required.

A STEAM HEATER is to be placed in the Almshouse at Wakefield, Mass.

HOLYOKE, MASS., will spend $10,000 in ventilating school buildings.

The returns of the foreign trade of the Dominion of Canada for the six months ended December 31, 1894, show a shrinkage of $6,322,000 in the value of imports, while native exports held their own satisfactorily. The figures are given as follows:

	1894.	1893.
Imports for last six months	$54,572,395	$60,894,062
Exports for last six months	72,599,132	77,604,390

The decline in imports was general in all branches, but a very few articles exhibiting any increase. As regards the falling off of about $5,000,000 shown in the value of exports, the explanation is given that this is due entirely to a lessened shipment of American agricultural products sent through Canadian ports, the shrinkage in value of which was $5 500,000. Home commodities exported show a slight increase, minerals and live stock giving the principal gain in this respect. Timber exports are the only ones that fell off to any extent, being $1,600,000 less than in the last half of 1893. This decline is attributed to the dull condition of the United States market, as Great Britain bought $2,000,000 worth more wood and timber than in the preceding period.

It is expected that the new Atlantic liner "St. Louis," now building for the International Navigation Company at Cramp's Ship Yard, Philadelphia, will be ready to make her maiden trip early in June. The "St. Paul" will follow her consort early in September. These two vessels will be operated on the main line between Southampton and New York in conjunction with the "New York" and "Paris." This will involve several changes in the arrangement of the International Navigation Company's passenger traffic, and only twin screw steamers will thenceforth be operated on the main line.

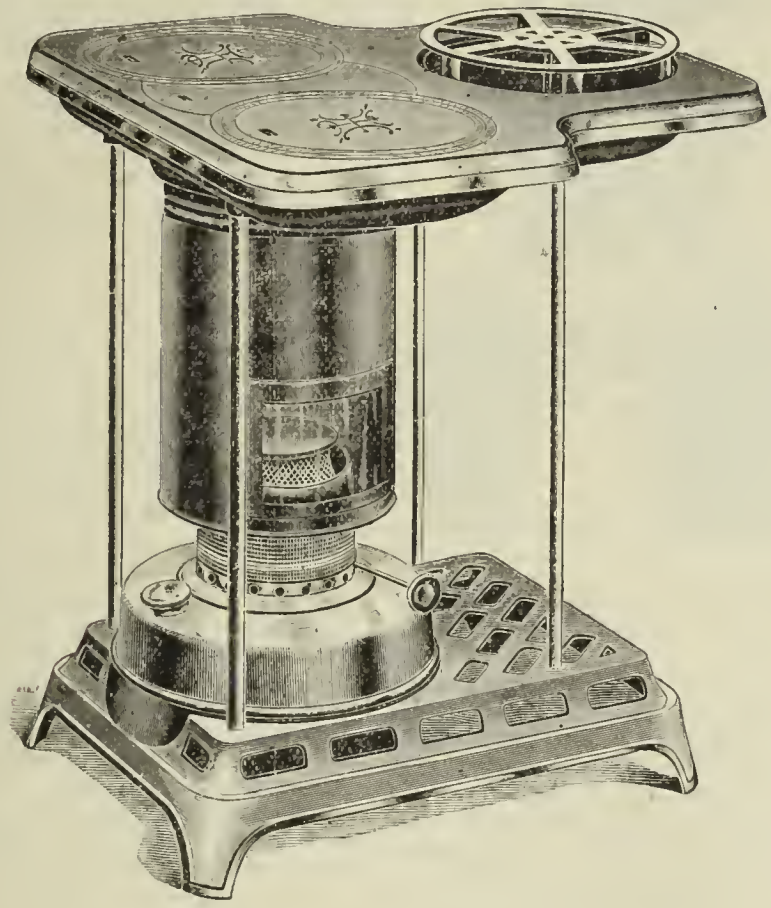
A certificate of incorporation has been filed in New York by the New York and Brooklyn Tunnel Company, with a capital stock of $100,000. It is proposed to build a tunnel between East Sixteenth and Whitehall streets, New York City, along the most direct and feasible route under the bed of the East River to a point in Brooklyn between North Eighth street and Atlantic avenue. The length of the road to be built is estimated at about two miles. It is to be an underground railroad, standard gauge, and to be operated by electricity or other motive power. The directors of the company are: Thomas A. Patteson, Jr.; Charles J. Schlegel, Walter J. Aims, John C. Bucken, Charles Kuehnemundt, John V. Bouvier, Jr., Frederick P. Delafield, Frank H. Knight and Samuel S. Slater.

A project is on foot to utilize Glen Falls, in Ontonagon County, Mich., in developing electric power wherewith to operate a number of abandoned copper mines in the neighborhood. It is calculated that in the existing fall 4377 horse-power is available, and that it can be increased.

THE RETAIL STORE.

The Ladies' Delight Oil Cooker.

A recent addition to the assortment of oil cookers manufactured by Page Brothers & Co. of 227-233 Cambridge street, Boston, Mass., is the new Ladies' Delight, an illustration of which is presented in the accompanying engraving. This is claimed to be something of a departure in the line of oil cook stoves and represents the results of many years' experiment. The manufacturers feel that in the Ladies' Delight they have the "neatest, most efficient, most compact and easily managed oil cook stove ever presented to the public." From an inspection of the engraving it will be seen that in the top surface there are three cooking holes, each being 8 inches in diameter. The rear one is intended for the reception of the oven, which is of large capacity, being 18 inches long, 14 inches high and 12 inches wide. The makers state that they use the same kind of burner and font as that employed in connection with their Beauty oil heater. Some of the special points claimed for the Ladies' Delight as now made include the following: 1. There is no drawing up of the flame and tendency to smoke. 2. No heating of the oil reservoir, producing what is termed "sweating of oil," necessitating constant care and wiping. 3. No generation of gas from heated oil and liability of explosion and catching fire. The heater here shown is known as No. 10, and the font has a capacity of 1 gallon of oil, which it is claimed will burn from 10 to 12 hours. The tubes and font are of heavy seamless brass, and as the double central draft is embodied in the construction of the cooker, the font remains cool and perfectly safe. The oven used is especially adapted for the Ladies' Delight and is made with extra large side door and double shelves.



The Ladies' Delight Oil Cooker.

Enterprise Raisin Seeder.

The Enterprise Mfg. Company of Philadelphia, Pa., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, are introducing another labor saving device which they have named the Enterprise raisin seeder, shown in the accompanying engraving. The raisins, after stemming, are fed into the hopper, the revolving of the crank forcing the raisins between a rubber roller and toothed cylinder, permitting the seeded raisins to drop into a receptacle while the seeds are discharged through a spout. It is said the ordinary washing usually given raisins is sufficient to insure better results than if the fruit is pressed through dry. The family size will seed, it is said, 1 pound of fruit in five minutes, a larger size for hotels, bakeries, &c., having a greater capacity. Both are tinned. The family size is numbered 36, that for hotels 38.



Enterprise Raisin Seeder.

Crescent Automatic Spray and Force Pumps.

The Crescent Brass & Iron Works, Detroit, Mich., are putting on the market the spray and force pumps herewith illustrated. The one shown in Fig. 1 is described as a reservoir pump, with a heavy brass cylinder, an extra large galvanized iron air chamber, 4 x 11 inches in size, and a galvanized iron suction rod. The spiral spring is referred to as being made of heavy spring brass wire, and the valves of non corrosive metal. The saucer shaped foot has a strainer on the top to prevent clogging with dirt from the water. Two nozzles are furnished with each pump, in which a sprayer is adjusted; also 12 inches of good rubber tubing. It is explained that the reservoir may be filled and the pump carried "a-field," and that with the fine spray adjustment the liquid used will last from 10 to 15 minutes; or, if desired, the pump may be made to work as well from a pail. The pump shown in Fig. 2 is designed for bucket use only, but otherwise is similar to the No. 1. It has a galvanized air chamber 2 x 10 inches, a heavy brass cylinder. metal valves, brass



Fig. 1.—Pump No. 1. Fig. 2.—Pump No. 2.

Crescent Automatic Spray and Force Pump.

spiral spring and a saucer shaped anti-clogging foot. The length of the rubber tubing is 12 inches.

Ideal Water Filter.

The Germ Proof Filter Company, 16 Cedar street, New York, have brought out an improved water filter, as shown in the accompanying cuts. Fig. 1 represents the direct filter, known as the Cataract, which is 3½ x 3 inches in size. The top is of cast brass, in one piece and nickeled, as are all the metal parts. Connecting the top and bottom is a perforated hollow metal pipe, which passes through a natural stone filter 2 x 2 inches in size with rounded edges. The top and bottom of the filtering block are made tight with rubber washers, thus compelling the water passing into the reservoir between the filter and heavy outer glass case to make its way through the filtering stone into the inner pipe and so out at the bottom. There is an inside thread cut in the circular rim forming part of the upper cap, by means of which the apparatus is screwed to the permanent faucet. Fig. 2 illustrates the same filter with

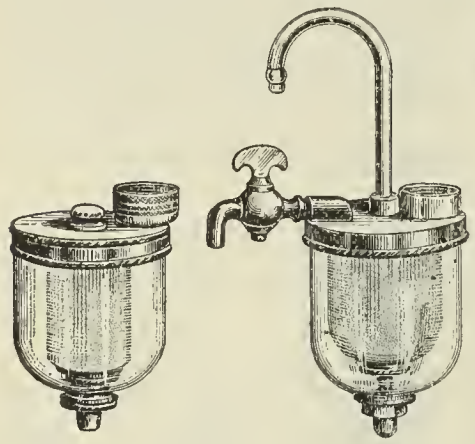


Fig. 1.—Direct Cataract Filter.

Fig. 2.—Ideal Filter for Filtered or Unfiltered Water.

goose neck attachment and extra faucet. Filtered water is delivered through the goose neck, while unfiltered water passes more rapidly through the faucet seen in the cut. The filtered supply is controlled by the main faucet on the water fixture. The filters are quickly taken apart, when any accumulation of matter can be instantly brushed off the stone block. Underhill, Clinch & Co., 94 Chambers street, handle this article in New York and nearby territory.

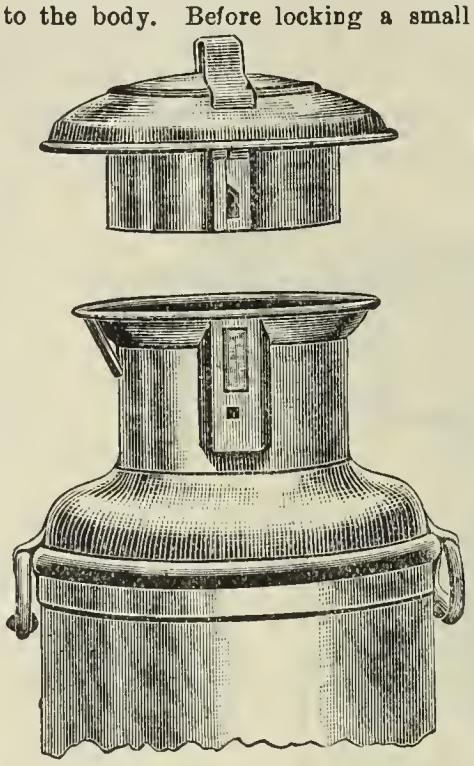
Air Tight Waste Trap.

The Baldwin Refrigerator Company, Burlington, Vt., use on their refrigerators a closed waste trap. It is in cup form, with a screw top, having a short pipe passing through the cover and down nearly to the bottom of the cup. This is slipped over the waste pipe of the refrigerator. Near the threads on the upper portion of the cup are openings through which the waste water drips. The trap is made in this form, it is explained, to prevent warm air ascending the drip pipe and to prevent water splashing the bottom of the refrigerator when doors are suddenly closed. The trap can be taken apart for cleaning, and is referred to by the manufacturers as simple and effective.

THE FRANCE SNYDER COMPANY have opened a new stove store at 523 Madison avenue, Covington, Ky. The concern are the successors to the late J. M. McClung, who was in business for many years in that city.

The Evans Protective Milk Can.

We show in the accompanying illustrations the special features of the Evans protective milk can put on the market by Keen & Hagerty, Baltimore, Md. Fig. 1 shows the body of the can with the top or cover detached, indicating the manner in which the cover is locked to the body. Before locking a small



The Evans Protective Milk Can.—Fig. 1—View of Can with Top Removed.

card or seal on which the shipper writes his name is inserted in the lock, and in order to unfasten the top a nail or some sharp instrument must be inserted in the opening of the lock. Doing this breaks the seal and the receiver therefore by examining the seal before unlocking the can is enabled to see at once if the seal has been tampered with and by this means locate the trouble. The cover furthermore has a rubber gasket making it impossible to pour the milk out of the can by upsetting. The features of this lock will be more fully understood by referring to Fig. 2, which is an outline sketch of the lock itself. It is pointed out that the advantages of this device



Fig. 2.—Detailed View of Lock.

are that it prevents tampering with the contents and thus settles all disputes of measurement, quality, sediment or adulteration. It is simple, does not get out of order and requiries no padlock or chain or extra key.

MEMORANDA.

FOOTE & SHEAR COMPANY, Scranton, Pa., have removed their wholesale hardware business from 513 Lackawanna avenue, where it was established 45 years ago, to 119 Washington avenue. They will occupy seven floors 25 x 155 feet in the new Carter & Kennedy Building, giving them more than 27,000 square feet of floor space. The building is fitted with all necessary fixtures and appliances for the transacting of the large business which this firm enjoy. The capital stock of the company has been recently increased. They will continue the wholesale and retail hardware, plumbing, tinning and heating departments as heretofore, but with largely increased facilities.

MCLENNAN & MCFEELEY, hardware merchants, have sold out their Victoria business and have concentrated their concern in Vancouver, B. C.

N. KLEIN of Richmond, Va., issues an announcement under recent date to the effect that on February 16 he admitted W. P. Klein to one-third interest in his business and appointed George Klein his attorney. The business will hereafter be conducted under the style and title of N. Klein & Son, who will assume all liabilities of and collect all outstanding bills due the old firm. The new concern are located at 620 East Broad street and carry a complete line of stoves, ranges, fire place heaters and house furnishing goods. They also give attention to tinning, plumbing and gas fitting.

LEFEBURE & Co. of Chillicothe, Ohio, have removed their store from the old stand to 32 East Second street, where their entire establishment is now on the ground floor. They make a specialty of mantels and grates, and handle a smoke consuming furnace made by the Otsego Furnace Company.

THE AVERY STAMPING COMPANY, Cleveland, Ohio, have been appointed Western agents for the full line of Housekeeping Hardware, Garden Tools, &c, manufactured by C. W. Dunlap & Co. They intimate that with the increased facilities of the manufacturers customers may rely upon the prompt and satisfactory filling of all orders, and state that all inquiries for catalogues, prices, &c., from trade located west of New York City should be addressed to the company at Cleveland.

J. W. GREEN, Canandaigua, N. Y., has bought out the interest of the Canandaigua Tinware Company of that place and will continue to manufacture the improved Queen Cooker and will likewise do general jobbing, plumbing and steam fitting.

THE RINGEN STOVE COMPANY, St. Louis, Mo., issue a neat catalogue relating to the Quick Comfort refrigerators, the merits of which they commend to the trade with perfect confidence. In the introductory pages they speak of the general construction and some of the details are illustrated and carefully described. The casters are shown in this way, likewise the trap. A broken view illustrates the circulation in the refrigerator; then follow the illustrations of the different kinds of hardwood refrigerators, covering some 17 pages. A number of grocers' and butchers' refrigerators are likewise illustrated and so are sideboard refrigerators and ice chests. Tables of sizes and prices are given with the illustrations.

Remarking on the present condition of the anthracite coal trade, the Philadelphia *Ledger* says that the trade continues to show that the companies are practically disregarding all efforts at restriction and are mining about all the output their collieries can produce. They are now going on at a rate which will put upon the market for the current month at least 4,250,000 tons, instead of the allotment agreed upon of 3,500,000 tons.

ROOFING AND CORNICE.

A New Roofing Slate Association.

For some little time past the condition of affairs in the Bangor slate region has not been altogether satisfactory to leading operators, and a meeting was recently held for the purpose of correcting, if possible, some of the existing evils. A movement was instituted which has resulted in the formation of what is known as the Bangor Roofing Slate Manufacturers' Association, the object of which is to maintain a uniform scale of prices for genuine Bangor slate, and to sell direct to the trade, or through the hands of four dealers, namely: Auld & Conger of Cleveland, Ohio; John D. Emack of Philadelphia, and E. J. Johnson & Co. and John Galt & Sons of New York City. The association will issue a card to the salesmen so that the trade will know that no one offering Bangor slate is authorized so to do unless he can show authority direct from the association. The latter have also adopted a certificate which will be stamped with the official seal as a trademark, being signed by the inspector, and will be attached to every invoice that goes out, certifying that car No. is loaded with genuine Bangor roofing slate. The architects of the country will be furnished with a copy of this certificate, and if they will request or compel the party furnishing the slate to produce the certificate, the purchaser will know whether or not he is getting what is called for. This course of procedure has been taken by the association for the reason that Bangor slate is largely called for by architects and to prevent the substitution of inferior grades when Bangor is distinctly specified.

The next best grade of Bangor slate is what is known as the Albion Vein, at Pen Argyl, located 3 miles from Bangor, Pa. The manufacturers in this section have suffered largely by having inferior slates offered as their own, and it is believed that they will form an association similar to that at Bangor, adopting the same rule of sending out a certificate. The best element of the trade has requested some such action as this to be taken so that they can be assured that prices will remain firm and that all will pay the same price for their slate. In Bangor the formation of this association has taken away the petty jealousies and envy that have existed for some time between different manufacturers, and it is probable they will all act in harmony in the matter of lowering or advancing of prices. The manufacturers have adopted a price-list and have made it from 15 to 25 cents a square lower than last year's list. We understand that in the formation of the association mentioned there has been no effort at combination for the purpose of putting up prices, but simply for keeping them at such a level as will pay a reasonable profit and at the same time protect the name of the goods.

In connection with this matter the following, taken from the Bangor *Observer* of date of March 7, will prove interesting:

A meeting of all the slate manufacturers of the Bangor region, the Old Bangor Company excepted, was held last Thursday afternoon at the office of Thomas Ditchett. The outcome of the meeting is of great importance to the people of Bangor. For the past two months a bitter fight in prices has been in progress between the manufacturers, and slate was sold at ruinously low prices. Most of the slate region in the United States felt the bad effects of the strife. We are very glad to be able to state that the end of such a state of things has come. The meeting resulted in perfect harmony of action.

A list of prices was unanimously adopted, although much lower than the list that ruled so long, yet it was apparently satisfactory to all. The meeting had the assurance that the Old Bangor Company would heartily co-operate both in prices and also in the matter of issuing a certificate with each car of Bangor slate in order to protect the trade. This certificate will be issued from the general office of the manufacturers, signed by an inspector appointed for the purpose, whose particular duty will be to see that each shipment of slate shall be as stated in the certificate. The meeting adjourned with the best of feeling and of course every one was jubilant because of the final result. The companies were represented as follows:

American Bangor Slate Company, H. J. Reeder, Conrad Miller, J. E. Long and C. S. Colbert.

Bangor Excelsior, R. S. Brown.

East Bangor Consolidated, S. C. Smith and William Bray.

North Bangor, D. F. More.

Star, Charles Ford and Richard Payne.

Auld & Conger, W. E. Lloyd.

East Bangor Slate Mining Company, S. L. Fisler and James Masters.

Columbia Bangor, Thomas Ditchett.

Sub-Letting in Building Contracts.

Architects and intending builders have recently been in receipt of a protest from the Metal Cornice Manufacturers' Association against letting the different parts of a building to one general contractor. The communication bears date at Chicago and reads as follows:

Believing that the practice of letting the entire work upon a building to one general contractor, the different parts of the work to be in turn sublet by him, instead of letting those different parts direct to the contractors who are actually engaged in the different trades, is detrimental to the general interests of the owners, architects and building contractors, and believing that the practice is increasing, because of the efforts of those engaged in general contracting, while on the other hand, up to the present time, no set of men have taken the trouble to systematically oppose it, we shall herein attempt to present the arguments against it. We will consider how the matter affects the owner, the architect and the contractors for the different trades.

1. *As to the Owner.*—We have never heard it claimed that an owner could get a better or cheaper building from a general contractor than he could by dealing directly with the different contractors, and we do not see why he should. Any one will work at least as cheap for the owner, who has the money, as for a contractor, who often has no capital of his own, and depends upon getting the money from the owner with which to pay his sub contractors; the result frequently being disastrous to the sub contractor, if, through having taken the work too low, or if, through mismanagement, he does not get enough to pay the expenses of his business and his sub-contractors' bills. If, on the other hand, the contractor does have capital invested, so that one can safely do work at as low rates for him as for the owner, then some one must pay a profit on this capital, and that some one must be the owner, who may pay it directly in paying a higher price for his work, or indirectly by getting poorer or cheaper work than he had contracted for. It is good business policy to get rid of the middleman wherever possible, and the general contractor is surely one. It is certainly harder for the owner and more expensive for him to make changes on a building let to a general contractor than where the work is done directly by those engaged in the different trades, as on all changes the general contractor expects and demands his profit. To the owner again: Another and very material reason why work should be let in separate contracts, instead of in one general contract, is that the chances and the rewards to the general contractor of combination or pooling are so much greater that it is much more likely to be done. There are not many general contractors, so that it is comparatively easy for them to get together and arrange things, and the jobs taken as a whole are so large that it is worth while for them to try to make a combination, even if they cannot often succeed.

2. *As to the Architects.*—While we have never heard it claimed that by letting the work of a building to a general contractor the owner would get a better building, or that he would get one for less money, it is frequently asserted that work done in that way is less trouble to the architect and to the owner, and that it can be done in less time if it is let to one contractor rather than to several. When the first of the World's Fair buildings were figured, bids were taken for the entire building and for the several parts. The separate bids were in all cases the lowest, and the work was let and done that way. We have always supposed that those buildings were put up with unusual rapidity, which would seem to prove that to get work done rapidly it is not necessary to let the entire building to one contractor. That letting the work upon a building in separate contracts for the different branches is cheaper than letting it all in one, and that it need not result in slow work, is evidenced by the experience of the Board of Education of this city, who always divide their work, though they occasionally take figures the other way, but always find them higher than the separate bids. We could never see how a general contractor could get his sub-contracts done any more quickly than an owner or an architect could. We could never see what magic there is in a contract made by a sub-contractor with a general contractor that makes it easier for the general contractor to crowd him than it would be for the architect or owner to do it. If it is admitted that an owner is likely to get either a cheaper or a better building, or both, when he divides his contracts as much as possible, is he getting proper treatment at the hands of his paid professional adviser, his architect, when that architect counsels him to let his work to a general contractor, that advice being given, it would appear, for the purpose of saving trouble to the architect? Does the architect's plea that he himself is not paid sufficiently to enable him to give his client the advice that his best interests demand tend to raise the architect's profession in the eyes of his client and the general public? If his present rate of compensation is such that the architect cannot look after the details that he is expected to do where the

work on a huilding is divided, are there not several plans that an architect should adopt rather than advise the owner to let the work in one contract? If the architect is so situated that he or his office force can attend to it, why not let him demand higher compensation from the owner? If that will not do, if the owner will not pay 2, 3 or 5 per cent. more to his architect for looking after these details, why cannot the architect have some contractor or superintendent or clerk of the works take charge of that part of the work on a percentage of from 5 to 10 per cent.? We understand that it has been done. Or, a cheaper method would often he to have the owner hire some one on a salary to look after this part of the work.

The advantage of these two latter methods over letting the whole in one contract is that all the contracts will finally be let hy some one who will have more interest in getting good contractors, in having the work well done than does a general contractor, whose sole interest, or at least his paramount interest, is to get the job done cheaply, and that is the backbone of this protest; that the general contractor has so little regard as to how the work is done; that general contracting breeds and from its nature must breed a class of scamp subcontractors, to the loss of those who want to do good work. It is because we think that the architects take pride in their work and in their buildings and wish to have their buildings well built that this appeal is made to them, that this phase of the matter is presented to them. In the past, general contracting has not prevailed in Chicago as it has in the East, and we think that the present tendency comes from Eastern influences, both of architects and general contractors. We understand that general contracting has been in vogue in the East from colonial days, from before the days of architects, as it were; that in early days there was no architect. The contractor builder was everything; all in all. What power, influence and importance the architect has there now is largely in spite of the huilder. In New York a good many years ago an architect was hardly known. Most of the houses now are built by builders, and architects have little to do with them. The same state of affairs did and does exist at Philadelphia and other Eastern cities, so that the man who builds his own house in those cities is considered to have done something to distinguish him from ordinary people who buy theirs ready made from the speculating builder. The huilder has never heen so important here. The architect has always been more important, and why the architects should wish or even be willing to give up so much of their husiness and responsibility we cannot understand. It is suicidal for them to shirk or to let any one do for them any large part of what they have heretofore done as part of their duty and for which they are paid. It is a very sure thing that whatever trouhle the architect saves he must before long allow for either directly in what the owner pays him for his services or indirectly in the importance of his profession in the huilding world. At present an easy way for the architect or for the owner to ascertain which is the cheaper way to get work done is to take bids both ways—that is, from the general contractor for the entire job and also from the different trades in detail. We are perfectly satisfied to abide by the result of such tests. The general contractors will also probably he satisfied, as at present they are not as strongly entrenched in their position as they might be, otherwise they might take the position that was taken in Philadelphia some few years ago, where the Master Builders' Exchange announced that "members should decline to give estimates in the aggregate for work when the owner or his agent are receiving estimates in detail for the same." At Louisville also the Builders' Exchange adopted rules to the same effect.

When hids are taken hoth ways, it should, however, he understood that hids given to an architect for the different parts of the building are solely to enahle him to let the work in separate contracts; and that to disclose those bids, without the consent of the makers of them, to a general contractor to enable him to take the entire work, is as flagrant a breach of fair dealing as it would be to disclose them to any other competitor. We protest because it increases the cost of doing our business, as we sometimes have to figure five times as often as we should to get the same amount of work direct from the owners or architects. We protest because it tends to poor work, as very few general contractors are nearly so particular as to the quality of work done as they should be, and will let work to the cheapest man, often when they know the chances are against his doing a good job. The temptation to do this is strong. Their interest in the job is solely to make what they can out of it; they will not give a dollar preference for a first class job, where an owner would give ten; all they require is something that can be made to pass. We also protest because so many of the general contractors do not pay their subcontractors as promptly as they should; many of them do not pay nearly as promptly as they get their own money, and some of them refuse to settle with or pay their sub-contractors until long after they have received their own money. The tendency, from our point of view, is certainly to increase the cost of doing business, which must, when things are settled, come out of the owner; to lower the quality of the work, and to make the suh-contractors feel, even the best of them, that it is hardly worth while to do a good joh for an owner who thinks it is not worth his while to make a direct contract with him, or to recognize him in any way. The practice certainly tends to lower the standard of work aud to lessen the pride of the suhcontractor in his work.

Finish for Slate Roof at Ridge and Hip.

From M. A, *Suffolk, Va.*—Will *The Metal Worker* inform me how to make a ridge finish for a slate roof, the same being made from the slate with which the roof is covered, as shown by the inclosed drawings? I tried to put a ridge roll made of galvanized iron on the ridge and hips, but the architect claimed the effect was destroyed. Which is the better finish at ridge or hip, to have the slate lap and use roofing cement, or to have the ends butt together?

Answer.—In Fig. 1 is shown a portion of a slate roof as derived from our correspondent's drawing. The hip finish is made by laying one row of slate with the edges parallel with the hip. To make this finish a hip board, which is about one-half the width of the slate used, is first nailed to the hip, as shown in Fig. 2. This board can be cut on a bevel, being 1 inch thick at the hip and $\frac{1}{2}$ inch thick where the slate joins. The roof slate are then cut on a bevel so as to butt against the edge of the board. Paper can then be put over the boards, when the hip slate are to be laid as shown in Fig. 1, and secured by nailing. Another kind of finish is shown in Fig. 3, the hip slate being of double width, so that for a roof of the pitch shown they extend up the roof sufficiently to allow for proper nailing. If slate of ordinary width were used for this finish, as indicated by the dotted lines in Fig. 4, the slate would not extend up the roof far enough to be nailed. There are a number of methods for making the joints at hip or ridge. For the hip sheet metal caps can be

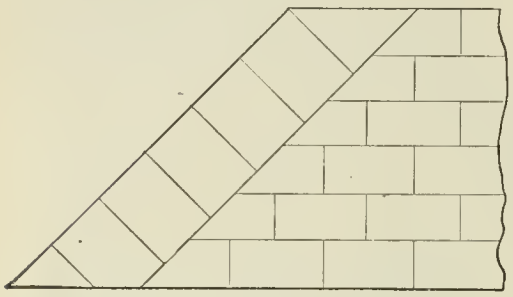


Fig. 1.—The Sketch Submitted by "M. A."

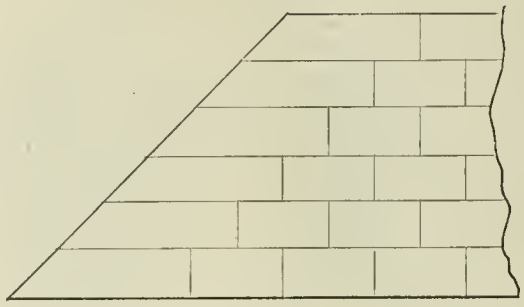


Fig. 3.—Double Width Slate Used at Hip.

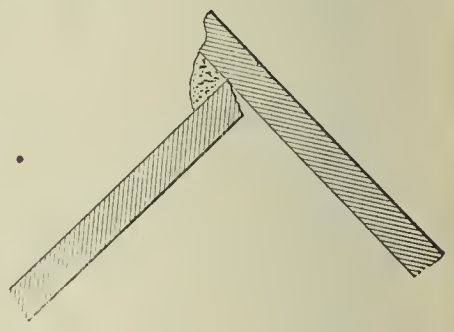


Fig. 5.—Lap Joiut at Ridge or Hip.

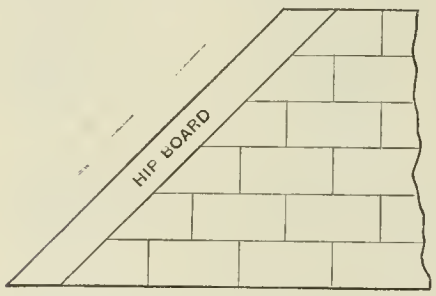


Fig. 2.—Strip of Board Applied to Hip.

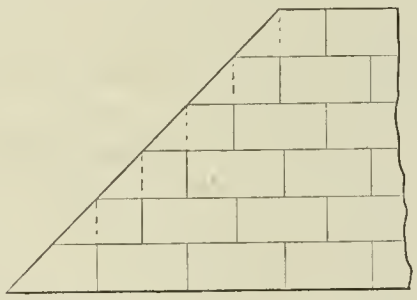


Fig. 4.—Finish Made with Slate of Usual Width.

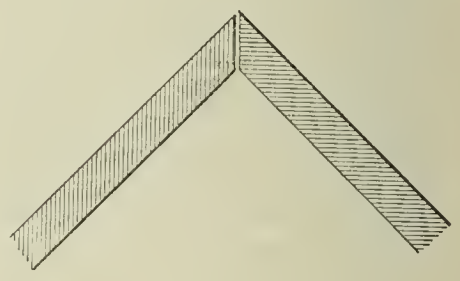


Fig. 6.—Butt Joint at Ridge or Hip.

FINISH FOR SLATE ROOF AT RIDGE AND HIP.

placed over the hip joints, being so laid as not to be exposed, but extending up the roof far enough to be nailed and laid with each row of slate. The slate can be laid with butt joints at the hip, as shown in Fig. 5. Another method is to dispense with the caps and bed the hip joints in roofing cement. Lapping the slate, as shown in Fig. 4, and then filling with roofing cement does not give as sightly a finish as is shown in Fig. 5. For a ridge finish the last row of slate can be laid with butt ends, being laid in cement at the ridge. Another method is to place bent strips of sheet metal over the ridge, the strips to extend on either side nearly as far as the last row of slate. After these strips are in position the slate are applied. When finishing without a ridge roll the nail heads can be covered with roofing cement. When making a butt joint, as shown in Fig. 6, the slate are to be cut from the upper side, thus giving the slate a beveled edge.

FLASHINGS.

THE 1895 CATALOGUE issued by the St. Paul Roofing, Cornice & Ornament Company, St. Paul, Minn., contains a great deal of information of interest to the roofing and cornice trade. In an introductory note they direct particular attention to their patent slip joint constructions, the plates being galvanized after they are stamped and thus given a perfect coating. They also allude to their system of remodeling, by which they can beautify an old or unsightly building, while offering, they say, an absolutely dry and warm construction. In the earlier psges a number of samples of galvanized work are illustrated, showing the material adapted to all sorts of buildings of all sorts of architectural design. Fine half-tone engravings, showing the appearance of their rock face plates, follow. The transformation of an old building is likewise shown. The ceiling work comes next, very handsome examples of this form of interior finish being presented. A number of pages are given up to cornices. Metal shingles are illustrated, likewise steel roofing. Toward the close of the catalogue a variety of miscellaneous articles are illustrated, such as conductor pipe, eave troughs, &c. Ridges, hip molding and finials are shown in various styles. Tables of sizes are given wherever called for, and prices accompany the illustrations.

HENRY BEUTELSPACHER, Bridgeport, Conn., has commenced work on his contract for metal work on the new German church at Torrington, and has just completed the plumbing and tinning of Christian Bitzer's new house on Sherman street. He also has a contract for piping, &c., at the Eckart brewery, and has the contract for the metal work and gas fitting at the new Greek church at East End.

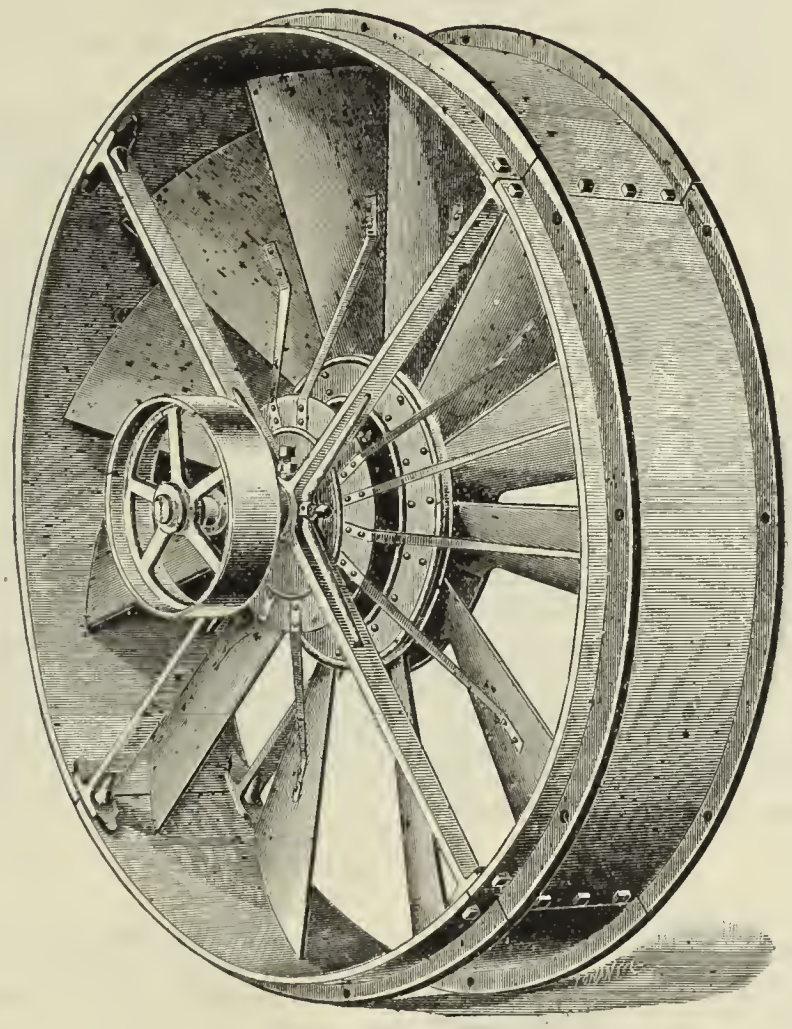
THE LOUIS BIEGLER CORNICE COMPANY have been incorporated at Chicago, with a capital stock of $10,000; incorporators, P. L Biegler, T. A. Delamater and F. B. Dickinson.

BEER & HESS have recently removed their cornice shop to more commodious and centrally located quarters at 119 West Thirtieth street, New York City. This move, we understand, was made necessary by the rapid increase in their business and in order to provide better facilities for turning out cornice and skylight work and for executing tin, slate and metal roofing.

A REVISED PRICE LIST for Bangor roofing slate was adopted at a recent meeting of the Bangor Roofing Slate Manufacturers' Association. Particulars of the change will be found in our trade report columns.

The Smith Flanged Ventilating Fan.

Our illustration shows the method of constructing the Smith ventilating fan, manufactured by the Huyett & Smith Mfg. Company, Detroit, Mich., of sizes 7 feet or more in diameter. It will be noticed that the case or rim of the fan is made in four sections, each section being firmly bolted to the fan arms. In order to facilitate the handling of these fans they are always shipped knocked down, or in other words, the arms, shaft and case are removed from the fan. They may be set up or put together very readily by simply bolting the different parts together. The hanger arms are made in sections bolted together at the center, forming a sleeve in which the journal box is secured and made adjustable by means of the four bolts engaging the sleeve with the bearing, as shown in the cut. The fan wheel is put together with bolts, and is also shipped knocked down. The blades of the wheel are provided with braces securing them to the brace disk, which in turn is secured to the fan shaft, thus making a strong, tight wheel. All parts are marked and numbered so that they may be put together without difficulty by any competent mechanic. As these fans are usually built in walls or partitions, they are provided with heavy angle iron flanges, which are firmly bolted to the fan case. These flanges are bored for anchor bolts, which extend clear through the wall in which the fan is placed, thus making the fan perfectly firm.



THE SMITH FLANGED VENTILATING FAN.

The hardness which is lacking in aluminum can, it is said, be imparted to it by the addition of chromium, under a new process just introduced. The method is claimed to render the aluminum as hard as chrome steel.

A new emery wheel was recently subjected to an unusual test by the Springfield Emery Wheel Company of Bridgeport, Conn. The wheel is 14 inches in diameter by 2 inches thick. It was run at a speed of 4000 revolutions per minute, which is nearly three times the usual speed of a wheel of this size. The wheel suffered no harm from the great strain to which it had been subjected.

The insurrection in Cuba is likely to exert a serious effect on the export business of this country with that island. Manufacturers are reported to be unwilling to do any business in that quarter except on a strictly cash basis. The trouble has already caused a falling off in the corrugated iron roofing trade with Cuba. The latest advices, however, point to the likelihood of the breaking up of the insurrection within a short time.

A consular report to the French Government from Cape Town, South Africa, mentions that house furnishing goods of cast and wrought iron and tinware have a very considerable sale in the Cape Colony. Copper kitchen utensils are rarely used. Enameled ware offers the best field.

PLUMBING and GAS FITTING.

Growth of the National Association of Master Plumbers.

In reviewing the work of the National Association of Master Plumbers, National President John Mitchell finds that during the present fiscal year 19 local and 5 State associations have been formed, and reckoned from the *per capita* tax already received, represent 283 new members, as follows:

Florida Association	18
Arkansas Association	30
Northampton, Mass	18
Asbury Park, N. J	12
Janesville, Wis	4
Harrisburg, Pa	15
Allentown, Pa	14
Scranton, Pa	21
Individual members	84
Aurora, Ill	6
Bloomington, Ill	5
Joliet, Ill	5
Springfield, Ill	8
Rock Island and Moline, Ill	10
Elgin, Ill	6
Danville, Ill	4
Ottawa, Ill	5
La Salle and Peru, Ill	5
Jacksonville, Ill	4
Mendota, Ill	4
La Grange, Ill	5
Total	283

It will be seen that, as compared with the same period last year, when there was an increase of 158 new members, there is an increase of 125 new members over the increase of last year. State associations have been formed in Wisconsin, Nebraska and Tennessee, which will further strengthen the National Association.

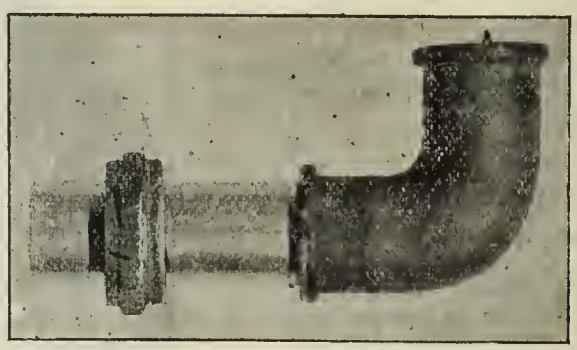
Plumbers' List of Manufacturers.

A year ago last April the National Association of Master Plumbers published a list of all the manufacturers and jobbers of plumbing material who approved the protective resolutions of the association, better known as the Baltimore resolutions. President Mitchell informs us that since that time many firms whose names are not on the list have signed the resolutions, necessitating the publication of a new list, copies of which will be mailed direct to the trade. He further states that several firms have complained of the omission of their names, and in order to afford all an opportunity to have their names especially recommended to the trade he invites all manufacturers and jobbers who approve of the resolutions to send to national headquarters, John Mitchell, 113 Hudson street, New York City, for copies for signatnre The new list will go to press on March 31.

ALFRED WHITE AND BENJAMIN S. COURTIS, Lynn, Mass., have left the employ of the L. A. May Company and formed a copartnership in the plumbing business. They will occupy Chamberlain's old stand on Mulberry street.

The Douglas Rubber Elbow.

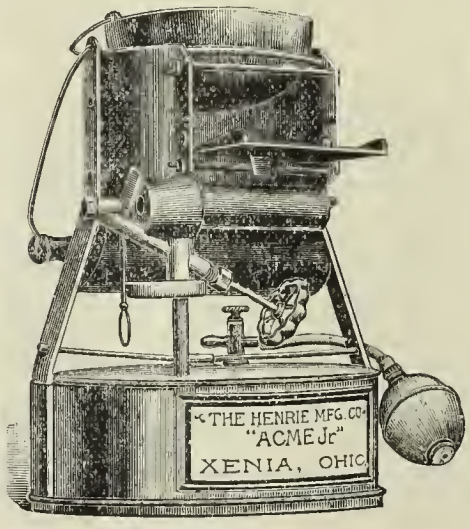
The John Douglas Company, 162 to 166 Poplar street, Cincinnati, have just brought out a rubber elbow for use in making tank connections with water closets, which is herewith illustrated. This elbow is fitted on a brass tube with a slip joint connection. A brass sleeve, threaded on the inside and fitted with a rubber washer, is placed on the brass tube referred to. It can be adjusted at any distance desired and tightly screwed in place. This elbow is claimed to insure a full and smooth water passage to the bowl. A 2-inch or vent connection of this description will also shortly be placed on the market. Geo. L. Bottum, 131 Lake street, is Chicago manager for the company.



The Douglas Rubber Elbow.

The Henrie Improved Plumbers' and Tinners' Soldering Furnace.

The Henrie Mfg. Company, Xenia, Ohio, have just brought out the improved furnace especially designed for plumbers' and tinners' use illustrated herewith. They say its construction is such as to be absolutely proof against leakage, the burner being so arranged as to require no packing. A blunt valve is used instead of the needle point, which, it is said, precludes any possibility of the orifice, through which the gasoline passes, from becoming enlarged. The arrangement of the burner is also such as to permit of its being turned in any direction for burning paint, melting a joint or heating objects, and does not require packing to keep it tight. As will be noted, the furnace is provided with an iron vessel for melting solder, &c., or the vessel may be dispensed with and a cover placed in position when it is ready for use as an ordinary tinners' furnace for heating soldering irons. Special claims are made by the manufacturers for its lightness and simplicity, it weighing but 6 pounds and comprises but two parts, instantly separable from each other.



The Henrie Improved Plumbers' and Tinners' Soldering Furnace.

Draining Plumbing Systems.

From G. D. B., *Canfield, S. C.*—We enjoy the letters of inquiry in *The Metal Worker* and the comments upon them very much, and we receive a great deal of information from them that is hard to get otherwise. We in our turn would like to ask our brethren of the colder climes how to arrange a system of plumbing in a residence so that there will be no trouble of freezing up and bursting of pipes in cold weather. Most of the houses here are built very open, with no provision for heating or keeping the pipes warm. In our work we place a stop and waste cock in the ground with a case around it and having a rod running up to a convenient point. The pipes are all graded so as to drain this cock. We are often told, however, that in the North, where the climate is more severe, no such trouble is required, and we suppose that it is because the pipes are better protected. We would like to hear from plumbers on this subject.

CAMP & CRANE, 27 Maiden lane, New York, display in their window several different kinds of shower baths, one being designed for use with the old style lever bath bibbs, a three-way brass piece being used to effect the connection. Rubber hose runs from two ends of the brass piece and connects with the bibbs. From the other end the hose for the shower or spray is connected. In this way the shower attachment may be used in connection with old bath fixtures.

Central Supply Association.

The quarterly meeting of the Central Supply Association, which is composed of the wholesale dealers and manufacturers of plumbers' supplies from Pittsburgh, Pa., to the Missouri River, was held Tuesday, 12th inst., at the Southern Hotel, St. Louis, Mo. There were present 72 members and 13 represented by proxy, making a total attendance of 85 out of a membership of 120.

Morning Session —The morning session opened at 10 o'clock and was devoted to routine business. The report of President Wolff was read and favorably received. The treasurer's report showed the finances to be in good condition, and the secretary reported a number of applications for membership which were favorably acted upon. The association then adjourned to meet at 2.30 p.m.

Afternoon Session. — The principal business of the afternoon session was the discussion of the motion to "request trade papers to discontinue quoting net prices on wrought iron pipe." This motion called forth considerable debate and was finally adopted, and the secretary directed to request the different publishers to abide by the resolution. At 5.30 the association adjourned.

At 6 30 the association sat down to a sumptuous banquet tendered them by the St. Louis Supply Association, after which they adjourned in a body to the Olympic Theater, where the opera "Robin Hood" was the attraction, and where all the boxes and the first three rows in the parquet had been reserved for them. The members of the opera troupe made some timely hits at the expense of some of the older members of the association, which were greatly enjoyed by those present.

The officers of the association are:

President, John F. Wolff, Chicago.

First vice-president, John Walker, Detroit.

Second vice-president, Theo. Ahrens, Jr., Louisville, Ky.

Secretary, Wm. M. Webster, Chicago.

Treasurer, O. F. Felix, Pittsburgh, Pa.

The St. Louis Supply Association is officered as follows: President, W. E. Althaus of the Western Brass Mfg. Company; vice-president, Thomas Cahill of Cahill, Swift & Co.; secretary, Albert Webb of Albert Webb Supply Company, and treasurer, G. F. Detrick of Ripley-Detrick Supply Company.

Eastern Supply Association.

The regular quarterly meeting of the Eastern Supply Association was held at 284 Pearl street, New York, last Tuesday. The following business concerns were represented: J. L. Mott Iron Works, DuBois Mfg. Company, Owen & Salter, Fred Adee & Co., J. Regester & Sons, Jno. Trageser Steam Copper Works, Mayor, Lane & Co., Hoy & Co., Haines, Jones & Gadbury, Curtis & Co., Colwell Lead Company, C. Hoffman, Jr., Eaton, Cole & Burnham Company, McNab & Harlin Mfg. Company, R. M. Wilson, Miller & Coates, Henry Huber Company, Stewart Ceramic Company, Smith & Anthony Company.

President John Reid occupied the chair.

The secretary reported a membership of 30 concerns, covering the following territory: New York, 17; Philadelphia, 6; Washington, 1; Baltimore, 1; Cohoes, 1; Utica, 1; Rome, 1; Trenton, 1; Albany, 1; total, 30.

The treasurer's report showed a balance of $900. The dues of the association were fixed at $10 per year, and it was agreed that the fiscal year of the association should commence March 1, 1895. It was stated that many letters had been received by the association asking who were entitled to recognition as dealers. On motion, it was decided that such queries can be answered only when they relate to its members.

A communication from the Association of Manufacturers of Heating Apparatus was received stating that "the members of this association agree not to exhibit any goods at the meeting place, or spend any money in entertaining the members of the Master Steam and Hot Water Fitters' Association or Master Plumbers' Association, either local, State or National, and that we also agree to discountenance, as far as possible, the sending of representatives to such meetings."

A communication was received from the Willets Mfg. Company, Trenton, N. J., stating that through the solicitation of the Central Supply Association all their ware is now being stamped with their name, and that they are using the iron pipe thread.

President Reid announced as a standing committee on entertainment, Messrs. Hoffman, Douglas and Trageser.

It was also announced that the National Executive Committee is composed of John Clifford, L. D. Lawnin and John Walker of the Central Supply Association; E. F. Souther, L. H. Tillinghast and F. J. Knox of the Plumbers' Supply Association of New England; and John Reid, Jas. E Salter and Henry S. Regester of the Eastern Supply Association.

The following resolutions were then unanimously adopted:

"*Whereas*, It has been customary in the past for manufacturers and jobbers of supplies to have their representatives attend the meetings of the State and National Associations of Master Plumbers, entailing a great loss of time on the part of the representatives and financial loss to their houses; be it

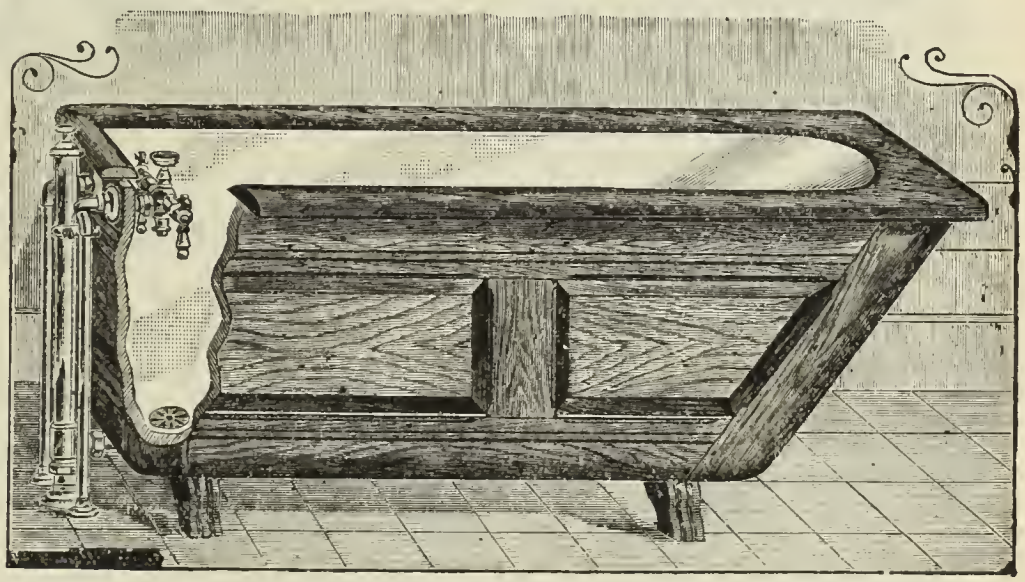
"*Resolved*, That this association discountenance such action in the future.

"*Resolved*, In case a State or local association of master plumbers makes a demand upon any member of this association to confine its sales of plumbing goods in that State or locality to members of said Master Plumbers' Association, such demand shall at once be referred by such member to the secretary of this association. The secretary of this association shall thereupon communicate in writing with the secretary of the Master Plumbers' Association of said State or locality, informing him of the fact that the policy of this association is to adhere strictly to the Baltimore resolutions, and that as the said Baltimore resolutions specifically state that licensed plumbers regularly engaged in the plumbing business, and with an established place of business, are entitled to purchase plumbing goods, this association does not deem it wise or expedient to depart from that rule. In the event of failure to receive redress from the local association, it shall be the duty of this association to again take up the matter and refer it to the secretary of the National Association, and to notify him that until such time as the boycott has been raised the operation of the Baltimore resolutions will cease."

There being no further business the meeting adjourned, and the members then repaired to the Fulton Club to partake of a luncheon prepared by the Entertainment Committee.

Hardwood Bathtub.

The accompanying cut shows a hardwood bathtub which C. A. Blessing, Philadelphia, Pa., has recently placed on the market. With the exception of the copper lining the whole of the tub is made of hardwood. The tub has round corners, molded legs and raised panels, and is fitted with Blessing's all nickel plated Novelty waste and overflow, double compression or Fuller bath bibb and pipes to floor. The tub is made in cherry, ash, oak and maple. Other styles of hardwood tubs are manufactured by Mr. Blessing, having round or square bottoms and corners, turned, molded or carved legs, paneled and plain casings, natural wood finishes, or handsomely painted and decorated, and with and without fittings. All tubs are made in the usual copper weights, 12 to 20 ounces, and in lengths running from 4 to 6 feet. They are also supplied in quartered oak or walnut cases. The tubs are meeting with a good reception at the hands of the trade, and are being specified by architects, particularly for bathrooms where natural wood wainscoting has been used. They are said to be exceedingly durable, and when the linings are worn out they may be easily replaced by new ones.

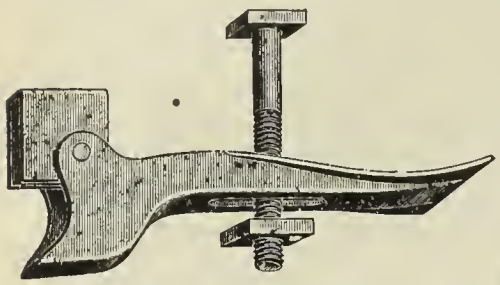


Hardwood Bathtub.

THE FACTORY of the Victor Company, at Blairsville, Pa., is about completed, and will begin making bathtubs and sanitary ware within two or three weeks.

Sherman's Basin Clamp.

We show in the accompanying illustrations Sherman's basin clamp, manufactured by the H. B. Sherman Mfg. Company, Battle Creek, Mich., and placed on the market through the jobbing trade. Fig. 1 shows the clamp itself, Fig. 2 shows it adjusted to a bowl with thick flange, while Fig. 3 shows



Sherman's Basin Clamp.—Fig. 1.—General View of Clamp.

it adjusted to a bowl with thin flange. The basin clamp proper is made entirely of sheet brass, and from its shape is very strong, while at the same time it presents a neat appearance. One of the most important advantages claimed for it is its adjustability, permitting its use with bowls having either thick or thin flanges, as shown in the illustrations Figs. 2 and 3. In changing the adjustment it will be seen that the plane surface of the clamp offers a flat bear-

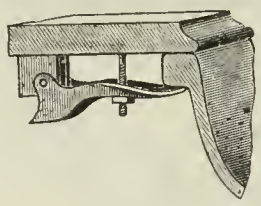


Fig. 2.—Clamp Adjusted to Basin with Thick Flange.

ing for the nut on a bowl to be tightened up against. The variation in the clamp is attained by the little yoke or U-shaped piece, as shown in Fig. 1, being hung out of the center. This allows of four different adjustments by simply turning the yoke with the fingers, and it will be seen that the change can be made instantly. The yoke is attached to the clamp in a substantial manner. Another feature to which the manufacturers allude is the length of the slit provided for the bolt,

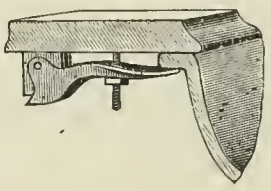
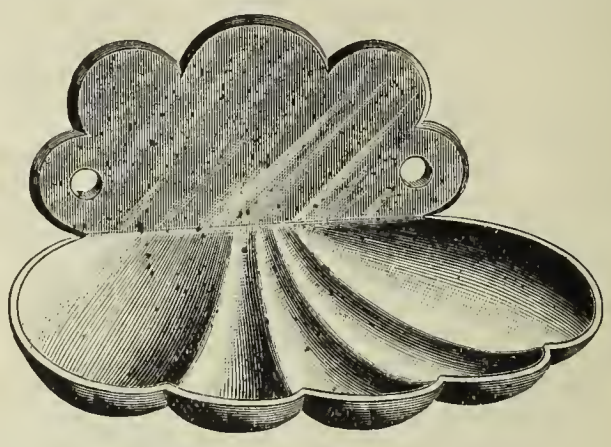


Fig. 3.—Clamp Adjusted to Basin with Thin Flange.

so that if a hole has been drilled out too far for the average basin clamp, as frequently happens with oval basins, the Sherman clamp can be used without trouble. It is pointed out that the adjustments can be made without removing the bolt from the clamp and in a moment's time. The clamp being always parallel with the marble, it is mentioned that it removes the liability of the bolt pulling out of the marble when the nut is tightened up. The Sherman Mfg. Company will send samples of these clamps free of charge on application.

The Columbus Soap Cup.

We show in the accompanying illustration a general view of the Columbus brass soap cup of a special patented design and made by the Columbus Brass Works, Columbus, Ohio. The design of this cup, it is said, prevents the bad odor or collections of dirt from the soap and water, which is a great source of trouble with cups having a false bottom. The cup illustrated can be cleaned by one stroke of the sponge. It



The Columbus Soap Cup.

is made of either polished brass or nickel plated and can be fastened to the back of any washstand with two small screws.

TRAPS AND VENTS.

McCahan & Co., 8 North Central avenue, Baltimore, Md., distribute circulars illustrating and describing some of their gas goods. One of the devices shown is the Surprise gas bath heater; also the Surprise gasoline portable bath heater.

The Gas Fitting Appliance Company, Newburg, N. Y., have moved into their new store at 62 Second street.

George Morlidge has opened a plumbing shop at 633 York street, Newport, Ky.

F. Lenox and A. Cleveland will open a plumbing shop at Hamilton, N. Y.

In *The Metal Worker* of March 9 appeared an article entitled "The Star Coupler on Supply Pipes" and an illustration was shown of the universal application of these couplers. We accidentally omitted to state, however, that they were manufactured and sold by the Star Coupler Company, 801 Wainwright Building, St. Louis, Mo. If the Star Coupler Company were not so well known to the entire trade the omission would have been more serious than it is.

The Western Gas Fixture Company, Toledo, Ohio, had a small fire last week.

The Board of Health of Detroit, Mich., have reduced the salary list of the city officials in their department from $45,054 to $23 300. To do this a number of employees had to be cut off, and several offices were abolished altogether. The number of sanitary inspectors was reduced from 16 to four, and the garbage department was abolished, throwing out the two inspectors and a clerk. Only one plumbing inspector was allowed, at a reduced salary, and no clerk. The office of sanitary expert was abolished, and it was not thought necessary to employ a stenographer. The salaries of most of the offices were reduced. The additions include a sanitary engineer, with six assistants, who will look after the inspection of food, milk, plumbing and sanitary regulations. The office of laboratory expert was also established.

A bill to license plumbers is on its passage through the Legislature of Wisconsin. It provides that no plumber or plumbing firm shall do business without a license, in any city having over 7000 inhabitants. Application must be made to the board of health, which shall appoint a board of examiners to examine into the qualifications of all applicants, and certify them to the board of health, which shall issue licenses good for one year. Fee $2 for employing firms, 50 cents for journeymen plumbers, 50 cents for renewals. An inspector of plumbing is also to be appointed, to be a person not interested in the business. Each city of 7000 or over shall also fix by ordinance regulations for plumbing and apparatus to be used, no plumbing except repairs to be done without a permit. Violation of the law is made a misdemeanor, punishable by fine not exceeding $50.

J. N. Hevey, Keene, N. H., has taken Walter A. Whitman into partnership in the plumbing and gas fitting business. The firm name will be Hevey & Whitman. The business will be increased by the addition of electric supplies of all descriptions.

John B. Kelly has opened a plumbing shop at 42 Front street, Ballston Spa, N. Y.

Thompson & Morrison, plumbers, Amherst, N. S., have been succeeded by C. A. Lusby & Co.

The Birney Plumbing Company have been incorporated at Chicago, with a capital stock of $3000, for general plumbing. The incorporators are C. R. Jones, William F. Henning and C. Woodward.

McCambridge & Co., Limited, Philadelphia, have just issued a handsome supplement of 24 pages to their catalogue B, descriptive of their Sypho closets and urinals. The publishing of the supplement was necessitated by the many additions to the line since the publication of the original catalogue. Many of the styles shown in the catalogue appear in the supplement. A feature of the new styles shown is the method of attaching the seat to the bowl. This is accomplished by means of a solid spindle passing through a sleeve at the back, and forming part of the porcelain bowl. This spindle forms a bearing for the seat mountings, and

makes a safe and durable fastening. The closets are all made of vitreous porcelain and are shown in plain and embossed patterns, with a line of tanks, ornamented and plain, automatic flushing seats, chain and guide pulls, pipes, straps and fittings. Page 11 shows a public toilet room equipped with Sypho closet and urinal. The urinal combination is shown to be of the automatic type, regulated to flush by means of an automatic siphon tank as frequently as desired. The urinal is further described on page 21, and its special adaptability for hotels and public places explained. Page 20 is devoted to Howell's flexible water closet connections, as used on most of the company's closets. Pages 22 and 23 are utilized for detailed pricelists of the different Sypho combinations, and the concluding page is occupied by the company's brass toilet paper cabinet, which commends itself as a finishing touch to the equipment of a modern first class bathroom. The supplement is about 14 x 10½ inches in size, and is bound in buff paper covers.

THE BILL for the registration of plumbers has been again introduced into the British House of Commons in the same form in which it failed of passage last yesr and in 1893. The prospects of its becoming a law in its present shape are regarded as being very remote. A strong opposition exists to it on the part of many ironmongers who combine a plumbing business with their own trade.

E. A. WEIDNER AND J. A. MERGANTHALER have dissolved partnership in the plumbing business at 230 Wells street, Milwaukee, Wis.

THE STOP COCK COMPANY, 50 Cliff street, New York, issue a neat little booklet entitled "Servants or Masters?" relating to an automatic appliance by which both the water and gas supply to a building can be shut off to prevent freezing, overflowing or other accidents occurring during the night.

THE DALTON-INGERSOLL COMPANY, 171 High street, Boston, Mass., are issuing their 1895 supplement to Catalogue "C." It contains 32 pages of fine ensmeled paper and first-class printing. The second page contains a notice that they will keep any of the water closets illustrated in it in repair for three years if they become inoperative through defect in principle or construction. The first 20 pages are devoted to showing their line of hand action siphon closet and their hand and seat action wash down closets. A sectional view is given of all the different closets showing their construction, also a cut of a floor and wall on which the dimensions are given of the space required to set them. Some of the closets are shown all earthen, others with an enameled iron trap. The bottom of the flush tanks for these closets is just level with the seat, and some are shown with the flush tank behind a partition, and it is stated that in public places the run of soil pipe can be shortened by arranging the closets in two rows with an inclosed space between for the flush tanks and piping. The Puritan enameled roll bath is next shown in connection with a combination needle and shower bath. This bath rests directly on the floor, having no feet. It is followed by several illustrations of combination needle and shower baths in connection with bathtubs and separate. Several styles of siphon tank valves and flush tanks are shown and some bath and lavatory combination fixtures.

THE NEW SHOWROOMS of the Gilbert & Barker Mfg. Company, 82 John street, New York, will be heated by a Champion boiler made by the Thatcher Furnace Company, 240 Water street, New York. The salesrooms are being opened to display their machines for the manufacture of gas and gas appliances for cooking, heating and manufacturing purposes, not the least interesting of which is the new Clark's instantaneous gas water heater.

DUBOIS & DARROW, 61 Gold street, New York, are closing out their plumbing supply business previous to entering into a manufacturing business in another field on May 1.

P. J. HART of the firm of Hart & Shea, plumbers and gas fitters, at 10 Putnam street, Fitchburg, Mass., will open a store at 353 Main street, in Central Block.

TAYLOR & HILBORN, Bucyrus, Ohio, gas fitters and plumbers, will remove about April 1 into the audience room of the old M. E. Church, which will be fitted up for their use.

THE WORCESTER MASTER PLUMBERS' ASSOCIATION, Worcester, Mass., in existence for several years, is now a thing of the past. The organization formally disbanded at a meeting held in the rooms of the Builders' Exchange last week. It was voted to pay all the debts of the association with the funds in the treasury, which are ample for the purpose, and then to sell all the association property, which is valued at about $200.

THE PLUMBING FIRM of Leslie & Wilson, West Lafayette, Ind., are moving into the room recently vacated by R. N. Goans' candy store.

GEORGE H. STICHTER, an old member of the Reading Baseball Club, has engaged in the plumbing and gas fitting business at 341 South Sixth street, Reading, Pa.

THE PLUMBING BUSINESS conducted by Harper & Westcott, at 27 Howard street, Albany, N. Y., has been dissolved by mutual consent, and Horace F. Westcott will continue the business. He is president of the Master Plumbers' Association of Albany, chairman examining board of master plumbers, and an officer of the State association.

KINGSLAND & Co., Burlington, Vt., plumbers and dealers in house furnishing goods, have disposed of their stock to the G. S. Blodgett Company and will go out of business.

Death of Alexander McKay.

Alexander McKay died last Saturday at his residence, 136 Canfield avenue, East, Detroit, Mich., aged 42 years. Mr. McKay was well known in business and social circles, being the secretary and treasurer of the Park-McKay Company, manufacturers of plumbers' supplies. He came to Detroit from Dutton, Ont., in 1869, and engaged in the plumbing business with Ferguson, Mouat & Co. At a later date he organized the Park-McKay Company. He was a successful business man. The deceased leaves a widow and two daughters.

It is stated that the International Pacific Cable Company, who failed to get a Federal charter from the last Congress, will go ahead with their project of connecting San Francisco, Honolulu, and Yokohama by cable, operating under a State charter.

News and Notes.

The insurrection in Cuba threatens to interfere seriously with the trade of that island.

During the fiscal year 1893–94 the sum of $3,342,375 was applied by the county and municipal councils in England, Scotland and Wales to the promotion of technical education.

The United States Minister at Madrid, Spain, has reported to the State Department that he has obtained from the Spanish Government an order for restitution in five test cases of claims for excess of duties paid by United States importers into Cuba.

Electricity, according to a Canadian Customs decision, comes under the head of "Unenumerated articles," paying a duty of 20 per cent. when imported into that country. The question recently arose over a proposition to transmit power from the American side of Niagara Falls to adjoining Canadian cities.

The Congress of the State of Nuevo-Leon, Mexico, has recently passed a law exempting from all taxes new industrial enterprises locating in that city in the next two years having a capital exceeding $1000. The exemption is to last six years, dating from the time when the capital shall be deposited.

A Philadelphia paper states that the Cramps of that city have a contract to build a 20 knot steel stesm yacht for an unnamed owner, which will be one of the finest pleasure vessels afloat. The dimensions given are 174 feet on the water line and 200 feet over all, with 23 feet beam and 11 feet draft, and 247 tons burden.

United States Immigration Commissioner Stump has prepared statistics showing that during the past seven months immigration into the United States has decreased 40 per cent.

The British Board of Trade returns for February show a decrease in imports of $28,080,000 and in exports of $8,208,000, as compared with those of February, 1894.

The fire losses of the United States and Canada for the month of February, as estimated by the *Journal of Commerce*, aggregated $12,360,200, an increase over the February figures for 1893 and 1894. The following comparative table exhibits the losses for the first two months during the past three years:

	1893.	1894.	1895.
January...	$17,958,400	$10,568,400	$11,895,600
February..	9,919,900	11,297,600	12,360,200
Totals..	$27,878,300	$21,866,000	$24,255,800

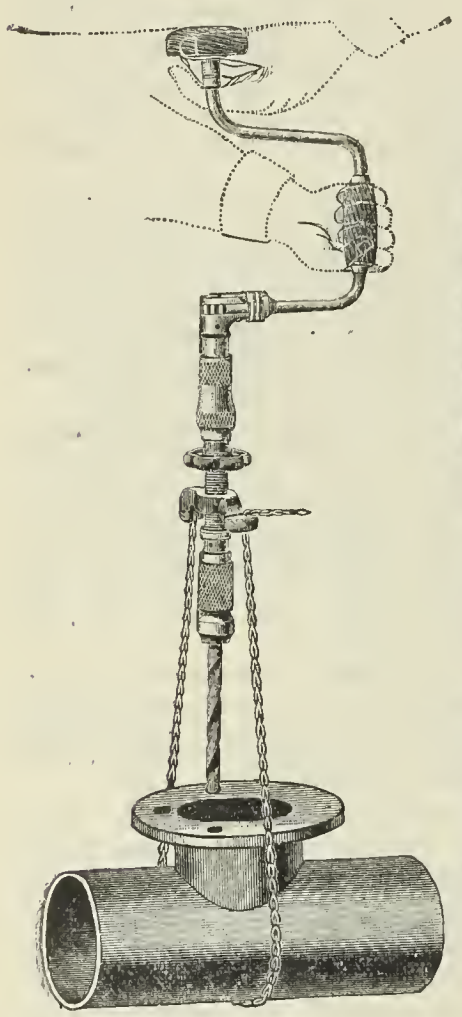
The lifting of the acute distress which has for a long time prevailed among the settlers in Western Kansas is evidenced by the fact that 12 counties have notified Governor Morrill that they are in no further need of outside aid.

It is proposed to connect Pittsburgh with McKeesport, West Newton and Greensburg by means of an electric trolley line. The Widener-Elkins syndicate, which controls so many street railroads, is said to be at the back of the scheme.

The explanation of a number of suspicious fires which have been occurring in the east side of New York City was found in the exposure and conviction of an organized gang of "firebugs," who were last week awarded exemplary sentences in State's prison.

The S. & W. Drilling Attachment.

We show in the accompanying illustrations the S. & W. drilling attachment manufactured by the Smith & Winchester Company, Boston, Mass., with New York office at 174 Fulton street. The simplicity of the tool is particularly referred to, and the illustrations clearly show its operation and usefulness. The drilling attachment is used in connection with an ordinary bit brace for the drilling of cast iron, steel, wrought iron or any metal which it is possible to drill by any means. The manufacturers allude to the difficulty of keeping a constant pressure where the brace drill is used. With the S. & W. attachment, however, it is stated that an inch hole can be drilled with great rapidity through metal of any thickness with no power from the operator except the mere turning of the drill. Fig. 1 shows the drill as it would be used in boring through the flange of an ordinary piece of pipe, and indicates clearly the manner of operating the drill. The device is simple in construction and consists of a spindle to one end of which is fastened the drill, and to the other end the bit stock. Outside of this spindle is a tube having threads on the outer side which pass through the yoke to which the chain is attached and which holds the drill to its work. Attached to this tubing is a small corrugated wheel, and as the drill enters the metal the wheel is turned sufficiently to keep the drill at its work. Excessive friction between the tubing and the spindle is prevented by 12 steel balls which reduce the friction to a minimum. Fig. 2 shows the drilling attachment separate as adapted for ½-inch round shank drills, and is classed by the manufacturers as Style A. Fig. 3 shows the same attachment with adjustable chuck for square shank drills and is known as Style B. These drills can be obtained from dealers throughout the country as well as from the Smith & Winchester Company.



The S. and W. Drilling Attachment.—Fig. 1.—Drill in Use.

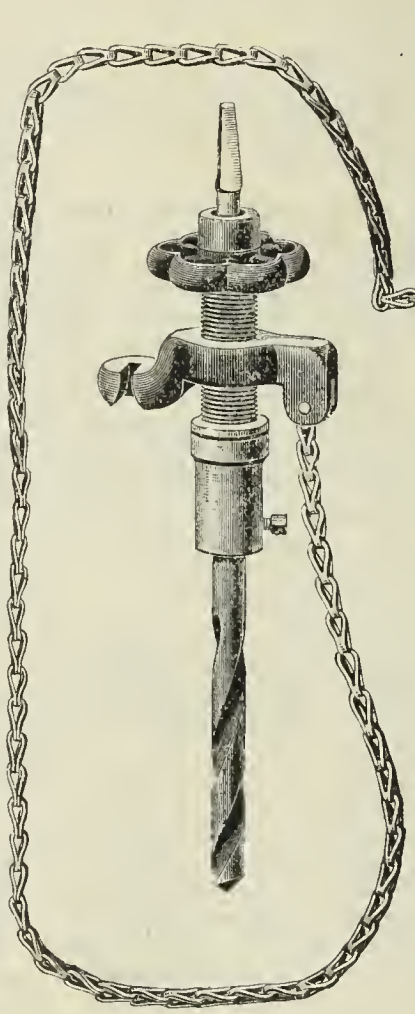


Fig. 2.—Drilling Attachment, Style A.

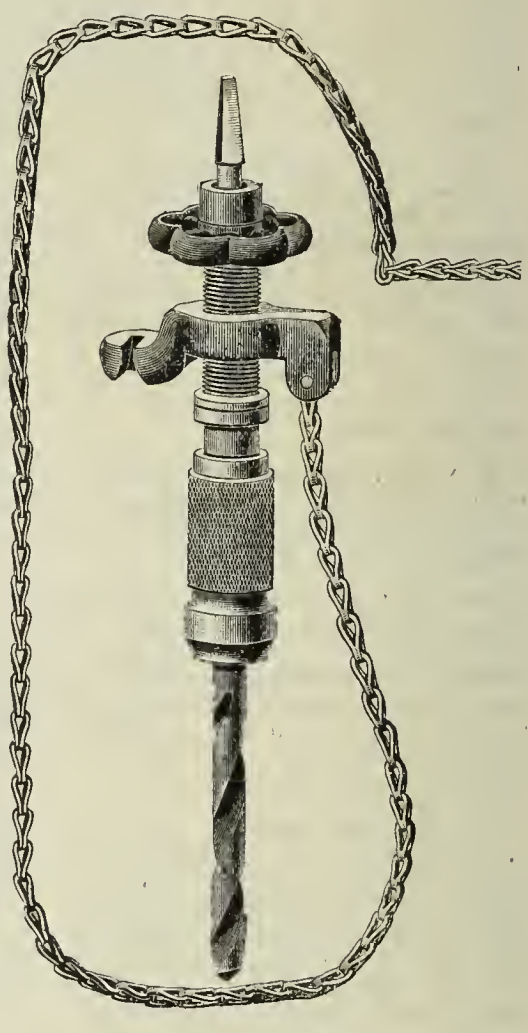


Fig. 3.—Drilling Attachment, Style B.

The new ship canal between the Baltic and North Seas is to be opened on June 20 by Emperor William of Germany with imposing ceremonies. A naval parade of vessels of war of all countries is announced as a leading feature of the programme. The canal, which has cost $37,440,000, was begun in June, 1887, and over 8600 men have been employed on the work. It starts at Kiel, on the Baltic Sea, crosses the province of Holstein and joins the river Elbe at Brunsbüttel, below Hamburg. The length is 53½ miles, average depth 29½ feet, width at bottom 72 feet and at water level 213 feet. There will be two locks, one at the Baltic end and one on the Elbe.

At the Charlestown Navy Yard, Boston, Mass., an important test will be made next week of the Ammen ram "Katahdin," to ascertain the vessel's metacentric hight; that is to say, to find out her center of gravity and point of water pressure. The test is regarded as being of the greatest importance, and it will be attended by naval authorities from Washington and representatives of the Bath Iron Works, where the ram was built.

A. B. Howard, Jr., chief of the Maryland Bureau of Industrial Statistics, in his annual report for 1894 shows a total of 7485 mechanical and manufacturing establishments in the State, with a capital of $119,667,316 and employing 107,054 persons. Baltimore possesses 5265 establishments, capitalized at $92,723,677.

The sanitary ware operators, who have recently reorganized for the purpose of resisting any further reduction in their wages, held a meeting at Trenton, N. J., which was attended by operative potters from Baltimore and Ohio, when the constitution and by-laws were adopted, the principal features of which are the obliterating of the individual contract system, fixing a uniform price for each piece of work and prohibiting the manufacturer from taking on any apprentices. The attitude of the men is stated to be very firm on the question of resisting what they consider further encroachments by the manufacturers.

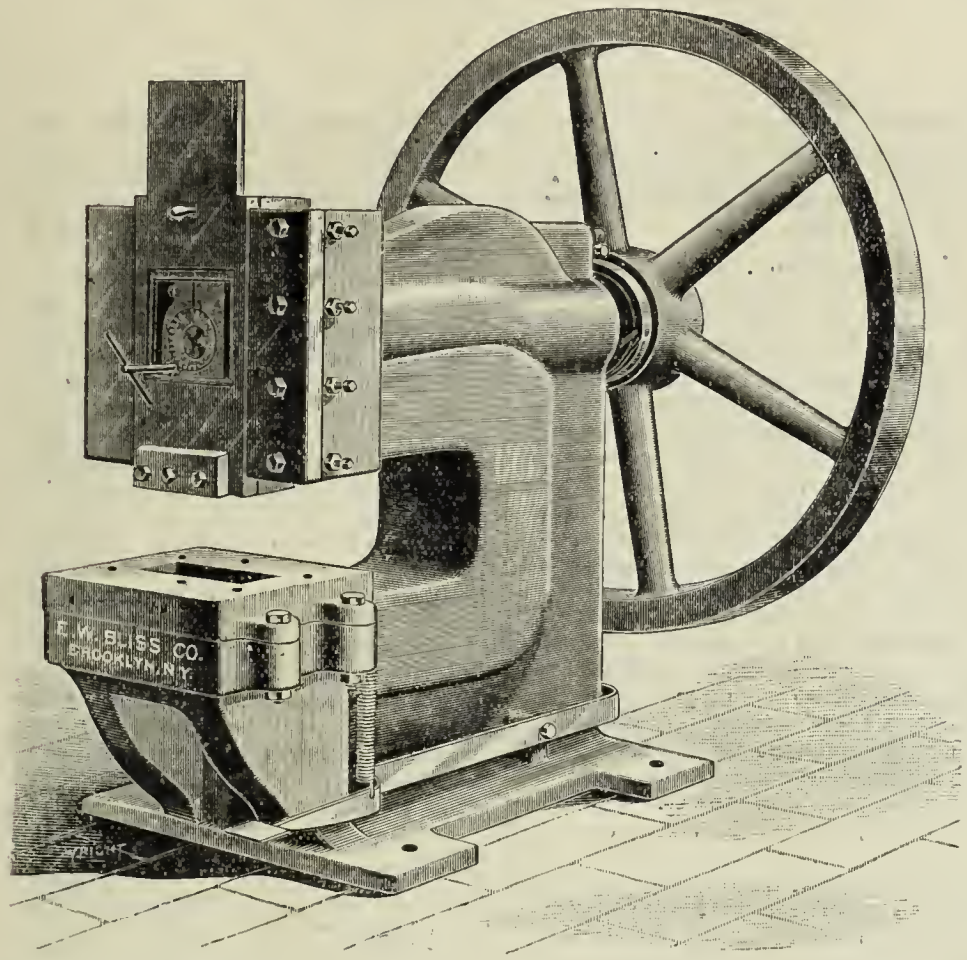
Lloyd's Register of British and Foreign Shipping shows that 22 British war vessels were launched in 1892, of 137,000 tons; 16 ships in 1893, 40,000 tons, and in 1894, 29 vessels, of only 32,000 tons. In the course of the last 12 months Russia launched 34,850 tons of war vessels and France 28,690 tons. Thus France and Russia between them nearly doubled the output of Great Britain last year.

A dispatch from New Haven, Conn., states that the Winchester Repeating Arms Company of that city made a shipment last week of 2,000,000 cartridges to the Chinese Government. The company are now said to be working on a large additional order for ammunition from that quarter.

The Bliss Deep-Throat Power Press.

Up to a comparatively recent period the use of deep-throat punches was almost entirely limited to the punching and shearing required in bridge, railroad and structural iron work, which does not often call for the accuracy and adjustments needed in working blanking, perforating or forming dies on thin sheet metals. Within the last few years, however, much of what had previously been done by hand in the production of stoves, wrought iron ranges, zinc work, &c., has been brought within the range of die operations, calling for a press which combines a deep throat with the necessary accuracy and adjustments. The press shown in Fig. 1 was designed by the E. W. Bliss Company of 11 Adams street, Brooklyn, N. Y., for this purpose.

Its punch slide is guided and gibbed so as to secure accurate cutting and is provided with an eccentric adjustment permitting it to regulate with precision and ease the exact point to which the punch is to descend. The exact nature of this eccentric adjustment is shown in Fig. 2. It can be brought into any needed position by simply turning the pinion wrench shown after having loosened the clamp bolt. The pressure is in this manner always taken on solid metal instead of falling on screw threads. The action of the press is controlled by means of a treadle which operates an automatic clutch, so as to insure the stopping of the slide at the highest point of the stroke. This machine is mostly made as a fly wheel press, but for work requiring a slower and more powerful action it is provided with back gearing. It is also frequently furnished with stay rods so as to fit it for heavier work where a great depth of throat is not needed. The principal dimensions are as follows : Depth of throat, 24 inches ; distance from bed to top of throat, 9¾ inches; motion of slide, 1¼ inches; size of bed, 16 x 16; standard opening in bed, 8½ x 8½; diameter and face of fly wheel, 54 x 5; weight of fly wheel, 900 pounds; speed of fly wheel, 90 revolutions; the complete weight of press, approximately, 5500 pounds.



The Bliss No. 78 Deep-Throat Power Press.—Fig. 1.—General View of Press.

The most destructive natural gas explosion in the history of the Indiana gas belt occurred at Anderson, Ind., at an early hour on the morning of March 5. An entire business block, situated on the Court House square in the center of the city, was literally blown to pieces, causing a direct loss of about $400,000. No satisfactory explanation as to the cause of the explosion is given. Fire followed the shock, but was kept within the limits of the wrecked block.

Paper Water Pipes.

The experiments with the new paper pulp pipes, which are made on pretty much the same principle as the fiber pail, have demonstrated to the satisfaction of the *Paper World* that the idea will eventually prove successful. As it now stands, the hand made pipes, formed from crudely worked and irregularly subdued pulp, are not very attractive in appearance nor well enough made to warrant that they will stand the wear and tear to which street water pipes are subjected. However, it would be more of a wonder if the plan of making the water pipes should be a booming success from the start. Time and experiments are essential to the development of all new things. With each new test of the proposed pipes a step in advance is made, and this would seem to indicate that after a few more trials perfection will have been attained. The matter as it now stands is about as follows: Paper pulp, in which there is a fairly good fiber, is agitated with water and run into molds and cast into the form of the ordinary water pipe. The same molds that are used in connection with casting iron pipes are employed. The mode of procedure is substantially the same. Of course there are various strengthening materials compounded with the pulp, otherwise it would not stand a great pressure. The inventors report that these ingredients are inexpensive and simple.

Owing to the largely increasing Pacific Coast traffic of the port of San José, Guatemala, the Government of that republic, says the Bureau of the American Republics, is taking steps to re-establish the old port of Istapa, situated about six miles from San José. It is proposed to construct a harbor there capable of accommodating about 100 vessels, and also to build a branch railway to the port from some point on the Central Railway, thereby relieving the condition of congestion which now prevails in the neighboring port.

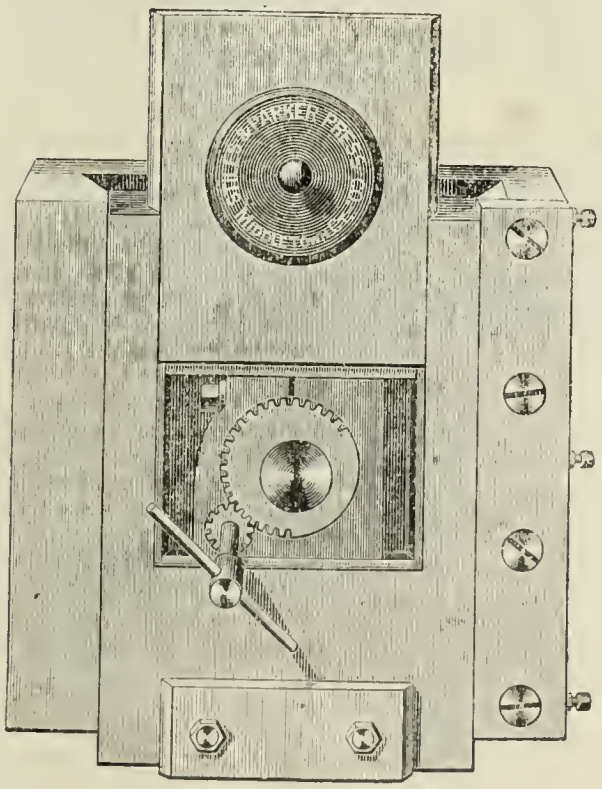


Fig. 2.—Eccentric Adjustment.

TIN PLATES.

SCRAP.

A DISPATCH from Alexandria, Ind., to the Cincinnati *Commercial Gazette* states that a tin plate factory is to be erected in that locality which will employ about 400 men. The plant is to be on a large scale, covering 216,000 square feet.

FOLLANSBEE BROS. COMPANY, successors to James B. Scott & Co., Pittsburgh, Pa., issue a seasonable circular with the rubricated head-line, "Spring is here." This prefaces the cheering statement that signs point to an improvement in business. The purpose of the circular is to call the attention of the trade to the various well-known brands of tin and terne plates which the firm handle. These include Scott's Extra Coated, Triumph Old Style, Orbit Old Style, Duquesne, Neville, Pittsburgh and Raymond roofing plates, and Blairsville best bright, Clifton, Conemaugh and furnace bright plates. Attention is also directed to their assortment of sheet iron and their stock of tinners' tools and machines.

REPORTS of projected tin plate plants are constantly being published, particularly in connection with various towns in the Indiana gas belt. While some of these are undoubtedly *bona fide* enterprises, we are advised that others are being promoted merely for the purpose of booming town lots. These items of news should therefore be taken with a certain amount of caution.

THE recent labor difficulty in the American Tin Plate Company's works, Elwood, Ind., when 50 men in the cold roll department struck for a change in the system of payments, has been adjusted by the company granting the request of the men, and 750 hands are reported to be now at work.

PLANS are reported to have been completed for a third tin plate plant at Ellwood, Ind., to be built by Chicago capital. Work will be begun on the buildings about the middle of April and the plant is expected to be ready for work by October. About 300 men are to be given employment at these works.

BRITISH CONSUMERS are complaining, through the columns of their trade journals, that while the prices of tin plates for export are lower now than at any former period, they are called upon to pay as much for their plates as they paid a year or two years ago, notwithstanding the fact that steel bars and pig tin are both considerably cheaper now than they were at that time.

N. & G. TAYLOR COMPANY'S tin plate plant in Philadelphia is reported to be working steadily, not having been affected by the ups and downs of the trade. The demand for their standard brands is such as to oblige them to increase their facilities. The firm, we understand, are now completing the erection of two new stacks, which they expect to have working within a week. Notwithstanding the exceptionally hard winter, which has its effect upon tin house work, the Taylor plant has been running steadily, with the assurance of a good business for their goods the coming season. The company advise us that their genuine Taylor Old Style roofing plates are increasing in sale, as the old roofs covered with this brand testify to its durability.

E. E. ERICKSON, Pittsburgh, Pa., has a contract to erect a new tinning stack for the Pittsburgh Tin Plate Company, New Kensington, Pa.

THE WELSH TIN PLATE MANUFACTURERS seem to be still hankering after an agreement whereby they can arrange to materially advance the price of tin plates. The *Iron and Steel Trades Journal* of London intimates, however, that it is the owners of tin plate works in Wales, who are also interested in American works, who are endeavoring to entice the Welsh makers to combine to raise the prices. There is, however, a strong feeling against those who have these dual interests, and the Welsh makers are, on the whole, inclined to agree that their best friends are not those who are interested in the American tin plate industry.

THE BRITISH BOARD OF TRADE RETURNS for February show that 33,000 tons of tin and terne plates were exported from Great Britain during the month. Of this amount 23 000 tons were shipped to the United States, against 18,000 tons in the previous month and 13,000 tons in January, 1895.

THE FRANK-KNEELAND MACHINE COMPANY, Pittsburgh, Pa., manufacturers of iron and steel works machinery, have received a contract from Reeves Iron Company, Canal Dover, Ohio, for four double tin mills with 24 x 30 inch rolls, four cold mills 22 x 34 inch rolls, two doubling and one trimming shears.

THE PLANT of the Crescent Sheet & Tin Plate Company, Cleveland, Ohio, is nearing completion and is expected to be ready for operation about May 1 next. At the start out the concern will make black plates, although a tinning department will be added later on. The plant will cost, when completed, about $150,000, and is expected to turn out about 20 tons of black plates per day. The hot mill will be 175 x 75 feet, and will be driven by two engines, 34 x 72 inch. There will be a 10-ton and a 5-ton electric crane and other machinery, including a dynamo. The tin house will be of steel construction, 105 x 165 feet, with a wing 48 x 48 feet. It will contain ten tinning stacks. The annealing house, with pickling machines and other equipment, will adjoin it.

THE tin plate manufacturing firm of Griffiths & Cadwallader, Pittsburgh, Pa., have been dissolved, and the business is being continued by C. W. Cadwallader.

THE NEW PHILADELPHIA IRON AND STEEL COMPANY, New Philadelphia, Ohio, manufacturers of black and galvanized iron and steel sheets, are making important improvements in their plant. Until the middle of January this concern were operating four hot sheet mills with a large Corliss engine, which worked satisfactorily when rolling iron sheets with 22-inch diameter rolls. Large orders for steel sheets of the finer gauges have constantly been coming in, and the firm have decided to double their power, and are now putting in a pair of 32 x 48 inch Geo. H. Corliss engines, a new and heavier fly wheel, two sets of steel gear wheels, a set of 24-inch rolls, and will considerably increase their cold rolling capacity. The New Philadelphia Iron and Steel Company have six hot sheet mills, two cold rolling mills, bar mill and galvanizing plant. Two of the sheet mills and the bar mill are running right along, and will be kept in operation during the time the improvements and repairs are being made. They are operated by a pair of poppet valve engines. An electric crane and lighting plant are also being added. When the improvements are completed, which is expected to be about May 1 next, the plant of this concern will be one of the best equipped in the country, and when running to its full capacity will be able to turn out about 1400 tons per month of iron and steel sheets from No. 12 to No. 30 gauge and suitable for all purposes.

A NUMBER OF IMPROVEMENTS have recently been made in the plant of the Falcon Iron & Nail Company of Niles, Ohio, manufacturers of iron and steel sheets. A continuous rolling mill has been added to the equipment.

THE STAR TIN PLATE COMPANY, Pittsburgh, Pa., have made application for a charter of incorporation. The incorporators are: James Hemphill, William Wade, Pennock Hart, William F. Dutton and Joseph Fawell. The plant of the new concern will be located on Twelfth street, below Penn avenue, Pittsburgh, Pa. The foundations for the hot mills have been under way for some time and are almost completed. The concern will erect eight hot mills and they will be driven in pairs. Three pairs will be driven by 42 x 60 inch automatic cut off engines and the other two hot mills will be driven by a 28 x 48 inch Corliss engine. There will be six cold mills, and these will be driven by a tandem compound engine with 28 inch high pressure cylinder, 50 inch low pressure cylinder and 60-inch stroke. There will also be the necessary annealing furnaces, shears, pickling vats, &c., and it is expected to have the plant in operation on the manufacture of black plates for tinning purposes about July 1, with a capacity of about 50 tons of black plates a day. It is the intention of the firm to add tinning sets later on and to engage in the manufacture of both tin and terne plate.

H V. B. NASH of the tin plate firm of T. B. Coddington & Co., 27 Cliff street, New York, left for Europe last Saturday on business connected with the estate of his father, the late Henry Nash of Liverpool, whose sudden death was recorded in these columns last month. Mr. Nash expects to be absent for about a month.

THE MONTHLY STATEMENT of goods in bonded warehouse in New York City shows that 66 940 boxes of tin plate were so held there on February 28, as compared with 76,353 boxes on the same day last year.

STOVE TRADE NOTES.

Foundry Mixtures for Stove Castings.

The most economical and serviceable mixture of irons is the great point sought by the foundry manager. In this matter experience is worth a great deal, but the experience of any single manager is not nearly so instructive as would be the experience of many msnagers combined. In the hope of securing information from some of the practical men connected with foundry management we print below a letter recently received from a stove manufacturer who has had trouble with his foundry mixtures. The difficulty may be due to the proportions of different irons which he has used. We know that he would be much indebted to any one who could suggest wherein the difficulty lies, and we know the trade would be greatly interested in a discussion of the proper mixtures for stove castings. We print his letter as it is received:

We send herewith a mixture of iron which we have been using without good results, and we would be very glad if some of your practical readers would suggest a remedy. The mixture is as follows:

Thirty-nine per cent. of the pig iron charge is good grade No. 2 Southern Foundry.
Thirty-eight per cent. of the pig iron charge is good grade No. 3 Southern Foundry.
Sixteen per cent. of the pig iron charge is good grade No. 1 Southern Soft.
Seven per cent. of the pig iron charge is Jackson County Silvery, carrying 8 per cent. silicon.

As a matter of course, all of the Southern irons are of different brands. By that we mean they come from different furnaces. With the above we use our own scrap, and with each ton of iron charged we add 30 pounds of limestone as flux. This mixture makes an iron that hss a great deal of dirt in it, and aftcr the iron is melted and in the ladle there is a quantity of dirt that rises and has the appearsnce of rust. It is not slag; it simply resembles rust, and it is impossible to skim this away, for as fast as one lot of rust is skimmed there is another lot which takes its place. When the iron is poured and any of this rust gets in the mold the result is a rather mean appearing casting. I would like to know what to do to clean this iron and to do away with this rust dirt.

AN INTERESTING FIGURE passed away this week in the person of John L. Gill, one of the pioneers of the West, who died in Columbus, Ohio, at the age of 90 years. In the year 1827 he took four six-horse wagon loads of stoves to Athens. On the trip he observed a blacksmith using coal which, on inquiry, he found to have been dug from the adjacent hills. Gill made arrangements with the blacksmith to dig sufficient coal to load the teams on their return trip, which coal he sold on arrival at Columbus at the rate of $15 per ton. This was the first coal ever brought to Columbus for manufacturing purposes from the Ohio Valley, and was the beginning of the immense coal industry of that region.

Gasoline Stoves.

The gasoline stoves that are being marketed this year are more attractive in construction than formerly, and now that their operation is simplified and their use is fully understood it will not be surprising if the year closes with the announcement of the same increase in sales as has been customary. The intense heat of which they are capable has been very pleasing to the always busy housewife, and their efficiency is reported and witnessed with an interest that makes the possession of a gasoline stove a mere matter of time in numberless cases. Like all apparatus of high power their misuse is capable of destruction, but modern improvement has reduced the danger to a minimum. As a farmhouse and suburban apparatus for summer use its popularity is undivided in many sections. Some discouragement has been met through the insurance companies, but liberal and up to date business companies will include the right to use gasoline stoves of approved construction in their policies. The season for their use is not so far removed that the live dealer can put off selecting his line, and the outlook is far more promising than for the past few seasons.

Brand's Catalogues.

The Brand Stove Company of Milwaukee, Wis., and 77 Lake street, Chicago, have just issued two handsome catalogues, one referring to oil and gasoline stoves, oil snd gas ranges and oil heaters, while the other treats exclusively of furnaces. The goods enumerated in the first catalogue cover Brand's Famous gas range, which is made in two sizes and is constructed entirely of cast iron; Famous Junior gas stoves and hot plates with one, two and three burners; Famous oil ranges, with four 8-inch cooking holes; Famous oil cooks, with one, two and three cooking holes, in various styles; lamp stoves with one, two and three burners; Famous All-Right oil heating stoves in three styles and sizes; Famous gssoline stovcs, comprising low juniors, high juniors snd high juniors with step, all having individual burners, and the same styles with single generators, either with stationary, safety or laydown tanks. It will be seen from this statement that the company are well equipped to supply the trade with hot weather cooking apparatus.

Their furnace catalogue illustrstes and describes a larger line of warm air furnaces than ever before shown by the company, to which they have added combination warm air and hot water heaters. Their furnace department has now been expanded into a specialty. The construction of the company's well-tried Wisconsin csst iron furnace is fully set forth, followed by the new construction with steel radiators, and a large number of wrought iron cylindrical flues to increase the heat radiating surface. Another new series of furnaces is named the Famous Florida. This is a base heating furnace with a steel dome and low radiator, increasing the distance traveled by the products of combustion, and securing the utmost amount of heat from the fuel burned. Other furnaces shown are the Famous Comet, with steel dome. and the Famous Magnet for wood. An illustration is given of Bigley's patent hot water heater, designed for the conversion of warm air into combination furnaces. This hot water heater is cone shaped, sits on top of the fire pot, is made of csst iron in two pieces, and presents the appearance of open pipe work, the interior being arranged with partitions between heads so as to cause reverse circulation of the water passing through the heater. It is tested to 150 pounds pressure, hss two inlets and two cutlets, and is intended to add to the heating capacity of a furnsce with little additional expense for fuel.

Florida as a Market for Heating Stoves.

BY JEEMS.

I was down in that flowery land during what they call the "second freeze," and part of the time was domiciled in one of those lovely Southern houses filled with all the Southern appliances for keeping warm, or, at least, for keeping out the warm, and in doing the latter the house was a perfect success. No warm ever got near that house, for the air froze before it struck it, and came into the rooms in regular ice chunks. I always was, and ever will be, the lover of a good stove, and when you have got the institution glowing on a cold day, and you feel its genial warmth while the wind howls outside and the pedestrians buck along against the blast, you feel how much you are thankful to the thoughtful stove man.

I never before had such a chance to enjoy the luxury of an open fire—the pretty tile, the tasty mantel, the finified brass trimmings and then the cheery blsze, as they called it. Great Scott! I bet I had a blaze in that chimney 40 foot high. Me and another nigger took regular watches to see that the cheery blsze was kept up. We had a dead sure thing on the blsze, but the heat we got out of it had no effcct on this "second freeze," as the fire froze from its effects.

Standing with my back to the fire, and clad in a long ulster, I had to tie a sash weight to the tail of the ulster to keep it out of thc blaze, the suction was so strong. How I did long for the stove around the boss' shop!

The reputation of Florida as a winter resort, free from all the rigorous accompaniments which attend the sort of weather that the North gets during the period that the stove men reap their harvest, I should imagine is rather shaky.

There ought to be a big business done in stoves through Florida next winter, for if ever a people needed them the inhabitants of this sub-tropical region do; and if a lot of hustlers started a house-to-house canvass and expatiated on the great advantages of the good old stove and the danger of freezing to death if they have another freeze, a tremendous business could be done. Every orange tree, or at least every three trees, ought to have a stove all ready to light when the sub-tropical winter sets in, for the truth is a sub tropical winter is a corker and not favorable to the orange crop; but with the stove attachment orange growing would be a success. The sub-tropics is the outlet for the stove surplus. Think of it! There must be a million or two of orange trees, and a half million of people who need stoves—that's about the size of it—and there is at least a million stoves wanted. "There's millions in this scheme" for stove foundries and a big field for the inciters of public interest in them.

The sea trip from New York is a very pleasant one when it is "smooth all the way down just like the North River." When it isn't, and usually it isn't, it is not so pleasant. It is like fishing; "if you had been here yesterday you would have struck luck," so the boatmen tell you. So with the steamer—"last trip was as smooth as glass, but this is the worst we ever had." So you take the chances on the briny, but as a mine of information on diseases and oranges the Florida steamship is the place to acquire instruction. Most of the passengers are going down for their health or to look after their orange groves, and between pukes, if they are seasick, they will load you up with a detailed account of their ailments or give full instruction regarding orange growing. It is really delightful to get into one of the medical groups and hear of the wonderful remedies and the cure alls that are recommended; then the doctors' bills; how much each has paid and how good or bad their doctor is, &c., &c. It is so pleasant to hear people describe all their agonies and what they endure, and it is astonishing how they will prolong the narrative to make it interesting for you. It is about as amusing as the dentist when he is running a machine shop in your mouth. Then they all have their prejudices as to the healthiest districts in Florida, and I should judge by what I heard that 300 or 400 yards difference in location would kill or cure a person, according to how he struck it.

The orange fiends are just as bad, for their ideas differ largely regarding this fruit and the best method of culture. As I had no disease or orange groves, and in fact don't care about either, I escaped from the crowd as much as possible, and made friends with the cook, getting points on his art when the weather was smooth.

But there is one thing to be said for Florida, and it applies to the South generally. People who will take Northern comforts and fit themselves for unpleasant weather can be as comfortable as they could wish, and while tropical agriculture may not be a sure thing (except with the stove attachment), other crops can be made. Up around Quincy and Tallahassie tobacco raising is carried out on a large scale. The Owl Cigar Company of New York have some 1800 acres of land at the former place, and are raising a fine grade of tobacco. They have a large cigar factory and heavy capital invested in the enterpise. Fuller's earth has been found by them, and is being mined and shipped North. This earth has always been imported, and no doubt exists but what there is lots of it in Florida. The climate is healthy, soil good, ground high and rolling, good water and living and land cheap in this section. Eggs 15 cents per dozen, chickens 25 cents, turkeys 75 cents each, dressed hogs 6 cents per pound, &c. Quincy has just contracted for water works, as they have an excellent quality of water. When you consider the vast quantity of well watered land that can be had for a nominal price, and think of the immense Western irrigation schemes to bring land under cultivation and the cost of such projects, it is surprising that the course of empire is not more southerly. Ocean voyagers usually go in raptures at the beautiful bay of New York, and think how charming it looks as they sail up the bay. I thought so, too, when I saw the ice floating around, the hills crowned with snow and the nice snug looking houses all fixed up with good heating appliances, and in fancy I could see the people sitting around the good old stove; yes, I could imagine the family cat and the family dog dozing around and enjoying its comforts; it made one feel very jolly, and to think of giving up these good things for a winter in Florida! In the language of the minstrel, "How foolish!"

The Rockford Grate.

The Rockford Grate Company of Rockford, Ill., are offering the trade an interesting assortment of grates of rich and artistic design, all of which we understand are copyrighted. This grate has interchangeable parts, so that either a shaking or dumping grate and any frame or summer front desired can be used. The back is cast in one piece, but the top and dampers are removable. This, it is claimed, prevents cracking from intense heat, while the parts can be readily replaced if for any reason such a course should become necessary By means of double flue chambers all difficulty with the draft is claimed to be avoided, and as the coal front is double all ashes and cinders fall through the space between them to the pit behind the ash screen. This is a feature which cannot fail to be appreciated by careful housekeepers, especially if they have had experience with grates from which the ashes were scattered over the hearth. The grate is regulated much the same as a stove, and as the designs are rich and artistic they form a pleasing addition to the appearance of the rooms in which they may be placed. In Fig. 1 of the accompanying illustrations we show what is known as the



The Rockford Grate.—Fig. 1.—Front View of Grate No. 203.



Fig. 2.—View Showing Construction of Shaking Grate, Brick Sides and Back, and the Double Draft Dampers Closed.

company's No. 203, measuring 30½ inches wide and 30¼ inches high. The frame is made in one piece and the back and sides are of fire brick. It has a double damper in front, a double basket front and an adjustable summer front. In Fig. 2 we present a view with the front removed, showing the construction of the shaking grate, the brick sides and back and also the double draft dampers closed. We understand the Rockford grate is offered to the trade as a decided improvement upon the old style, and one that overcomes many of the objections often urged against open grates. All the parts are fitted and put together at the factory. and each grate is boxed ready to put in position.

ODD PLATES.

A VARIETY of elegant mantels and fire places are on exhibition at the showrooms of W. Jackson's Sons, 246 Front street, New York. Mantels are exhibited that have been specially designed for use in halls, libraries, parlors and chambers and adapted to all styles of architecture. They are made of oak, ash, maple, curly birch and some finished in white and gold. Some are shown with beveled French plate glass mirrors, and others, very handsome, are built of tile, red earthenware and terra vitrea, plain and with deep recesses above the fire place bordered with artistic wrought iron or castings of iron and brass of appropriate design. The mantels serve to show seemingly unlimited styles of fire places and grates for coal, wood and gas, some fitted with andirons and others with logs and baskets. Some of the fire places are lined castings bearing ornamental designs of conventional, artistic or special character. Others are built entirely of tile, affording an opportunity for a grace of contour and a considerable license in coloring. Onyx, Sienna and Rose Numidian marble and glass mosaics are used as borders for the fire places with splendid effect, and having ornamental bands of brass and iron. The fire baskets and portable grates are adapted in style and ornamentation to their surrounding; some lusterless, others bronzed and plated or of cast brass or wrought iron. The andirons are in themselves a fine show, wrought iron being worked into fantastic shapes and into dragons or in rugged simplicity; brass is used cast, spun and stamped, highly polished or in antique finish in different colors and sometimes gold and silver plated. The shafts are made round and square, straight and taper, plain and fluted, and of onyx and marble surmounted by wreathes, urns and various ornaments. The fenders are of equal beauty and unlimited variety. The fuel holders, hods and fire sets seem too handsome for use. The summer pieces for fire places are art castings, "A Japanese Minstrel" and "Sans Souci" being notable. The gas grates and logs make a fire place an unalloyed pleasure and are in keeping with the other lines, which make a visit to the showroom something to be undertaken by every one who is able to do so.

THE FERROSTEEL COMPANY, with office and warerooms in Cleveland and with foundry at Chagrin Falls, Ohio, have issued a rather unique pamphlet entitled "Blue Book for the Register Trade." It consists of a number of pages of varying shades of blue printed in blue ink and bound in deep blue covers with embossed side title in old gold. The matter consists of illustrations and price-lists of Ferrosteel warm air registers and ventilators, numerous designs being shown covering Moorish, Byzantine and Composite Lattice patterns. All styles of registers can be supplied finished in white or black japan, electro plated in nickel, copper, bronze, silver, brass and solid brass or bronze metal. The company carry a large and well assorted stock at their warerooms, 17 and 19 Long street, Cleveland. They request that all correspondence be addressed to them at 106–108 Superior street. Cleveland, Ohio, where are located their main offices.

THE BELLAIRE STOVE COMPANY of Bellaire, Ohio, are now running their works four days a week instead of three as previously.

T. B. HUSSEY & SONS of North Berwick, Maine, are very busy getting out goods to meet the spring demand. Owing to the fire which destroyed a portion of their plant, manufacturing operations were checked to some extent, but the work of erecting the new buildings is being rapidly pushed forward and it is expected that everything will be running smoothly in a short time.

THE LEXINGTON STOVE FOUNDRY, at Lexington, Ky., resumed operations on Thursday, March 7, under the management of assignee O. W. Snyder.

THE PENINSULAR STOVE COMPANY of Detroit, Mich., favor us with circulars illustrating their line of wrought steel ranges and also their Silver Peninsular and Bronze Peninsular ranges, the last two being entirely new constructions and brought out to meet the popular demand for satisfactory goods at low prices. They are made for burning wood and are offered the trade in a number of sizes and styles. Each stove has six boiler holes and the ornamentation is of an attractive character. The company have recently established an agency for their furnaces in the western part of the city under the management of Samuel J. Genilloz & Co., 1330 Grand River avenue, Detroit, Mich.

THE PLANT of the Cortland-Howe Ventilating Stove Company, at Cortland, N. Y., has resumed operations, after the usual shut down for repairs and inventory.

THERE is said to be some prospect that the foundry of Burdett, Smith & Co., at Troy, N. Y., will resume operations this spring. It has been idle all winter, but trade has been improving in different parts of the country, and it is now thought that the stove foundry will soon be started again.

THE STANDARD RANGE & STOVE COMPANY were formed a short time since at Terre Haute, Ind., with a capital stock of $50,000. The meeting was held in the store of the Townley Stove Company, at which time officers and directors of the new concern were elected. The purpose of the new organization is the manufacture of stoves and ranges on a large scale. What is known as the old King plant will be utilized for a time, but subsequently the works will be enlarged, as the company own several feet of ground not yet built upon. It is also stated that if the demands of business should warrant it, a new site will be selected and a large foundry erected. The Board of Directors consists of H. P. Townley, E. J. King, M. J. Hynes, B. G. Hudnut, William Donoghue, George S. Zimmerman and S. L. Fenner. The directors then held a meeting and elected H. P. Townley president; E. J. King, vice president; M. J. Hynes, secretary, and W. E. Donoghue, treasurer.

THE CRAIG REYNOLDS FOUNDRY COMPANY of Dayton, Ohio, and with Western branch at 82 Lake street, Chicago, Ill., have just issued an interesting publication, entitled "The Triumph Estimate Book." It is issued for the use of the trade and in the hope that it will prove of service in keeping a more systematic record of estimates on furnace work and data connected therewith. Among the opening pages we find some remarks relative to estimates and adjustments, sample blank of proposal and specification for furnace work, together with tables showing the sizes, weight, dimensions, capacities, &c., of the various kinds of Triumph heaters made by the company. Some of the pages of the book are ruled in such a way as to cover the various items necessary, while other pages are left blank for memoranda. The volume is arranged with a great deal of care and seems to meet a pressing need of the trade.

THE SPEICH STOVE REPAIR COMPANY, who were recently formed at Milwaukee, Wis., with a capital stock of $50,000, have the following officers: President, Albert Speich; secretary and treasurer, Jesse C. Bradley. The new concern succeed to the business formerly conducted by Albert Speich and Speich & Bradley, both of whom dealt in stove repairs and stoves. The new concern will occupy a five story double store at 130–132 West Water street, and we understand it is their intention to largely increase their facilities so as to make the company one of the largest in the country in their particular line.

THE JOLIET STOVE WORKS of Joliet, Ill, are calling the attention of the trade to Moore's air tight heater and Moore's Extra cook stove by means of prettily decorated blotting pads. These are printed in colors and carry, in addition to advertising matter relative to the goods named, a calendar for the month of March.

THE ROCKFORD GRATE COMPANY of Rockford, Ill., began business a short time since, manufacturing artistic fire place furnishings. They first turned their attention to coal grates and have already brought out quite a large line of fine grates in which many improvements have been made on the ordinary club house grate. They have just issued a neat catalogue of 16 pages illustrating the several styles thus far brought out. The company are now at work on a line of gas grates.

CHARLES NOBLE & CO., Philadelphia, are putting on the market several new ranges of handsome design and replete with modern conveniences. The Home Liberty is an elevated boiler range especially adapted to the requirements of builders. It is supplied in portable and brick set patterns with right or left hand ovens and fire boxes, with or without pipe shelf, upper and lower warming closets and attachment for heating upper rooms. The Prize Liberty is similar in most respects to the Home Liberty, but is particularly for use with a vertical boiler. The Best Liberty is another range of the same order, but designed for a brick setting. All these ranges are supplied with either five or six holes, open or closed ends, and, when required, with skirt base and feet. The firm are improving their well-known Iron King range by the introduction of a bracket reservoir, and the old style reservoir attachment is being ornamented to harmonize with the oven door.

BEARING the ever defiant rooster on its red cover, a 32 page catalogue reaches us from Sam S. Utter, 113 Beekman street, New York. It is printed in blue and the introductory is characteristic. The first 18 pages are devoted to the Game and Summer Girl lamp stoves, followed by a page on the musical line, Solo, Duet, Trio and Quartette lamp stove. Then comes the New Game cast iron cooking stove with two, three and four hole tops, heating drums and ovens, with the Bantam Game and the Parlor Game oil heaters. Several pages are devoted to the Game gas hot plates and sad iron heaters. The last pages show Sam S. Utter's patent wick tube, which is msde in one piece without a seam, and give directions for using oil stoves to get the best results.

REEVES & SMILEY, 129 North Second street, Philadelphia, have been appointed sole selling agents for the stoves and ranges made by the Plymouth Foundry Company for the States of Pennsylvania, New Jersey, Delaware and Maryland.

A FRENCH CONSULAR REPORT from the Cape of Good Hope states that gas stoves are being largely adopted in that colony in every place where gas is available. There are about 800 now in use in Cape Town.

"A FEW Natural Gas Burner Facts Worth Considering" is the title of a little pamphlet from the Hollands Mfg. Company, Erie, Pa., giving cuts and descriptions of 74 different sizes and designs of gas burners for use in cooking and heating stoves and hot air furnaces.

THE EXCELSIOR MFG. COMPANY of St. Louis, Mo., have just brought out the New Charter Oak four-hole cook stove, of attractive ornamentation and substantial construction. It is provided with wire gauze door, but the arrangement is such that it can be changed from gauze to solid door by simply closing the gauze by means of a fan shaped register or sliding plate. This scheme of construction permits the air to be admitted into or excluded from the oven at pleasure.

A. L. CANFIELD, at Pearl and Beekman streets, the New York manager of the Danville Stove & Mfg. Company, Danville, Pa., is making a display of seasonable goods in the line of Monarch gas and gasoline stoves. The Royal Monarch gasoline stove is of the cabinet style with a drop oven door and a special adaptation of the new process burner. Their No. 14 Monarch is a family stove of the single generator type, and has a special feature in a subflame under the generator burner. After the stove is once lighted the sub flame can be put out, to be lit again when the regular burners are shut off. The subflame then consumes a small quantity of fuel, keeping the generator warm ready for lighting the burners at any time. The Royal Monarch gas stove presents a handsome appearance in a black japan body, which is brightened with heavy bands that are polished and nickel plated. The burner of this stove presents some new features similsr to those, it is said, used in the construction of the central draft lamps. Another feature of the burner is the construction of the needle valve governing the supply of gas. The tapering needle point does not taper all the way to the full size of the valve rod, but tapers more sharply and ends in a shoulder. This shoulder fits up against a seat and prevents the opening around the needle point from becoming enlarged by frequent use.

RATHBONE, SARD & Co. have been running their stove works at Aurora, Ill., on full time, with a full force of hands, since March 1. Prior to that date they ran on part time with a reduced force. This resumption of activity shows considerable faith in the future.

B. W. DODSON, who was for years a prominent and very popular member of the stove trade, is now secretary and treasurer of the Geneva Washed Gravel Company, Ogden Buildlng, 38 Clark street, Chicago.

THE DETROIT VAPOR STOVE COMPANY have been incorporated at Detroit, Mich., with a capital stock of $150,000. Incorporators are John S. Sherman, Edwin G. Mummery and George H. Harms.

THE HEALD FARQUHAR FURNACE COMPANY have incorporated at Des Moines, Iowa, with a capital stock of $10,000. Incorporators are W. J., A. W. and I. Heald.

WILLIAM H. SARD, vice-president of Rathbone, Sard & Co., has abandoned Chicago temporarily and will take a few weeks' vacation in Florida to recuperate after a severe struggle with the "grippe."

KIECHLE, BRENTANO & OBERDORFER, proprietors of the Southern Stove Works, at Evansville, Ind., have adjusted the labor troubles in their works and everything is again running smoothly. According to an interview with August Brentano of that firm, published in a local paper, the difficulty originated in January when the molders refused to work on a Franklin stove which they claimed was a "strike" job. All but 11 stood firm when the issue was finally presented to them to go to work on this stove or leave the premises. Non-union men were then employed, and the 11 old hands were so harsssed by the strikers that they were obliged to quit. The works then ran wholly non-union. On the 4th inst. G. F. Valentine of San Francisco, vice-president of the International Molders' Union of North America, called on Mr. Brentano, and after a thorough discussion of the situation a method was found through which the differences were adjusted. Mr. Brentano says in conclusion: "The matter is now settled to the firm's satisfaction in every detail. The firm are in far better condition in regard to their rights and privilege in our works than we were before the strike occurred. We now know what we sre doing. Heretofore our employees ran our business, and hereafter we will run it ourselves and to suit our own fancy and in accordance with the new management. You might add that we will have nothing to do whatever with the local union. Our contrsct is made solely and directly with the International Molders' Union of North America. The union men have paid all the non-union men's transportion out of the city, or taken them into the union. The union force will work for us commencing Monday morning. I engaged 50 molders to-day, including the 11 who stood by me in time of need. There is no reason why these men should not continue their work, as Mr. Valentine admitted to me that the men, our employees, alone were in the wrong."

THE FERGUS FALLS SHEET METAL WORKS have been started at Fergus Falls, Minn., by Charles Featherstone, who will manufacture the Surprise heater.

THE FULLER-WARREN STOVE COMPANY of Milwaukee held their annual meeting on the 6th inst. and elected the following Board of Directors: Walter P. Warren and G. G. Wolf, Troy; H. A. Viets, John E. Hausen, Wm. Plsnkinton, Francis Hinton, H. S. Haselton, Geo. L. Graves and John Johnston, Milwaukee. A satisfactory year's business was reported, taking general trade conditions into consideration.

THE NEW BUILDING which will soon be erected by the Cleveland Steel Range Company of Cleveland, Ohio, will be 50 x 192 feet and three stories in hight. The main entrance will be at the corner of Detroit and State streets and constructed in the shape of an alcove. The offices will be located on the first floor of the Detroit street front, while the storerooms, laboratory, shipping and erecting rooms, together with the engine and boiler room, will occupy the remaining portion of the floor. The second and third floors will be used for manufacturing purposes. The rear of the proposed building will front on Vermont street and there will be a double door entrance on Vermont and State streets. The estimated cost of the new building is placed at from $15,000 to $20,000.

"THE FRIEND OF THE FAMILY" is the title of a little pamphlet which comes to hand from Buck's Stove & Range Company of St. Louis, Mo. The opening pages consist of a talk on stoves, covering their selection, use, attachments, &c. The pages then describe how to make candy of various kinds, the recipes being presented very full and complete. The illustrations and compilation are by Bert Ball.

THE PORTLAND STOVE FOUNDRY COMPANY of Portland, Maine, have just issued a very neat four page folder printed in colors and calling attention to their Atlantic hot water and warm air combination heater, which is offered the trade in numerous sizes. The device is shown in sectional view, clearly indicating the internal arrangement of parts, while the descriptive text calls attention to the leading features of merit. Illustrations of several dwellings heated by the company's system are also presented.

FRED. E. LEE, manager of the estate of P. D. Beckwith, Dowagiac, Mich., writes us under date of March 5 that after a two weeks' shut down the Round Oak Stove Works resumed operations on Monday, February 25. The works have been running nesrly full since that date, and it was expected by the end of the first week in March they would be turning out their usual amount of work.

THE UNION STOVE WORKS, 70 Beekman street, New York, have completed arrangements by which they are the Eastern agents of the Milwaukee Gas Stove Company, Milwaukee, Wis. They are already making a display of cooking and heating stoves. The Perfection gas ranges on their sample floor are connected with the gas supply and shown in full operation.

W. H. WHITEHEAD, president of the Chicago & Erie Stove Company of Erie, Pa., favored Chicago with a week's visit recently. Mr. Whitehead passed so many years in Chicago and enjoys such a wide circle of acquaintances who hold him in high esteem that a visit there is a perpetual round of handshaking.

TRADE REPORT.

The Iron Market.

Expecting that it would furnish the impetus for a rising tendency, manufacturers of Iron would gladly see a moderate advance in Ore and Coke. But no one wants to be the pioneer and run the risk that competitors cover later at lower prices. While the attitude of buyers of Raw Material is friendly, it is also one of uncertainty and suspicion.

Southern producers of Pig Iron have booked orders quite heavily and yet the market remains stationary with occasional soft spots. In Cincinnati two contracts, one for 12,000 tons of Pig Iron and another for 18,000 tons, were placed by Pipe founders to cover sales of product.

Pig Iron statistics for the month of February show that production is not up to the mark reached earlier in the year. This is chiefly due to the fact that a number of furnaces are undergoing repairs and confirms the statement made some time since that the really modern plant north of the Potomac and the Ohio capable of making Iron at present prices is fully engaged.

Pig Iron.—The movement in the New York district has been light during the past week. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

The demand for Pig Iron in the Philadelphia district has been a little above the average of the past few weeks, but the supply has been in proportion, so that prices are unchanged. Makers of Pig Iron do not regard the situation with much cheerfulness, as it is found impossible to get more money for their Iron, and there is besides a very general complaint in regard to the slowness with which payments are made. Sales include all grades of Iron; the heaviest lots have been No. 2 Foundry at $11 @ $11.25 for Philadelphia and equivalent points, and at about $10 for No 2 at such points as York, Columbia, Harrisburg, &c. Schuylkill Valley buyers have also taken fair sized lots. Ordinary quotations are about as follows for Philadelphia rail deliveries, and from 30¢ to 50¢ less for water, or at points such as York, Harrisburg, &c.:

Standard No. 1 Foundry X	$12.00 to $12.50
Standard No. 2 Foundry X	11.00 to 11.50
No. 2 Plain	10.75 to 11.00
No. 1 Soft	11.50 to 11.75
No. 2 Soft	10.75 to 11.00

The Chicago Pig Iron market is reported as in excellent shape, every week showing a good movement in both Northern and Southern Iron. Contracts for the former are rather larger than for the latter, which, of course, is to be expected. The foundrymen who are buying the most material are the makers of specialties. Jobbing foundries are quiet. More Lake Superior Charcoal was sold during the week than for a long time. Some consumers are now disposed to make season contracts, but they are calling only for small monthly shipments. Large consumers are still holding off. Quotations are as follows for cash:

Lake Superior Charcoal	$13.00 to $13.50
Local Coke Foundry, No. 1	10.25 to 10.50
Local Coke Foundry, No. 2	9.75 to 10.00
Local Coke Foundry, No. 3	9.50 to 9.75
Local Scotch No. 1	10.25 to 10.50
Ohio Strong Softeners, No. 1	12.50 to 13.00
Southern Silvery, No. 1	11.50 to 11.75
Southern Silvery, No. 2	11.25 to 11.50
Southern Coke, No. 2	10.00 to 10.25
Southern Coke, No. 3	9.50 to 9.75
Southern, No. 1, Soft	10.00 to 10.25
Southern, No. 2, Soft	9.50 to 9.75
Alabama Car Wheel	17.50 to 18.00
Jackson County Silvery	15.00 to 15.25
Other Ohio Silvery	14.25 to 14.50

The demand for Bessemer Pig Iron has been extremely light in the Pittsburgh market during the week, and prices are showing a somewhat weaker tendency. On account of the unsettled condition of the Coke question, furnaces are not pressing the market for sales. Mill and Foundry Iron are quiet in demand and unchanged in prices. We quote as follows:

No. 1 Foundry	$10.50 to $10.65, cash.
No. 2 Foundry	9.65 to 9.70 "

The feature of the week in the Cincinnati Pig Iron market has been the large buying of Southern metal by Pipe works, both in the East and West, the principal orders having been secured by local agents. Several days since a contract for about 12,000 tons was placed by local manufacturers of Cast Iron Pipe, and on Monday another order for 18,000 tons was secured by representatives of Cincinnati houses. Both contracts have been entered by Southern furnaces at prices represented by inside quotations, and the deliveries extend over the next five months. The bulk of the sales has been of No. 3 Foundry and No. 2 Soft at $6 25 and $6.50 ℔ ton respectively. Birmingham basis, or $8.50 @ $8.75 ℔ ton; Cincinnati basis, No. 2 Foundry and No. 1 Soft at $6.75 Birmingham, or $9 Cincinnati. For some time past the demand for Softeners has been relatively greater than for the ordinary foundry grades, especially for No. 2 Soft, so that in a schedule of prices No. 2 Soft appears as an intermediate grade—that is, between No. 3 and No. 2 Foundry in price, but No. 2 Foundry and No. 1 Soft are regarded as upon the same level of value. The demand for No. 1 Foundry is relatively light, and it is quotable at $7.25 Birmingham or $9.50 Cincinnati. The contracts placed by radiator manufacturers cover about 9000 tons. In addition to the large trade noted there has been a fair inquiry from and moderate sales to the general consumer. Car works have made additional purchases of 500-ton lots, and general foundries and mills have shown more disposition to buy more freely, or rather less sparingly. Taken all in all, the trade conditions are more encouraging and manufacturing lines are especially confident. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.00 to 9.25
Southern Coke, No. 3	8.50 to 8.75
Ohio Soft Stone Coal, No. 1	14.50 to 15.00
Ohio Soft Stone Coal, No. 2	14.00 to 14.50
Lake Superior Coke, No. 1	11.75 to 12.25
Lake Superior Coke, No. 2	10.75 to 11.50
Hanging Rock Charcoal, No. 1	16.00 to 16.50
Hanging Rock Charcoal, No. 2	15.50 to 16.00
Tennessee Charcoal, No. 1	13.00 to 13.50
Tennessee Charcoal, No. 2	12.00 to 12.50

Sales in the St. Louis market are reported as showing a slight improvement, but they still continue to run largely to quantities which will not average much over 200 and 300 ton lots. The local Pipe works are running full and are steady consumers of Pig Iron, and a noticeable increase is reported from the Stove foundries as well as a good trade from the machine shops. The demand runs largely to No. 2 Foundry and No. 1 Soft, which are quoted respectively at $6.50 and $6.75, f.o.b. cars Birmingham. Consumers are not disposed to anticipate their wants more than 60 days ahead and large sales are necessarily limited. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.00 to $10.25
Southern Coke, No. 2 Foundry	9.50 to 9.75
Southern Coke, No. 3 Foundry	9.00 to 9.25
Southern Car Wheel	16.00 to 16.50

Metal Market.

Pig Tin.—The movement in wholesale prices has been narrow, not exceeding 0.25¢ @ 0.30¢. Speculation has shown less animation and nothing distinctly new in the way of incentive to operations has materialized. At intervals there were signs of weakness and of strength, but neither developed pronounced form from which "bulls" or "bears" derived any decided advantage. Business with out of town dealers and with consumers was slack during the early part of the week, but subsequently improved and involved quite the average amount of Tin all told. Prices at the close were firm on cable advices of an advance in London. Small lots of Straits Pig from store are quoted at 15¢ @ 15¼¢. Arrivals during the week were moderate, but the supply afloat is considerable and the general statistical position is without important change.

Copper.—Prices during the week have fallen to a still lower level. On the decline a very fair business has been done, chiefly in the form of moderate sales to home consumers. In some quarters it is asserted that the decline was due to manipulation by alleged "shorts," but this has hardly the foundation that is back of another explanation to the effect that the market suffers from heavy supplies at producing points, conservative buying by home consumers and difficulty in working export business except at lower prices than those above quoted. In point of fact the market has the appearance of being weak on its merits. Jobbers are quoting 10½¢ ℔ lb for Lake Ingot in small quantities and about 9¾¢ for Common Casting brands.

Sheet Copper.—Consumers are showing more inclination toward purchasing for stock. Inquiry is fairly brisk and some increase is noted in orders for Cornice Copper. Small lots of Sheet Copper from store are quoted at the list price, 14¢ ℔ lb, net.

Pig Lead.—Dealings have been on a very moderate scale and no improve-

ment whatever in the demand has taken place. Buyers go hardly as far as to make reasonable bids on round lots. Prices are a trifle lower and the market is weaker in tone Retail quantities of American Pig from store are quoted at 3⅞¢ @ 3½¢ ℔ lb.

Lead Pipe and Sheet.—A better feeling is reported among buyers, although the strikes in the building trades in this city have caused a temporary lull in the demand for material for spot use. The outlook in the department of Plumbers' Supplies is regarded as favorable for a good summer and spring business. Prices in this section are maintained on the list basis, namely, 5½¢ for Pipe and 6½¢ for Sheet, with 20 per cent. discount.

Spelter.—Buying interest has not been as good as it was during the preceding week, and the demand at present is lifeless, being mainly confined to small lots for early delivery. Western brands in small lots are quoted at 3¾¢ @ 4¢ ℔ lb from store.

Antimony.—A moderate business only has been effected. For small quantities the ruling quotations are about 8¢ for Hallett's and 9¼¢ for Cookson's.

Tin Plate.—Little or nothing in the way of improvement is perceptible in the condition of the market for foreign Plates. Orders from the canning trade are still much below the average for this season in the matter both of spot and forward deliveries. Other consumers, too, show as yet only a moderate inclination toward purchasing beyond the limits of their immediate needs, and dealings in spot stock, although somewhat larger in the aggregate than last week, do not rise above the commonplace. The slackness of business has induced an added keenness in competition for orders, which, together with the augmented output of the domestic works and unfavorable advices from abroad, has served to keep prices unsettled and weak. Stocks in the New York warehouses are not excessive, and the assortment is far from full.

A special London cable dispatch of March 13 to *The Iron Age* reports as follows on the British Tin Plate market: Tin Plate prices average three halfpence lower and the market is very depressed. Many makers are unable to accept such low limits. Buyers seem to be awaiting developments. The proposed scheme to control prices receiving little support has had adverse effect upon the market. Larger demand reported for Wasters for Eastern markets. Stocks at Swansea now about 239,000 boxes, a decrease of about 48,000 boxes the past week. Quotations, f.o.b. Wales, are as follows:

Bessemer Cokes, IC 14 x 20	8/10½	@ 9/3
Siemens Cokes, IC 14 x 20	9/3	@ 9/6
Ternes, 20 x 28	17/6	@ 22/6
Charcoals, IC 14 x 20	10/	@ 13/

THE NEW PLANT of the Pittsburgh Reduction Company, manufacturers of pure aluminum, at Niagara Falls, N. Y., which has been under construction for some months, is about completed and is expected to be put in operation about April 1 next. At the start out the plant will have about three times the capacity for the manufacture of pure aluminum over the present plant of this concern located at New Kensington, Pa. This concern have been negotiating for some time with the United States Government for the supplying of aluminum for three new torpedo boats and they expect to secure the order.

Chicago Report.

Scrap.—A moderate trade is in progress, which is sufficient to take about all the Old Material now offering. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2¼¢
Rubber	....	4 ¢

Anthracite.—Business is light. Carload lots of 12 net tons or over are quoted as follows, although some concessions are now being made:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8.10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

AN ENTIRE FLOOR of the William Yerdon Factory, at Fort Plain, N. Y., is being equipped with the latest machinery for the manufacture of tin pails, which is a new industry for the place. A pail is manufactured, it is stated, in two minutes after passing through various machines. Mr. Yerdon has secured the services of Thomas McAnamy of Los Angeles, Cal., who for a number of years was superintendent of one of the largest factories of this kind on the Pacific Coast. The superintendent of the pattern making department is E. E. Beckwith of Newark, N. J., who was for several years with the A. C. Beckwith pattern making works in that city. A large force of men will be put on as soon as the factory is ready for operation.

CHARLES HOOPER & Co., Dubuque, Iowa, issue circulars calling attention to their muffle Furnaces, also their smelting Furnaces and annealing and burning Furnaces. The muffles are particularly intended for enameling work. At the end of the circular are a number of testimonial letters from those who have used these Furnaces with satisfactory results.

CONDITION OF THE

Hardware Trade.

IT IS PLEASANT to note the improvement in business which is perceptible in some of the trade centers, as this encourages the hope that with the further advance of the season there will be such a general increase in the volume of business as will bring the demand up to something like its normal volume. The indications seem to point to a more marked improvement in the South and West than in the Middle and Eastern States. While it is the general experience that the volume of business is better this year than last, it is not uncommon to hear references to the sluggishness of trade and the reluctance of merchants to buy at all freely. Stocks are certainly kept at an abnormally low point, prices show little change and the market does not as yet assume a regular and uniform tone. There is some complaint in regard to collections and credits are being scrutinized with more than the usual care.

Advices from Chicago.—Shelf Hardware exhibits decided improvement. Orders are still confined to small lots and packages are broken as much as ever, but the orders are very much more numerous. Stocks continue extremely light throughout the country, and as spring advances the demand grows heavier on the retail merchants and they are obliged to replenish more frequently. The weather has been wintry for the past week and has undoubtedly checked outdoor operations considerably, and it is therefore argued with much reason that if trade can be so good under these conditions, it must make a decided spurt as soon as actual spring weather sets in and all kinds of outdoor improvements can be undertaken. The demand for Poultry Netting has been extremely heavy for the past week, but other seasonable goods have not been moving in very large quantities. Prices show little change. Carriage Bolts are still irregular owing to conflicting quotations from manufacturers, and Screws are unsettled on account of the recent circular issued by a large company. The movement in Tinware and House Furnishing Goods has shown a notable increase during the past few days, and the dullness of February is now in a fair way to be forgotten. Taking a broad view of the Hardware situation, it is believed that the volume of business so far this year has been a distinct gain on that of last year up to the same time. Inquiries for Roofing Plates have been larger recently than at any time since last fall, and an early improvement is confidently expected.

Notes on Prices.

Wire Nails.—The volume of business is fair but not especially heavy, the trade confining their purchases to quantities sufficient to cover their early requirements. The tone of the market is not materially different from last week, but there are indications that one or two of the mills are making slight concessions in prices. The fact that jobbers are cutting the price has some effect even beyond the territory in which such cut prices are offered. With the opening of the spring and the going into effect of the new freight rates it is expected that there will be a quickening in the demand, and some are looking for a marked

strengthening in the market with a possible advance.

Advices from Chicago.—Manufacturers appear to be well satisfied with the existing situation, except only with reference to trade in this city. They state that prices are firm and a good volume of business is moving. Predictions are quite freely made of an advance in manufacturers' prices before April 1, on account of the anticipated increase in the demand as soon as actual spring weather is experienced. Jobbers have recently enjoyed a considerably better business from retail merchants, but they state that their trade in this line is very much below the volume enjoyed last year up to the corresponding time. Small lots from stock are quoted at $1 to $1.05, but carload lots are still sold by a few of the leading houses at the old low price, equivalent to 95 cents, Chicago.

Cut Nails.—Somewhat more business is doing in Cut Nails than a week ago. The market continues without change. Small lots from store, New York, are held at 85 to 90 cents.

Advices from Chicago.—Manufacturers have enjoyed a somewhat better business since our last report. Orders seldom run above carload lots, but these have been a little more plentiful. Jobbers sell small lots from stocks at $1.

Barb Wire.—An increasing activity is evident, and the demand is setting in somewhat more freely. The prices at which Barb Wire is being offered by some of the jobbing houses have the effect apparently of unsettling the market to a slight extent. The outlook for the season's business is regarded as favorable.

Advices from Chicago.—Orders are increasing for shipment from factory. The movement recently has augmented very considerably. The expected increase in March is now being realized, and almost every day shows a greater demand. Some of the factories are now very busy, and managers will not be surprised if in a short time they fall behind their orders in accordance with their rules of experience. Small lots from stock are in improving demand at $1.65 for Painted and $2 for Galvanized.

Screws.—There has been no important change in the Screw market since our last issue. The volume of business appears to be moderate, the lower prices announced not having the effect to any marked degree of stimulating trade. Several of the manufacturers have refrained from issuing circulars announcing the revised prices, which are referred to as unprofitably low. The object of the manufacturers in adopting the new discounts was to make them represent the market, and they are adhering quite firmly to them and refuse to give extras as before.

Binder Twine.—The Binder Twine market is in a demoralized condition as far as prices are concerned. While prices are nominally based upon a quotation of 5 cents per pound for Sisal Binder Twine, it is reported that the held over or Banker's Sisal Twine has been offered at 4 cents per pound. While this price is not being met by manufacturers of new Twine, it is a leverage which shrewd buyers make use of when requesting quotations. It is understood, however, that some manufacturers are not desirous of selling Sisal Twine for less than 5 cents, although this price applies to both small and large quantities. Orders have been placed more freely for Twine during the past two weeks than heretofore this season, although the volume of business is still small. The following quotations for Twine represent the market fairly well:

	Per pound. Cents.
Sisal	4¾ to 5
Standard	5
Manila	4¾ to 6
Pure Manila	6¾ to 7

Comet Lawn Sprinkler.—The Comet Lawn Sprinkler, put on the market by the E. Stebbins Mfg. Company, Brightwood, Mass., and illustrated in our issue of the 23d ult., is sold to the trade at $5, subject to a discount of 20 per cent.

Numyr Nozzles.—H. F. Neumeyer, Macungie, Pa., manufacturer of the Numyr Nozzles, a description of which was given in our columns a few weeks since, advises us that in view of the number of Nozzles sold and ordered, he has reduced the price from $54 per gross to $50 per gross.

Glass. — There are no encouraging features in the Glass market, demand continuing limited and prices unremunerative. Committees were appointed at the manufacturers' meeting held in Pittsburgh February 28 to investigate certain features of the Glass business and to report at the next meeting. The subject of foreign competition is receiving considerable attention in connection with the attempt of manufacturers of American Window Glass to work in harmony. It is understood that foreign producers secure advantages in freight to inland points by obtaining direct rates from Liverpool to Chicago and Minneapolis, thus laying their Glass down at those points at a less cost than Pittsburgh manufacturers are able to do. This matter, among others, is receiving the attention of the American manufacturers. It is impossible to determine the result of the movement among manufacturers, as the Glass interests are so large and diversified and as so many questions will have to be considered before any agreement can be reached.

Roofing Slate.—At a meeting held by the Bangor Roofing Slate Manufacturers' Association, at Easton, Pa., on February 28, a revised list of prices for Bangor Roofing Slate was adopted, to come into operation on April 1, 1895. The new list is as follows, per square:

Genuine No. 1 Bangor.

Size.	Price.	Size.	Price.
24 x 14	$3.35	16 x 12	$3.65
24 x 12	3.35	14 x 10	3.65
22 x 12	3.60	18 x 9	4.25
22 x 11	3.60	16 x 8	4.25
20 x 12	3.60	14 x 8	3.75
20 x 10	4.00	14 x 7	3.50
18 x 10	4.00	12 x 8	3.50
16 x 10	4.00	12 x 7	3.25
18 x 12	3.65	12 x 6	3.25

Genuine No. 1 Ribbon.

Size.	Price.	Size.	Price.
24 x 12	$2.75	14 x 10	$3.00
22 x 12	3.00	14 x 8	3.00
22 x 11	3.00	18 x 9	3.25
20 x 12	3.00	16 x 10	3.25
20 x 10	3.00	16 x 8	3.25
18 x 10	3.00		

Terms: Acceptance at 60 days from date of shipment, or 2 % for cash. All freight charges are based on 650 lb to the square. In less than carload lots the cost per square for freight is about double the cost of the carload lots.

John Galt & Son, Postal Telegraph Building, Broadway, New York, forward us the following revised price-list for Albion Vein Roofing Slate at quarry:

Size.	Price.	Size.	Price.
24 x 14	$3.25	16 x 10	$3.85
24 x 12	3.25	16 x 9	3.85
22 x 12	3.45	16 x 8	3.85
22 x 11	3.45	14 x 10	3.50
20 x 12	3.45	14 x 8	3.40
20 x 10	3.85	14 x 7	3.30
18 x 12	3.50	12 x 8	3.25
18 x 10	3.85	12 x 7	3.25
16 x 12	3.50	12 x 6	3.25

Block Tin Pipe.—A reduction has been made by the manufacturers in the list price of Block Tin Pipe from 30¢ to 25¢ ℔ lb, with the customary discount of 20%.

White Lead.—Business has been more active and the market shows somewhat improved tone. Competition is not lifeless by any means, nor have jobbers ceased to make special rates when by so doing the sale of more profitable goods is expedited; but extreme lowest rates recently made by some outside manufacturers are not duplicated and more discrimination is made by jobbers in the matter of concessions. The recognized leading brands of American Lead in Oil are quoted in retail quantities at 5¼¢ to 5½¢ ℔ lb. English is selling in small quantities only as some few brands may be wanted for some special purposes. German is finding very limited sale and importers' prices are without change.

Red Lead. — Foreign brands, the cheaper grades particularly, have been meeting with somewhat better sale, chiefly in fair sized lots for immediate delivery. The movement has served to steady prices somewhat, without, however, causing any advance over late quotations. Domestic product remains without change as to prices and is finding only routine sale. The jobbing price for moderate sized lots is about 5¼¢ ℔ lb.

Old Metals.—Business all told has been only moderate, but an improvement in the volume of inquiry indicates a better feeling among consumers of this class of material. Scrap Iron has shown a more active movement during the week, but supplies are sufficiently abundant to prevent any advance in prices, which continue low for all classes of Old Metals. The following quotations represent about the current rates paid by dealers in this city:

Heavy Copper	℔ lb 7 ¢
Light and Tinned Copper	℔ lb 6½¢
Heavy Brass	℔ lb 4¾¢
Light Brass	℔ lb 3¾¢
Lead	℔ lb 2¾¢
Tea Lead	℔ lb 2½¢
Zinc	℔ lb 2⅛¢
No. 1 Pewter	℔ lb 10 ¢
No. 2 Pewter	℔ lb 5½¢
Wrought Scrap Iron, ℔ gross ton	$7.50 @ $8.00
Heavy Cast Scrap, ℔ gross ton	7.50 @ 8.50
Stove Plate Scrap	℔ gross ton 5.00
Burnt Iron	℔ gross ton 3.00

Old Rags, Paper, &c.—Business is spasmodic, and the call for Paper stock irregular. Dealers' purchasing prices, New York delivery, are approximately as follows:

No. 1 White Rags	℔ lb 3 @ 3¼¢
No. 2 White Rags	℔ lb 2¼ @ 2½¢
Mixed Rags	℔ lb ¾ @ 1 ¢
Blues and 3ds	℔ lb 1⅛ @ 1¾¢
Hard Sized White Shavings	℔ lb 2⅛ @ 2¼¢
No. 1 White Book Shavings	℔ lb 1¾ @ 2⅛¢
No. 2 White Book Shavings	℔ lb 1 @ 1⅛¢
Light Book Shavings	℔ lb ⅝¢
No. 1 Mixed Shavings	℔ lb ⅞ @ 1 ¢
No. 2 Mixed Shavings	℔ lb ⅝ @ ¾¢
No. 1 Printed Books	℔ lb 1 @ 1¼¢
Ordinary Mixed Books	℔ lb ½ @ ¾¢
Newspapers	℔ lb 2-5¢
No. 1 Manila Paper	℔ lb ¾ @ 1 ¢
No. 2 Manila Paper	℔ lb ⅝ @ ¾¢
Bogus Paper	℔ lb ½¢
Common Paper	℔ lb ¼ @ 3 5¢
Straw Chips	℔ lb ⅜¢
Binders' Clippings	℔ lb ¼¢

Jute Butts	℔ lb	1½ @	1¾¢
No. 1 Jute Bagging	℔ lb	1 @	1¼¢
Mixed Bagging	℔ lb	¾ @	1 ¢
No. 2 Bagging	℔ lb	½ @	¾¢
Hemp Twine	℔ lb	2 @	2¼¢
Manila Rope	℔ lb	2 @	2⅛¢
Jute Rope	℔ lb	1½ @	1¾¢
Mixed Rope	℔ lb	¾ @	⅞¢

Old Rubber.—The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots, ℔ lb	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory, ℔ lb	@ .05¼
Rubber Shoes, less than carleads, ℔ lb	@ .04¾
White Wringer Rolls, ℔ lb	@ .03⅞
White Syringes, ℔ lb	@ .03⅞

Trade Notes.

THE 1895 CATALOGUE issued by Wallace & Sons, 29 Chambers street, New York, is a well printed pamphlet of 80 odd pages. The brass and copper rolling and wire mills of the company are at Ansonia, Conn., and a general view of the works forms the frontispiece of the publication. A view is also shown of their New York warehouse, this being followed by an alphabetical index of the contents. The first goods are Sheet Brass, then come German Silver Wire, Brass and Copper Wire, Plating machines, Sheet and Bolt Copper, Cornice Copper, Copper Bottoms, Nails and Tacks. A variety of Soldering Coppers are shown, known as the Star brand, and particular mention is made that they are hand forged and not cast. Rivets and Burrs and Tubing follow, the tables of Tubing giving all particulars of both the brass and copper. Ferrules, Chains, Snaps, Brass and Zinc Stair Plates, Hinges and Checks come next; then a varied assortment of fancy Brass Borders, Oilers, Wire Cloth, perforated Brass and Copper, Lanterns, Lamps, Burners are noted. The final pages of the catalogue are given up to tables showing the difference in wire gauges; also tables of weights and dimensions of Copper and Brass Wire, weights of Sheet Copper, tables of areas, circumferences, diameter of circles and other tables of general interest.

THE GRECIAN METAL POLISH COMPANY is the name of a concern recently organized in Kingston, N. Y., for the manufacture of a liquid Polish which is said to be excellent for cleaning and polishing metals. Luke R. Ford is president of the company.

WM. J. GORDON, 218 New street, Philadelphia, is running his works at their fullest capacity. He reports that the orders on hand for his specialties are sufficient to keep his shop full for some time. He has just issued a 20-page catalogue, of convenient size, covering his line of special machinery for the manufacture of Tin and Sheet Iron Ware and Can Body Machines. Especial prominence is given to the Gordon Patent Automatic Can Body Power Seaming Machines, which it is claimed will seam and deliver at one operation, at the rate of 10,000 to 20,000 can bodies in ten hours, and are adapted for seaming the bodies of fruit, paint, lard, spice, baking powder, snuff and lye cans, and a large variety of other articles. Other machines shown are a Single Action Power Press, Combination Power Press, Double Action Power Drawing Press, latest improved Drawing Power Press and an Edge Curling Machine, all patented.

A FIRE which occurred in Detroit, Mich., on March 8, destroyed a large building occupied, along with other manufacturing firms, by the Detroit Stamping Company and Wagner & Ernewein, manufacturers of tinware. The total loss is estimated at about $90,000.

THE ALLEN & ACKLEY ANTI-RUST JAPAN MFG. COMPANY are one of the rising enterprises of Cincinnati, Ohio. The company's works are reported to be in active operation filling orders for their specialty, a preparation which is claimed to prevent the corrosion caused by the action of salt air and salt water on metals exposed to their influence. A recent government test of metal plates coated with this composition resulted in a very favorable report being made in regard to it by the navy officials who conducted the trial.

THE PLANT of the Field Force Pump Company, Lockport, N. Y., was destroyed by fire on March 8. The loss is estimated at $25,000; insurance about $12,000. About $3000 worth of new machinery had been put into the building the day before. The fire is supposed to have been of incendiary origin.

THE F. F. ADAMS WRINGER WORKS of Erie, Pa., which are a branch of the American Wringer Company, will be dismantled in the course of two or three months. The machinery will be divided between the works of the company in Auburn, N. Y., and Woonsocket, R. I. The works to be dismantled give employment to 130. The annual payroll is about $60,000. The capacity of the American Wringer Company will remain as large as hitherto by increasing the business in Auburn and Woonsocket.

THE ESTEY WIRE WORKS COMPANY have been incorporated, with a capital of $25,000. They will continue the business formerly conducted under the style of W. S. Estey at 65 Fulton street, New York. Mr. Estey, Cornelius P. McGuire, John C. Hessler and W. O. Chapman are interested in the new company.

THE lower foundry of R. D. Wood & Co., at Melville, N. J., has resumed operations.

F. I. EVERETT has been engaged by Hibbard, Spencer, Bartlett & Co. of Chicago to represent them in Northern and Central California during 1895. Mr. Everett formerly represented the Huntington Hopkins Company of San Francisco.

THE HYDRO CARBON BURNER COMPANY have been incorporated at Kansas City, Mo., with a capital stock of $100,000, for the purpose of manufacturing a vapor burning device.

JAMES E. SALTER of Philadelphia, Jawood Lukens, A. L. Murphy and Jesse L. Heywood of Conshohocken, and Lewis N. Lukens of New York, have organized the Conshohocken Galvanizing Company. The officers are: President, James E Salter; treasurer, James E Salter; secretary, Jesse L. Heywood. The company were organized for the purpose of galvanizing, leading and tinning metals. Their principal business will be galvanizing pipe. A part of the buildings of the Tube Company, Conshohocken, will be used for the present for the tanks and other necessary apparatus.

The city of Anderson, Ind., has let a contract for the erection of a garbage cremstory at a cost of about $6000.

CONTENTS.

	Page.
Editorials:	
Cold Weather Casualties	33
Natural Gas in Foundry Cupolas	33
Reckless Building	33
The Letter Box—	
Ventilating a Barn	34
Steam Diaphragm	34
Will It Circulate? Illustrated	34
Pipes Burst by Freezing	34
How to Bind *The Metal Worker*. Illus.	35
Water Hammer in Pipes	35
Automatic Damper Regulator	35
High Pressure Water Heating	35
Radiating and Heating Surfaces	35
Question of Gas Pressure	36
Inside Cold Air Duct	36
What Is a Vacuum?	36
A Peculiar Furnace Experience	37
Collapsed with a Vacuum Valve	37
Paste for Asbestos Paper	37
Wants to Stop a Gas Leak	37
A Question in Furnace Construction	37
Which Is the Best for Furnace Tops?	37
Steam and Hot Water—	
The Steam Fitters' Convention	38
The Carton Boilers. Illustrated	38
A Circuit Hot Water Job. Illus	40
Heating Notes	40
Heating and Plumbing—New Work and Contracts	41
The Retail Store—	
The Ladies' Delight Oil Cooker. Illus.	43
Enterprise Raisin Seeder. Illus	43
Crescent Automatic Spray and Force Pumps. Illustrated	43
Ideal Water Filter. Illustrated	44
Air Tight Waste Trap	44
The Evans Protective Milk Can. Illus.	44
Memoranda	44
Roofing and Cornice—	
A New Roofing Slate Association	45
Sub-Letting in Building Contracts	45
Finish for Slate Roof at Ridge and Hip. Illustrated	46
Flashings	47
The Smith Flanged Ventilating Fan. Ill.	47
Plumbing and Gas Fitting—	
Growth of the National Association of Master Plumbers	48
Plumbers' List of Manufacturers	48
The Douglas Rubber Elbow. Illus	48
The Henrie Improved Plumbers' and Tinners' Soldering Furnace. Illus	48
Draining Plumbing Systems	48
Central Supply Association	49
Eastern Supply Association	49
Hardwood Bathtub. Illustrated	49
Sherman's Basin Clamp. Illustrated	50
The Columbus Soap Cup. Illustrated	50
Traps and Vents	50
Death of Alexander McKay	51
News and Notes	51
The S. & W. Drilling Attachment. Illus.	52
The Bliss Deep-Throat Power Press. Ill.	53
Paper Water Pipes	53
Tin Plates—	
Scrap	54
Stove Trade Notes—	
Foundry Mixtures for Stove Castings	55
Gasoline Stoves	55
Brand's Catalogues	55
Florida as a Market for Heating Stoves.	55
The Rockford Grate. Illustrated	56
Odd Plates	57
Trade Report—	
The Iron Market	59
Metal Market	59
Chicago Report	60
Condition of the Hardware Trade	60
Notes on Prices	60
Trade Notes	62
Metal and Miscellaneous Prices	63
Labor Exchange—	
Help and Situations Wanted	65

Metal and Miscellaneous Prices.

CHICAGO, MARCH 14, 1895.

Tin—

Straits pigs.....15¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Celland and MelynGrade	IO, 10 x 14	@ $5.75
	IO, 12 x 12	@ 5.75
	IO, 14 x 20	@ 5.75
	IO, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX, 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 25.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade.	IO, 10 x 14	@ 5.12½
	IO, 12 x 12	@ 5.12½
	IO, 14 x 20	@ 5.12½
	IC, 20 x 28	@ 10.25
	IX, 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX, 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—IC, 10x14, 14x20		@ $4.70
	IC, 14x20, 90 lb	@ 4.20
	IC, 14x20, 100 lb	@ 4.50
	10 x 20	@ 7.00
	20 x 28	@ 9.50
	IX, 10x14, 14 x 20	@ 6.00
B.V. Grade.	IC, 10x14, 14x20	@ ....

Charcoal Plates.—Terne

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC, 14 x 20	@ $4.75
20 x 28	@ 9.50
IX, 20 x 28	@ 12.00
Worcester Brand and equal.—	
IC, 14 x 20	@ 4.87½
IC, 20 x 28	@ 9.75
IX, 14 x 20	@ 6.12
IX, 20 x 28	@ 12.25

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28	$11.75	$11.25
IXX, 14 x 28	13.00	13.75
IC, 14 x 31	13.00	12.50
IXX, 14 x 31	15.00	15.00
		Per box of 56 sheets
IC, 14 x 56		$12.50
IXX, 14 x 56	25.50	14.00
IC, 14 x 60		13.50
IXX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.25
IX, 10 x 14, 12 x 12, 14 x 20 6.50

Florence.—

IO, 10 x 14, 12 x 12, 14 x 20. $5.50
IX, 10 x 14, 12 x 12, 14 x 20. 7.00

Palma.—

IO, 10 x 14, 12 x 12, 14 x 20.. 6.00
IX, 10 x 14, 12 x 12, 14 x 20.. 7.50

Usual extra or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20 $6.25
IX, full weight, 14 x 20 8.00

Irondale A A:

IC, full weight, 14 x 20 5.25
IX, full weight, 14 x 20 6.75

Irondale A:

IC, full weight, 14 x 20 5.00

Irondale B:

IC, 100 lbs., 14 x 20 4.25
IC, full weight, 14 x 20 5.00

Irondale C, IC, 14 x 20, 100 lbs. 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $4.75
Old Hundred, IC, 14 x 20, 100 lbs. 4.50
R. W. & B., IC, 20 x 28, 216 lbs. 9.50
Old Hundred, IC, 20 x 28, 200 lbs. 9.00

Roofing Plates.

Palm, IC, 20 x 28 @ $10.00
Palm, IX, 20 x 28 @ 12.00
Empire, IC, 20 x 28 @ 10.75
Empire, IX, 20 x 28 @ ....
Hickory, IC, 20 x 28 @ 11.50
" IX, 20 x 28 @ 14.00
Alaska (heavily coated), IC, 20x28 @ 13.00
Alaska IX, 20 x 28 @ 16.00
Special, IC, 20 x 28 @ 13.00
" IX, 20 x 28 @ 16.00
Niagara, IC, 20 x 28 9.50
Iroquois, IC, 20 x 28 9.00

Westmoreland:

IC, 14 x 20 5.00
IC, 20 x 28 10.00
IX, 14 x 20 6.25
IX, 20 x 28 12.50

Kenwood:

IC, 14 x 20 4.75
IC, 20 x 28 9.50

Furmston:

IC, 14 x 20 4.50
IC, 20 x 28 9.00
IX, 20 x 28 11.50

Irondale AA, IC, 14 x 20 5.75
Irondale A, IC, 20 x 28 10.50
Irondale B, IC, 20 x 28 10.00
Each extra cross $1.50.
Challenge, IC, 20 x 28 10.50

Juno:

IC, 14 x 20 ....
IC, 20 x 28 ....

Illinois, Old Method:

IC, 20 x 28 13.50
IX, 20 x 28 16.50

E. L.:

IC, 20 x 28 10.75
IX, 20 x 28 13.25

Jessie:

IC, 20 x 28 10.25

Old Process:

IC, 14 x 20 8.00
IX, 14 x 20 9.50
IC, 20 x 28 16.00
IX, 20 x 28 19.00

H. B. L., Old Style:

IC, 14 x 20 7.00
IX, 14 x 20 8.25
IC, 20 x 28 14.00
IX, 20 x 28 16.50

H. G. M. & Co., New Process:

IC, 14 x 20 4.50
IC, 20 x 28 9.00

Extra Fine Granite:

IC, 14 x 20 4.87½
IC, 20 x 28 9.75
IX, 20 x 28 12.25

Raveuswood:

IC, 14 x 20 5.25
IC, 20 x 28 10.50
IX, 20 x 28 13.00

H. G. M., Old Style:

IC, 14 x 20 7.00
IC, 20 x 28 14.00
IX, 20 x 28 16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.40

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	₩ lb 2 1-10¢	2.60¢
17 to 20	₩ lb 2 2-10¢	2.70¢
21 to 24	₩ lb 2 3-10¢	2.80¢
25 and 26	₩ lb 2 4-10¢	2.90¢
27	₩ lb 2 5-10¢	3.00¢

Russia, Planished, &c.

100 lbs.

Patent Planished, ₩ lb, A.....$10.20 } 10%
Patent Planished, ₩ lb, B..... 9.20 } dis
Craig's Polished Sheet Steel.....8¼¢

Galvanized.

Juniata, or first quality dis. 75&10@75&10&2½%

Copper—

Ingot.

Lake.....16½¢ @ 11 ¢
Casting Brands.....9¾¢ @ 10 ¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 8¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.) (To No. 19 inclusive.)

Disconnt, 40%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .48
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .88
Plain, 8 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 lb casks.....$4.50
800 lb casks..... 4.75
Loose sheets..... 5.00

Solder—

½&½.....9¼@10¢
Extra Wiping.....8½¢

The prices of the many other qualities of Solder in the market indicated hy private hrands vary according to composition.

Antimony—

Cookson.....10@11¢
Hallett's.....8¾@9¢

Lead—

Soft Pig Lead..... 3¼¢
Bar..... 3¾¢
Pipe.....5½¢, dis 10¢
Block Tin Pipe..... 35¢
Sheet.....6¢, dis. 10¢

Wrought-Iron Pipe—

1¼ and under, Plain.....70%
1¼ and under, Galv.....64%
1¼ and over, Plain.....77½%
1¼ and over, Galv.....67½%
Boiler Tubes, list Oct. 24, 1892.....68%
Casing, list Nov. 16, 1892..... 52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....57½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 5 inches, inclusive.....dis 75&10%
Other sizes..... dis 70%

Leader Pipes—

Abendroth's Galv. Spiral Riveted. 60%
Austin's Corrugated..... 70%
Gordon & Gilbert's Corrugated.... 70%
Ritchie's (Galv. Iron only) Cor'd.... 70%
Ritchie's Spiral Lock Seam, Galv'd.. 60%
Austin's Spiral Ribbed Pipe..... 65%
James A. Miller Bros. (Galv'd Iron only) Corrugated..... 70%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list..... 50%

Steel Roofing—

Perfection.....$2.75 square
Climax.....$2.65 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$2.10 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....8 @ 10¢
Iron Paint, Bright Red.....₩ lb, 2 ¢
" " Brown.....₩ lb, 1½¢
" " Purple.....₩ lb, 2½¢
" Ground in oil, B. Red ₩ lb, 6½¢
" Ground in oil, Red.. ₩ lb, 6½¢
" Ground in oil, Brown ₩ lb, 6½¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls.....60¢
Linseed Oil, Raw, in bbls.....58¢
Mineral Paints..... 2@4¢
Orange Mineral..... 8¢
Pure White Lead in Oil.....5½@5¾¢
Dry White Lead in bbls.....4¾@5¼¢
Red Lead, American.....5½@5¾¢
Red Venetian, English, dry .....1¾@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs..... 7½¢
Sipe's Japan Oil, in bbls. ₩ gal..... 34¢
Spirits Turpentine, in bbls., ₩ gal. 40½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.40
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.00
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.25
Roofing Pitch, lb bbl. of 300 lb.....$2.80

NEW YORK, MARCH 15, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots.....₩ lb, 63¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ lb, 60¢
100-lb lots.....₩ lb, 55¢
Ton lots.....₩ lb, 53¢
No. 2 grade (guaranteed to be over 94% pure Alnminum), cast in ingots for remelting:
Small lots.....₩ lb, 55¢
100-lb lots.....₩ lb, 53¢
Ton lots.....₩ lb, 50¢

Antimony—

Cookson.....₩ lb, 9¼@9½¢
Hallett's.....₩ lb, 8 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.	
¾-in. up to 2-in.	$0.35	25 @ 30%
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝-in.	.38	
⅜-in. up to ½-in.	.41	
5-16-in. up to ⅜ in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛ in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 19, inclusive,	.38	

Cooper and Bronze Tubing—

84 ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square.*—
Galvanized.....70%
Galvanized, Locked Joints.....70%
Tin.....70%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*18¢ ₩ lb, net
Ingot.

Lake.....10½¢
Ansonia Grade Arisona.....10¼¢
Ansonia Grade Casting.....9¾¢
Planished.....net
Sheet and Bolt.....14¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:
Lap or Slip Joint, Galvanized.....75%
Lap or Slip Joint, Terne.....70%

Eave-Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....85%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 Inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.

Tin.....85%
Galvanized.....85%

Corrugated.

Flat Crimp.

Galvanized.....70%

Round or Square.

Tin.....70%
Galvanized.....70%

Iron, Sheet—

Black.

Nos.	Common American.	R. G. Cleaned American.
10 to 16	₩ lb 2.25	2.50¢
17 to 21	₩ lb 2.35	2.60¢
22 to 24	₩ lb 2.45	2.70¢
25 and 26	₩ lb 2.55	2.80¢
27	₩ lb 2.65	2.90¢
28	₩ lb 2.75	3.00¢
American B. B.	₩ lb, 4¢@4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11@11½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 8¾
Oralg Polished Sheet Steel.....₩ lb 8¼¢

Galvanized.

	B. B.
Nos. 10 to 16	75&10@75&10% off.
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3½@3¾¢
Bar.....4@4½¢
Pipe.....5½¢ 20%
Tin Lined Pipe.....12½¢ 20%
Block Tin Pipe.....25¢ 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2½¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 8.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....20%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's. 100 @ 500 lb.....5¾¢
Lead, Amn. White, in oil..... @ 5¾
Lead, Red, bbls. and ½ bbls... @ 5¾
Lead, Red, kegs..... @ 5¾
Ocher, American..... @ 1½
Red Venetian, American..... @ 1¾
Linseed Oil:
Raw, ₩ gal..... @ .56
Boiled..... @ .59
Spirits Turpentine:
In bbls..... @ .30
Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01¾ @ .02¼
In bladders..... .01¾ @ .02¼
Roofing Material, &c.:
Asphaltum Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ lb..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch ₩ bbl..... $2.25

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron. Soil—

"Standard" Pipe, 2 to 6 Inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe, " " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7½	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.65@$1.66
Rosin, E. & F.....₩ bbl. $1.70@$1.80
Rosin, G. & H. .....₩ bbl. $1.90@$2.20
Rosin, I. & K.....₩ bbl $2.45@$2 60
Rosin, M. & N.....₩ bbl $2.90@$3.20

Seamless Brass Tubes..net

List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Solder and Soldering Fluids—

Solder—

½&½, guaranteed.....11¢
No. 1.....8½@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.

In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 ℔, ₩ ℔.....3½¢ } 5% dis.
½ bbls., about 300 ℔, ₩ ℔.....4¢ } 5% dis.
Kegs, about 110 ℔, ₩ ℔.....4¢ } 5% dis.
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢ } 5% dis.

Yager's Soldering Salts.

¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....3¾¢@4¢
Bertha (pure).....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....15@15½¢
Straits, pigs, ₩ ℔.....14½@15¢
Straits in bars, ₩ ℔.....15½@16¢

Tin Plates—

American Terne Plates—

N. B.—The following Terne Plate quotations are for 20 x 28, unless otherwise specified; 14 x 20 Plates are half the prices given below.

Alaska (re-squared) IC.....$13.00
Alderly, extra quality, IC.....10.75
Allegheny, IC.....9.00
" IX.....11.50
Anchor, IC.....8.25
Apollo Roofing, IC.....11.00
" " IX.....13.00
Black Diamond (Extra Coated), IC.....15.00
Bonus (Extra Coated), IC.....11.50
" " " IX.....14.50
Boston, IC.....12.50
Brooklyn, IC.....9.00
Capitol, IC.....8.50
Central, IC.....9.50
Climax, IC.....8.75
Columbia, IC.....12.50
" IX.....15 50
Columbus, IC.....9.50
Dunlap's Double Dipped, IC.....15.00
" " " IX.....17.00
" Domestic, IC.....10.00
Empire, IC.....10.25
Eureka, IC.....9.50
" IX.....12.00
Eureka, 200 lbs., IC.....9.20
Excelsior, IC.....9.50
Filbert, IC.....14.50
Flag, IC.....8.00
Florida, IC.....9.50
Flushing, IC.....12.50
Freeport (Hand dipped and Resquared). IC.....13.00
IX.....15.50
F. R. P., Extra, IC.....15.00
Globe, IC.....8.50
" IX.....11.00
Golden Star Old Style, IC.....15.00
" " " " IX.....18.00
Grace, IC.....8.50
Hamilton's Best Redipped, IC.....15.50
" " " IX.....18.50
Hickory (Resquared), IC.....11.00
J. L. O., IC.....9.25
Juniati, IC.....8.50
Juno, IC.....11.00
Kensington, IC.....13.50
" IX.....16.00
Knoxall, IC.....9.00
" IX.....12.00
Laufman's Apollo (Resquared), IC.13.00
Laufman's Apollo (Resquared), IX.16.50
Leominster, Extra Coated, IC.....11.50
Lion (Stamped), IC.....11.50
Lulu, IC.....10.50
" IX.....13.50
Maple, IC.....11.00
" IX.....14.00
Merchant's Roofing (Resquared).IC.15.00
Meurer's Old Method, IC.....15.00
Meurer Roofing, IC.....14.00
National, IC.....11.00
Nava, IC.....10.00
" IX.....12.50
New Castle Old Method, IC.....18.00
New Castle Palm, IC.....14.50
Old Colony, IC.....15.00
Old Method, IC.....13.00
" IX.....16.00
Osborn's Old Process, IC.....14.00
" " IX.....17.00
Osceola, Old Style, IC.....14.50
" " IX.....17.50
Pennsyl Old Method (Treble Coated), IC.....14.00
Phillips' Roofing, IC.....14.00
Phœnix, IC.....9.25
Pullman, IC.....11.50
Republic, IC.....9.50
Scott's Extra Coated (Resquared), IC.....16.00
Scott's Extra Coated (Resquared), IX.....19.00
Standard, IC.....8.30
Star IC.....10.50
" IX.....13.00
Superior, IC.....9.00
Taylor Old Style (Resquared), IC..15 60
" " " IX.18.00
The Taylor Roofing, IC.....13.50
" " IX.....16.50
The Osborn Roofing, IC.....11.50
" " " IX.....14.00
Thomson's Puritan, IC.....11.00
Tip Top, IC (Resquared).....9.75
" IX " 12.25
Triumph, Old Style, IC.....15.00
" " " IX.....18.00
U. S. Monongahela, IC.....12.20
U. S. Redipped, IC.....16.50
Venus, IC.....8 25
Waldo, IC, Hand-dipped.....11.50
Westmoreland, IC.....12.50
Willow, IC.....10.00
" IX.....13.00
Zero, IC.....9.00

American Bright Plates—

Almond, IC, 20 x 28.....$9.00
" IX, 20 x 28.....11.50
Brilliant (Tissue Packed), IC, 20x28 16.50
" " IX, 20x28.20.00
Brooklyn, IC, 14 x 20.....5.50
Century, IC, 14 x 20.....5.00
Climax, IC, 14 x 20.....4.75
Excelsior, IC, 14 x 20.....6.50
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....5.50
Florida, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Gladys IC, 14 x 20.....4.50
Hazel, IC, 14x20.....5.80
Ivy, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Linden, IC, 20 x 28.....10.00
" IX, 20 x 28.....12.50
Mars, IC, 14x 20.....4.50
" IX, 14 x 20.....5.50
Merchant's Dipped, IC, 14x20.....10.00
Merion, IC, 20 x 28.....11.00
" IX, 20 x 28.....14.00
Mint, IC, 20x28.....8.50
" IX, 20x28.....11.00
New Castle Best Palm Charcoal, IC, 14 x 20.....5 50
" " IX, 14 x 20.....6.75
New Castle Palm Charcoal, IC, 14 x 20.....5.00
" " IX, 14 x 20.....6.25
New Castle, Charcoal, IC, 14 x 20...4.50
" " IX, 14 x 20...5.50
New Castle, S. Charcoal, IC, 14 x 20. 4.25
" " IX, 14 x 20. 5.25
New Castle Palm Coke, IC, 14 x 20..4.25
" " IX, 14 x 20..5.25
New Castle Coke, IC, 14 x 20.....4.00
" " IX, 14 x 20.....5.00
Oak, IC, 14 x 20.....4.75
Palma, IC, 14x20.....6.00
Pansy, IC, 20 x 28.....10.50
" IX, 20 x 28.....13.00
Phœnix, IC, 14x20.....5.25
" IX, 14x20.....6.50
Royal, IC, 20x28.....12.00
" IX, 20x28.....15.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Walnut, IC, 14 x 20.....4.65
Youghlogheny, IC, 14 x 20...6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$6.2
20 x 28.....12.5
Pontymlster Old Style Grade, IC, 14 x 20.....5.50
20 x 28.....11.00
IX, 14 x 20.....6.50
20 x 28.....18.00
Worcester Grade, IC, 14 x 20.....4.50
20 x 28.....9.00
IX, 14 x 20.....5 75
20 x 28.....11.50
Dean Grade.—IC, 14 x 20.....4.25
20 x 28.....8.50
IX, 14 x 20.....5.50
20 x 28.....11.00
Aberoarne Grade.—IC, 14 x 20.....4.00
20 x 28.....8.00
IX, 14 x 20.....5.50
20 x 28.....11.00
Mansel Grade, IC, 20 x 28.....8.00

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade. IC, 10 x 14.....$5.25
" " IC, 12 x 12.....5.50
" " IC, 14 x 20.....5.25
" " IC, 20 x 28.....10.50
" " IX, 10 x 14.....6.50
" " IX, 12 x 12.....7.00
" " IX, 14 x 20.....6.50
" " IX, 20 x 28.....13.00
" " DC, 12½ x 17.....5.00
" " DX, 12½ x 17.....6.50
Allaway Grade. IC, 10 x 14.....4.75
" " IC, 12 x 12.....5.00
" " IC, 14 x 20.....4 75
" " IC, 20 x 28.....9.50
" " IX, 10 x 14.....5.50
" " IX, 12 x 12.....5.75
" " IX, 14 x 20.....5.50
" " IX, 20 x 28.....1.00
" " DC, 12½ x 17.....4.25
" " DX, 12½ x 17.....5.00

Coke.

Steel Coke.—IC, 10x14, 14x20.....4.25
10x20.....6.50
20x28.....8.50
IX, 10x14, 14x20.....5.25
B. V. Grade.—IC, 10x14, 14x20.....4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$11.50
IXX, 14x28..(112 sheets).....11.90
IXX, 14x31..(112 sheets).....13.25

Tinning—Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and under, Plain.....70%
1¼ and under, Galv.....64%
1½ and over, Plain.....77%
1½ and over, Galv.....68%
Boiler Tubes.....75@77½%
Screw and Socket Joint Casing.....65%
Inserted Joints Casing.....60%

Zinc—

600 ℔ casks.....₩ ℔ 4¾¢
Per ℔.....5¼¢

It Is Reported—

Alabama.

That the Perry Hardware Company, BIRMINGHAM, have been incorporated, with a capital stock of $30,000.

California.

That the Barrett-Hicks Company, a corporation with a capital stock of $75,000, have succeeded to the Hardware business of Barrett, Hicks & Co., FRESNO. C. W. Barrett is president of the company, J. D. Hicks, vice-president, and George E. Evans, secretary and treasurer. These persons with F. W. Fisher and G. H. Glassford constitute the Board of Directors.

Colorado.

That W. Chapman, Hardware, GARRISON, has sold out to Chapman & Forrest.

That the Midland Hardware Company, COLORADO CITY, have sold out to John Gray.

Connecticut.

That H. L. Mills, Hardware merchant, NEW BRITAIN, has presented the Young Men's Temperance Society with a handsome and valuable umbrella rack for use in its new hall. The rack is made of oak, with metal trimmings, and is large enough to hold 70 umbrellas.

That the firm of A. H. & E. W. Abbe, dealers in Hardware, NEW BRITAIN, have just made a splendid gift to the Young Men's Temperance Society of that city. The society's new building is nearing completion and the contract with the builder says that all Hard ware used in the building shall be paid for by the society. The firm have just presented the society, through the contractor, with all the Hardware necessary to fully equip the new building.

Illinois.

That F. H. Rearick has taken his son, Harry F. Rearick, into his Hardware business at GALESBURG. The style will hereafter be F. H. Rearick & Son.

That T. W. Watt, Hardware, MORRISON, has been succeeded by Ritchie & Watt.

That Marks & Cox, Hardware, &c., ABINGDON, have sold out.

That F. A. Dutcher has disposed of his Hardware business at CHERRY VALLEY to Thomas Lee. Mr. Dutcher has had a long experience in the Hardware business and has earned the rest he now purposes to take.

That C. Kergher & Son, CARROLLTON, have sold the Stove and Hardware branch of their business to Rafferty & Carmody.

That the Hardware firm of Rowe & Jones, GORIN, have dissolved partnership, Mr. Rowe continuing the business.

That C. W. Dickerson, Hardware merchant of WYOMING, has entered into partnership with Deyo Brothers of BRADFORD, and the business in Wyoming will be conducted under the firm name of Deyo Brothers & Co. This change is made for the purpose of taking care of the increasing Implement trade, which was more than Mr. Dickerson could handle in connection with his Hardware trade.

Indiana.

That Elmer Secor of ALBION is thinking of engaging in the Hardware business at CHURUBUSCO.

That Gibbs & Thomas, Hardware merchants, GREENFIELD, have been succeeded by Thomas & Jeffries.

Iowa.

That Waples & Willits, Hardware, &c., CASTANA, have been succeeded by Waples & Sons.

That John Olinger is successor to George M. Violet in the Hardware business at AFTON.

That there is an opening for a Hardware store at MANSON CITY.

That the Hardware stock of J. H. Barlow, THORNTON, has been purchased by Elmer Bailey, who will take possession about April 1.

That MEDIAPOLIS is soon to have a new Hardware store, which will be opened in the Wesley Young Building on Main street.

That J. H. Hammond, Hardware merchant, OTO, has been succeeded by D. M. Leadingham.

That Geo. S. Sneer, formerly of WILLIAMSBURG, has started a Hardware store at WATKINS.

That W. L. Paup & Co., MANILA, dealers in Hardware and Agricultural Implements, have been succeeded by Hoffeins & Shade.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A boy with two or three years' experience at plumbing; one who can do some jobbing prefered, and who will make his home with his employer. E. J. McGinley, 2949 Richmond street, Philadelphia, Pa. Mar. 16

A steady man who can do first-class work at plumbing and general country jobbing; one having a knowledge of tinning and roofing preferred. Day & Holt, Catskill, N. Y. Mar. 16

A practical PLUMBER and FURNACE HAND; steady work to the right man; state wages wanted; reference required. "T. A. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

TRAVELING SALESMAN for large assorted line stoves; modern goods; on commission. "Stoves," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 16

A first-class PLUMBER, TINNER and FURNACE SETTER; a steady job and good wages to the right person; must be strictly temperate. Call on or address E. C. & J. R French, Dryden, N. Y. Mar. 16

A competent TINSMITH with some business ability; one with a fair knowledge of plumbing, who could take part interest in business; have a line of good work; first-class tools and machines; pleasant and well lighted shop, in the healthiest and pleasantest town in Western New York; good opportunity for the right man. "O. K.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

A wide-awake SALESMAN having a knowledge of the furnace business, to sell a special heating apparatus on liberal commission; a good opening for the right man; give age, experience and reference. "Pure Air," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

FOREMAN in malleable iron foundry; must understand how to handle men to best advantage and be able to produce high grade iron at low cost. "Malleable," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 9

SALESMAN wanted to sell tin plates as side line for Kentucky, Missouri and Northwestern States. "79," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 9

A TINSMITH by March 15; a man who understands working in country tinshop; would like man with some knowledge of plumbing and iron pipe work; must be strictly temperate; single man preferred; please address, stating wages, "Iron Pipe," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

FOREMAN for iron molders; a man competent to take charge of a molding department manufacturing stoves, furnaces and water heaters; reply by letter, giving name, age, capabilities, references. "Molder," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 9

A first-class FOREMAN for a metal stamping works; must understand fully about sheet metal goods and take good care of men; a good opening for right party. Fred. F. Bischoff, Libertyville, Ill. Mar. 9

An experienced TRAVELING STOVE SALESMAN. Address by mail, Detroit Stove Works, Detroit, Mich. Mar. 9

SITUATIONS WANTED.

By a BLACKSMITH; one who understands all branches; steel work or machine forging. "M. A. S.," 21 Division street, Brockton, Mass. Mar. 16

By a first-class TINSMITH; able to work on copper, brass, iron and tin; city or country; please state wages. Wm. Bartels, P. O. Box 531, Susquehanna, Pa. Mar. 16

Steady situation as STEAM, GAS and HOT WATER FITTER; ten years' experience at house heating and school house work; would prefer a place to look after jobs or learn to figure on work; would go on trial; strictly temperate. P. O. Box 297, Worcester, Mass. Mar. 16

A German, five weeks in this country, offers his services to any one desiring an A1 MECHANICAL ENGINEER, who has graduated in Germany; is 27 years of age and understands the English and French languages. P. Oppenheim, care Mr. Boelkow, 252 East Seventy-eighth street, New York City. Mar. 16

By a first-class PATTERN FILLER who can also do mending and fitting; can give first-class references. "J. C. L.," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. Mar. 16

By a first-class TIN and SHEET IRON WORKER; best of reference. H. M. Clark, 371 South Fifth street, Brooklyn, N. Y. Mar. 16

Steady situation as CLERK in the house-furnishing, tin and hardware business; eight years' experience; 25 years of age. "Hardware Clerk," Box 54, Williamsbridge, New York City. Mar. 16

As SALESMAN, by a practical man with experience and good references; well posted on steam and hot water boilers and all classes of heating apparatus; traveling for New York house preferred. "L. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

As FOREMAN or SUPERINTENDENT; New York man with good practical knowledge of all kinds of steam and hot water heating; able to handle men and take charge of construction; has held similar position with large house and can give first-class references; holds an M. A certificate from the college of the "Die Stock." "S. G.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

By a first-class PLUMBER, GAS, STEAM and HOT WATER FITTER, TIN and SHEET IRON WORKER; can estimate and take full charge of men and business; formerly in business himself; 14 years' experience; temperate; would prefer middle or Southern States. "S. C. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

By a PLUMBER; 22 years of age; fair knowledge of steam and gas fitting; strictly temperate; good worker; will work for $9 a week; Southern States preferred. James Andrews, 19 Liberty street, Troy, N. Y. Mar. 16

By a young man, 25 years of age, CORNICE SKYLIGHT, TIN and SHEET IRON WORKER; also acquainted with roofing; wages moderate. Max Walloch, 42 Delancey street, New York City. Mar. 16

By a young man thoroughlyl acquainted with stove and hardware trade as CLEVELAND AGENT for some good manufacturer; A1 references furnished. "Hamlin," 219 Superior street, Room 1, Cleveland, Ohio. Mar. 16

Steady job wanted by a first-class PLUMBER and GAS FITTER; fair knowledge of steam and hot water fitting; married; temperate; good reference; New England States preferred. "J. H. C.," 1101 Chalkstone avenue, Providence, R. I. Mar. 16

As SUPERINTENDENT or FOREMAN in a first-class reliable sheet metal and cornice concern, by a young man 32 years of age, with executive ability, having a thorough knowledge of sheet metal work of all kinds—viz., cornice, skylight, roofing, ventilation (by natural or mechanical means), coppersmithing and spinning; also plumbing, hot water, hot air and steam heating; am able to make drawings, details, specifications and estimate on above work; reference from present employer. "W. H. D.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

By a sober, industrious, married man, who has had 20 years' experience at the cornice trade, the last nine years as cutter and foreman in a shop working from 20 to 30 men, having entire charge, doing estimating, buying, &c.; at liberty after April 1. "M.," No. 316, office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

By a TINNER, out of New York City. John Walsh 304 East Fifty-ninth street, New York City. Mar. 16

By an experienced GALVANIZER; thoroughly understands the business in all its branches; can furnish best of references. "Galvanizer," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 16

By a first-class CORNICE, SKYLIGHT and JOB WORKER, CUTTER and DRAFTSMAN; can estimate from plans, take charge of any number of men and handle to the best advantage. "Cornice Cutter," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 16

By a PLUMBER and LEAD WORKER, in the the country; best of city references. Robert Edgeworth, 12 Commerce street, New York City. Mar. 16

As FOREMAN by a cornice maker, draftsman and pattern cutter; long experience; best of references; German; middle aged. "A.," No. 316, office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

By a good METAL WORKER who understands the gas fixture business; 25 years' experience; best of references. "G. D.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

By a TINNER who understands all branches of the trade, such as assortment job work, roofing, furnace, gasoline stove and pump work; 11 years' experience; 28 years of age; best of references as to character and ability. "Tiuner," Box 353, Fowlerville, Mich. Mar. 16

By a TIN and SHEET IRON WORKER; 13 years' experience; understands all outside work, gutters, roofing, stove, range and fire place heater work and general jobbing; city or country. L. Saltzman, 858 Charlotte street, Philadelphia, Pa. Mar. 16

By a young man who has had four years' experience at the tinner's trade and who is also a practical roofer; temperate and reliable; steady employment desired in city or country. "L. K. W.," P. O. Box 45, Madalin, N. Y. Mar. 16

SALESMAN of middle age, good appearance, and liberal education, with ten years' experience as bookkeeper in a New York machinery store, and one year as salesman in a stove store, wants employment; salary, $15. "E. P. M.," Box 390, Westville, Conn. Mar. 16

By a licensed PLUMBER with five and one-half years' experience; a knowledge of steam and hot water heating; best of references; city or country. "Plumber," Lock Box 1300, Greenfield, Mass. Mar. 16

By a first-class PLUMBER and GASFITTER, at new work and all kinds of jobbing; city or country; wages moderate; eight years' experience; strictly temperate; not afraid of work. "G. F. R.," 510 East Eighty-fourth street, New York City. Mar. 16

By a TINSMITH; first-class mechanic at every branch of the trade; capable of taking charge of shop; strictly temperate; steady position desired; city or country. L. Teitelbaum, 44 Willett street, New York City. Mar. 16

At CORNICE WORK, TIN, SLATE ROOFING, FURNACE and HEATER WORK; can estimate on plans and specifications; 27 years' experience; sober and reliable; steady employment desired; city or country; German. "C. W.," care of J. Ryan, Williamsbridge, New York City. Mar. 16

By a JAPANNER, who understands all branches of the japan business, and how to handle cheap help; 15 years' experience as foreman; first-class references. "Japanner," office *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

As FOREMAN, by a first-class cutter and draftsman in cornice shop; can estimate from plans and give good reference. Box 702, Hastings, Neb. Mar. 16

As SUPERINTENDENT or FOREMAN of stove foundry, by an experienced and well qualified man, who thoroughly understands his business; can also sell and make contracts; will work for a reasonable salary or for share of the profits. "W. E. O.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

By a practical STEAM and HOT WATER FITTER; can make estimates and draw working plans for any kind of work in the heating line; would like steady position; can furnish satisfactory references. C. J. Taylor, Bellefonte, Pa. Mar. 16

By a first-class PLUMBER, with license; can do tin and sheet iron work. Box 341, Hyannis, Mass. Mar. 16

By a young man as TINSMITH, accustomed to inside and outside work; inside work preferred; wages moderate; steady job desired. Thos. Wall, 200 Navy street, Brooklyn, N. Y. Mar. 16

By a PLUMBER and GAS FITTER, also a stove and range repairer; first-class jobber; six years' experience; wages moderate; city or country. A. Yach, 718 Second avenue, New York City. Mar. 16

In the country by a TIN and SHEET IRON WORKER; 16 years' experience. Henry Newburger, 212 Eldridge street, New York. Mar. 16

By a FOUNDRYMAN; thoroughly understands the manufacturing of stoves, ranges, &c., in all branches; 24 years' experience, six years as foreman of molding department and eight years as superintendent and traveling salesman with late employer; reference. "B.," 927 Elm street, Peekskill, N. Y. Mar. 16

By a PLUMBER; four years' experience; city or country; good habits; wages $2 a day. Schilling, Olean, N. Y. Mar. 9

By a PLUMBER; six years' experience; can do all kinds of jobbing; wages moderate; steady and sober. Thomas F. Burke, Box 45, West Winsted, Conn. Mar. 9

By a first-class practical GALVANIZER, TINNER and RETINNER of gray cast ironware, malleable and wrought ironware and tinplate stamped ware with a brilliant coating; also capable of building the kettles; sober and reliable. Wm. Davies, 43 and 45 Lenox House, Brooklyn, N. Y. Mar. 9

Special Notices.

FOR SALE.

A rare chance to buy a paying Stove and Tinware store in a finely located New England town. Have a good Steam Fitting, Plumbing, Tin and Sheet Iron trade. Good reasons for selling. Address

"RARE CHANCE," No. 314,
office of *The Metal Worker*, 96-102 Reade St., New York.

TO RENT.

Desk room and part of our large and well lighted store and basement.

SMITH & ANTHONY CO.,
56 Beekman St., New York City.

FOR SALE.

A tin, stove and hardware business, doing a good trade, will be sold for cash at a reasonable price; good reasons for selling. Address

"REASONABLE,"
office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE or TO LEASE.

An established Plumbing and House Furnishing business at Narragansett Pier, R. I. Inquire of W. H. GRIFFITH & CO., on premises, or address D. D. CLARK, Westerley, R. I.

FOR RENT.

Space in sample room wholesale store house; good location, Chicago.

"R. J.,"
office of *The Metal Worker*, 59 Dearborn Street, Chicago.

WANTED.

Second-hand **Wire Ring Machine** Address

T. H. FARLEY,
Elmira, N. Y.

FOR SALE OR EXCHANGE.

A 6-foot Robinson Cornice Brake for sale, or will exchange it for one 8 or 10 feet long of the same make; is in good condition. Address

CHRISTIAN OFF & CO.,
230 East Washington St., Indianapolis, Ind.

FOR SALE.

A well selected stock of Hardware in a live Pennsylvania lumber town. Stock inventories $2500. Sales last year were over $14,000. No other hardware store or tin shop within 18 miles. The best of reasons for selling. Address

"BALLINTINE,"
Lamont, N. Y.

FOR SALE.

The proprietor of a well equipped Stove Foundry, being engaged in another business to which he is required to give most of his time, desires to dispose of the foundry. Melting capacity, nine tons. Very favorably situated as to supply of material and labor and with splendid facilities for distributing to any section of the country. Address "FOUNDRY," Box 39, office of *The Metal Worker*, 96-102 Reade St., New York.

WANTED.

One second-hand Power, Arch or Pillar Press. Weight from 4000 to 6000 pounds. For stamping or lettering two cross tin. Size of opening in bed about 16 in. x 22 in. Must be in good condition. Send illustration with lowest price.

SENSEMAN & BRICKENSTEIN,
Salem, N. C.

WANTED.

One second-hand No. 2 Moore's Double Seamer, also one Bell Edger. Both must be in good condition. State price. Address A. WATSON, East Liverpool, Ohio.

FOR SALE.

No. 7 Sturtevant Blower, only short time in use. Address

EUGENE MUNSELL & CO.,
218 Water St., New York.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

G. & J. R. BOLTON HEATERS.

HOT WATER.



STEAM.

The Foskett & Bishop Co.,

MANUFACTURERS.

The Best Heating Apparatus in the World.

END FOR PRICES, ETC.

New Home HOT AIR FURNACES.



NEW HOME FURNACE CO.,
NORWALK, CONN.

SALESROOM:

George H. Raymond, Manager, 114 Liberty St., New York.

Special Notices.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

WANTED.

To open correspondence with parties in Chicago or West who can handle Hot Air Furnaces and Hot Water Heaters in carload lots. Goods of Eastern manufacturer and well known. Address

"HOT AIR,"
office of *The Metal Worker*, 96-102 Reade St., New York.

WANTED.

Line Hard Coal Base Burner for season '95 by stove manufacturing company not making them, to handle in connection with their own, who thoroughly and actively canvass the territory of Ohio, Indiana, Michigan, Illinois and Wisconsin. Address

"HARD COAL,"
office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

Cast Iron Patterns of Furnaces, Ranges and Fire Place Heaters as follows: 11 sizes Furnaces, 4 sizes Ranges, 1 size Fire Place Heater. Address

ALVA HUBBARD & CO.,
Baltimore, Md.

Special Notices.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

FOUNDRY FOR SALE

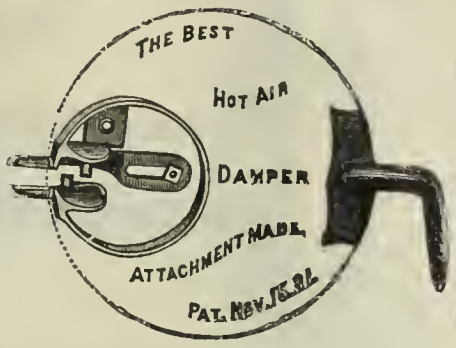
Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first class foundry.

Address

"STOVE FOUNDRY,"
Office of *The Metal Worker*, 96-102 Reade Street, New York.

Crown Damper and Crown Damper Attachment.





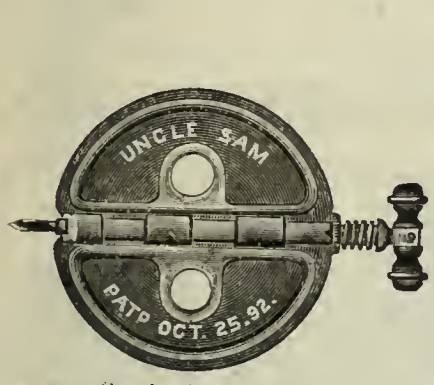
NICKEL PLATED HANDLE. **PUT UP 1 DOZ. IN A BOX.**

—MADE BY—

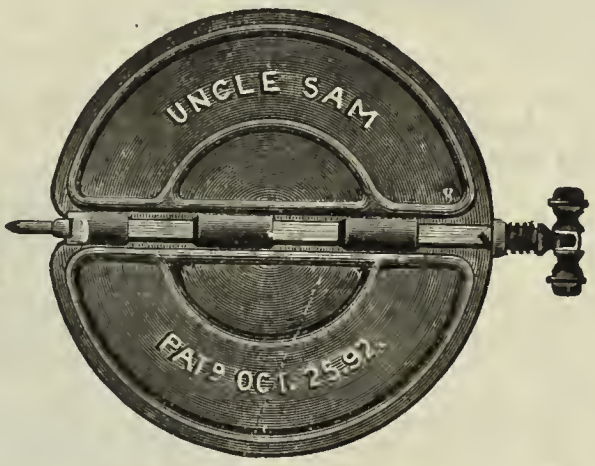
W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

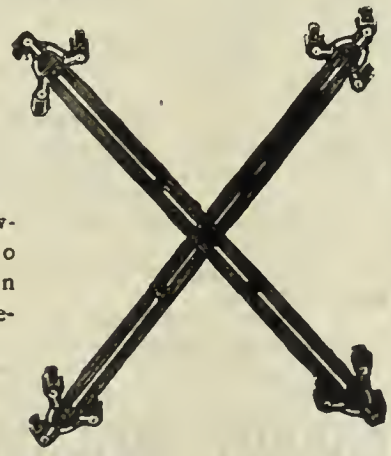
Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers



THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.



Gray Iron Castings,

Cheap Heating Stoves,
Diamond Thimbles.

S. CHENEY & SON,

MANLIUS, N. Y.



This little Torch is 4 in. high and 1¼ in. diam. and is designed to do away with the greasy candle. Will burn gasoline or kerosene oil.

Sold by All Jobbers.

Kendrick Valve & Washer Co.,

SYRACUSE, - N.Y.



The largest and best assorted stock in America. All requisites for the draughting room. We have made a study of this line and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable.

CATALOGUE ON APPLICATION.



SOMETHING NEW.

The Little Giant Steel Truck. Strong, Light.

ENTIRELY OF

METAL AND AT A VERY LOW PRICE.

Write for Circulars and Prices to the Manufacturers,

THE G. L. VAN NAMEE MFG. CO.,

Gouverneur, N. Y., U. S. A.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.

PATENT PRACTICE EXCLUSIVELY.

References Furnished on Application.

E. B. STOCKING, Attorney at Law, 611 F ST., N. W., WASHINGTON, D. C.

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law, Solicitors of Patents.

OFFICES:

PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row.
WASHINGTON,
Atlantic Building, 928 F. St.

Gas-Lighting and Gas-Fitting,

—INCLUDING—

Specifications and Rules for Gas Piping, Notes on the Advantages of Gas for Cooking and Heating, and Useful Hints to Gas Consumers.

By WM. PAUL GERHARD.

A pocket-book for gas companies, gas engineers and gas fitters, for manufacturers of gas fixtures and dealers in gas appliances, for gas consumers, architects and builders, health officers and sanitary inspectors.

Second Edition, Rewritten and Enlarged.
16mo, boards, 50c.

Sent, post-paid, on receipt of price by

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade St., New York.

Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10 inches, Cloth. Price, $3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

CONTENTS:

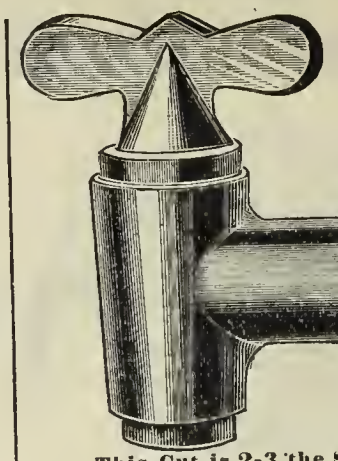
Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Sauce pans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set fo Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS,

Publisher,

96-102 Reade St., NEW YORK.



This Cut is 2-3 the Size of Faucet.

CLARK'S NEW FAUCET

— FOR —

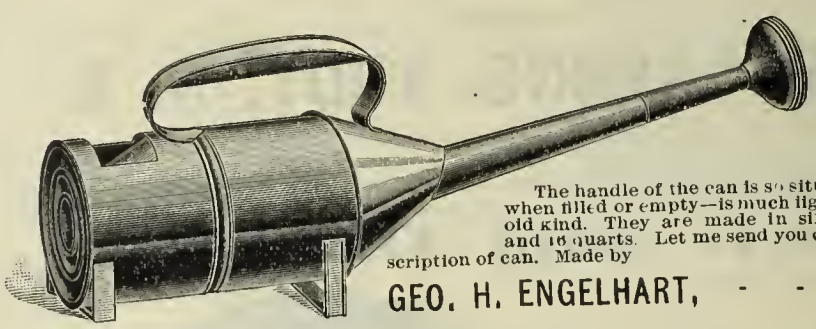
MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY

The Clark Novelty Co.,

ROCHESTER, N. Y.



The Standard Watering Pot.

The handle of the can is so situated that it balances when filled or empty—is much lighter to carry than the old kind. They are made in six sizes—6, 8, 10, 12, 14 and 16 quarts. Let me send you circular giving full description of can. Made by

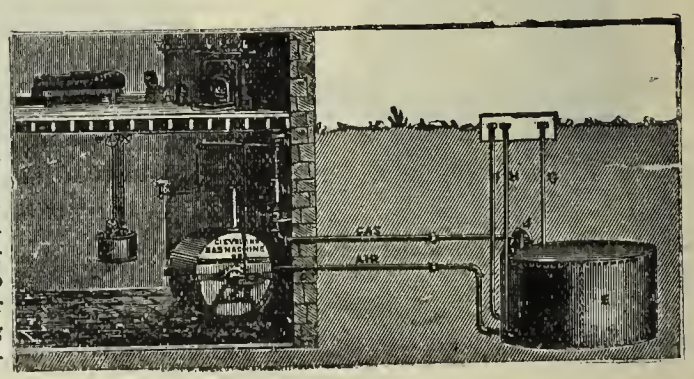
GEO. H. ENGELHART, - - Glenville, O.

CLEVELAND GAS MACHINE CO.

82 Champlain St., Cleveland, Ohio.

Please send for **Reduced Price List and Catalogue.**

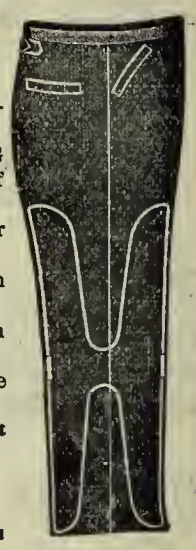
We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engives.





Before. After.

Covert Pants Stretcher.



THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

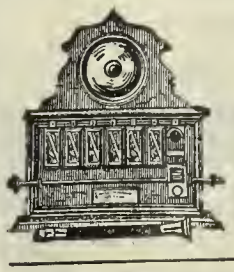
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

MANUFACTURED ONLY BY

COVERT MFG CO., West Troy, N. Y.



W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.

Manufacturers of

Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brookiyn, L. I. Catalogues on application.



DATO 1892 CORRUGATED CONDUCTOR HOOKS AND **TINNERS' SUPPLIES**

SEND FOR CATALOGUE 59 NTH 2ND ST

L.D.BERGER. PHILADA PA

THE TRIUMPH COOKER,

WITH LOCK COVER.



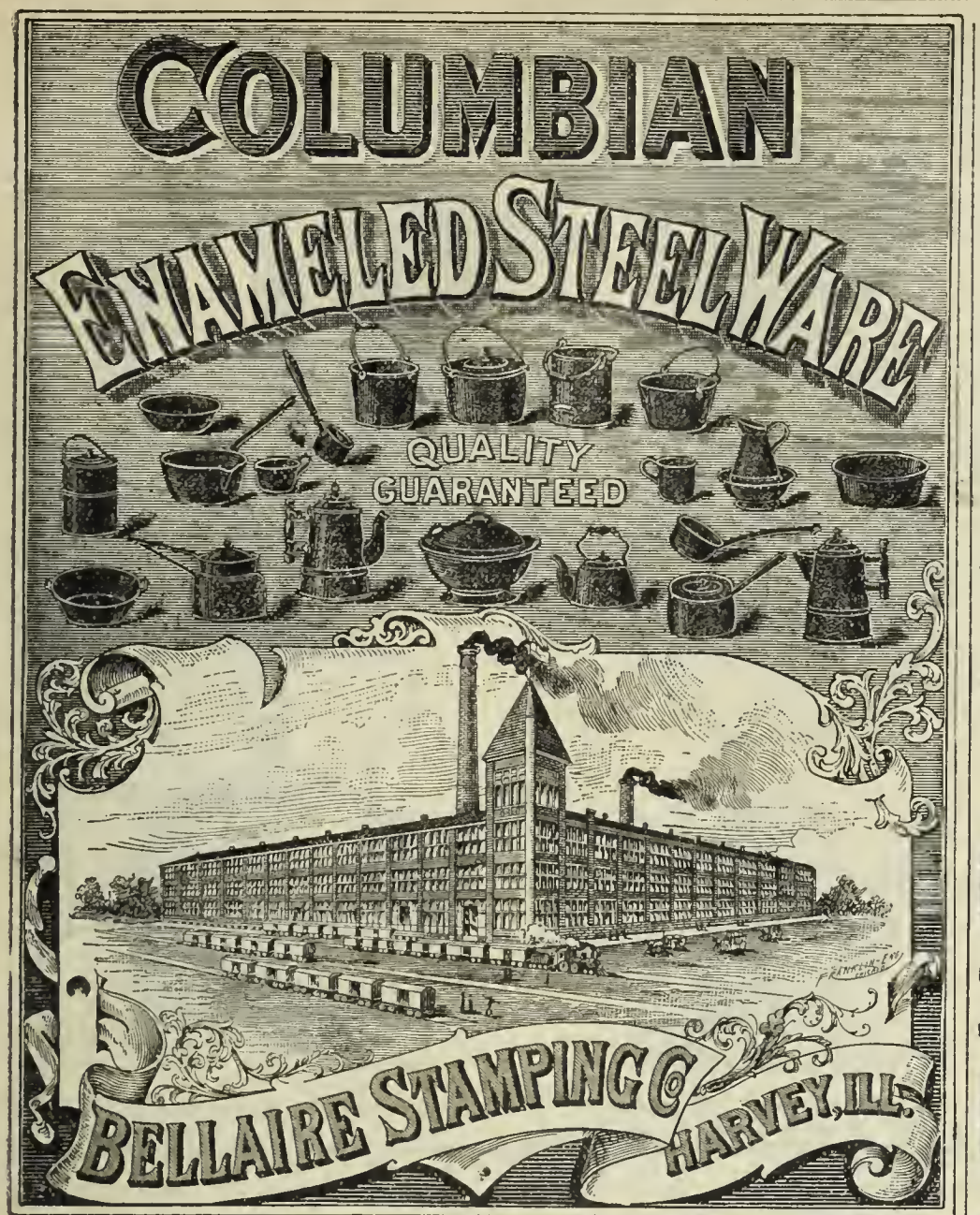
STEAMLESS, ODORLESS AND NON BOIL-OVER.

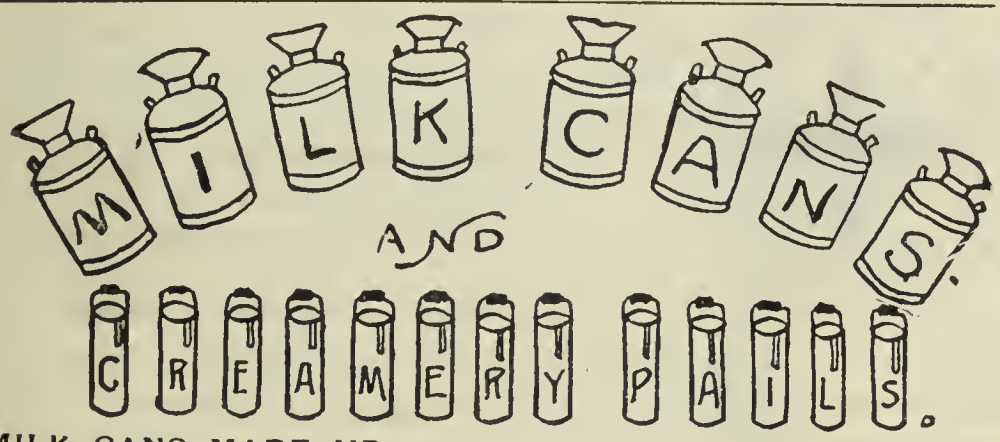
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.

A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.

THE HARTFORD HOLLOW WARE COMPANY,

HARTFORD, CONN.





MILK CANS MADE UP.
MILK CAN STOCK.
CREAMERY PAILS MADE UP.
CREAMERY PAIL TRIMMINGS.

Railroad Milk Cans, City Milk Cans Factory Cans.

Illustrations and Prices sent upon application.

SIDNEY SHEPARD & CO.,
BUFFALO, N. Y.

C. SIDNEY SHEPARD & CO..
CHICAGO, ILL.

Proprietors of the BUFFALO STAMPING WORKS.

CHAS. C. CHASE, JR., Philadelphia Sales Agent, Room 320, 423 Chestnut St.
C. W. WELLS, New England Sales Agent, 19 Pearl St., Boston, Mass



ALUMINUM

Ingots, Sheets, Rods, Tubes, Wire and Castings,
Cooking Utensils and Tableware,
Tea and Coffee Pots, Chafing Dishes, Rice Boilers, &c.
Write for New Catalogue.

THE WOHLER ALUMINUM COMPANY,
55 Jackson Street, - - - - Chicago, Ill.

ROYAL
WASH BOILER HANDLE.



PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

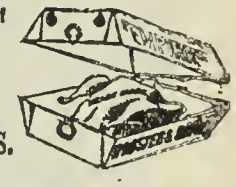
The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,
116 N. 2d St., PHILADELPHIA, PA.

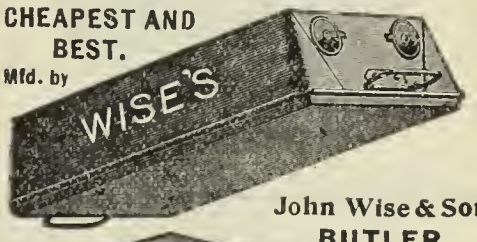
NEW YORK ELBOW CO.,
18 Cliff St., N. Y. City.



Makers of
Elbows
AND
Roasters.



CHEAPEST AND BEST.
Mfd. by



John Wise & Son,
BUTLER,
O.



— MAUDE: "Yes, I am obliged to have my shoes made to order. My left foot is larger than my right."

Ethel: "Is it possible?"—*Exchange.*

— IRISHMAN, watching gun club: "Be jabers! 'nd pwhat's the use 'n wastin' foine powder 'n shot on thim clay t'ings? Shure the fall ud break 'em, ony how."—*Yale Record.*

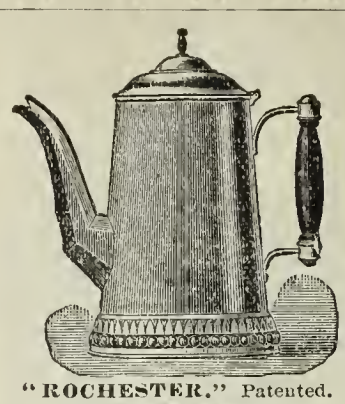
— WHEN a man moves out to California he always shows just as much pride in the climate as if he were responsible for it himself.—*Exchange.*



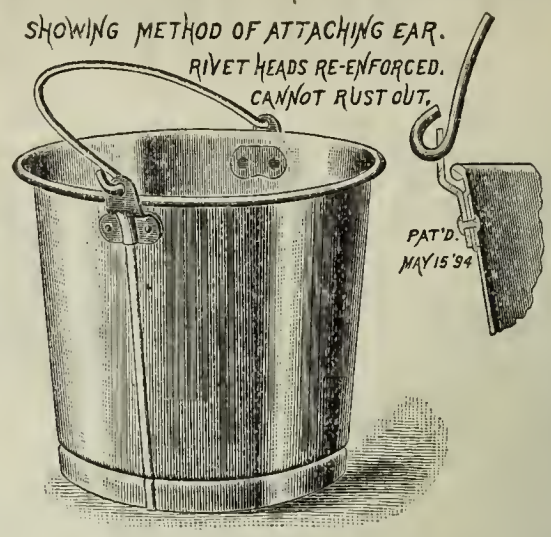
Cold Rolled Copper.



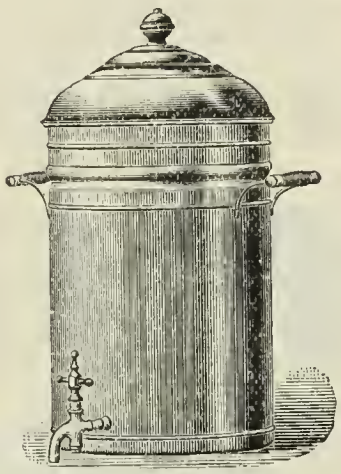
LATEST "ROCHESTER."
Patent pending.
White Satin Finish Inside.



"ROCHESTER." Patented.



ROCHESTER STAMPING WORKS, Rochester, N. Y., STILL MAKE NO TIN COVERS ON ANY OF OUR PLATED WARE. Better Goods Than Ever.



"ROCHESTER" COFFEE URN.
Extra Heavy Copper, Nickel Plated.
Cold Handles, Riveted on.



"ROCHESTER." Patented.



"ROCHESTER" OLD STYLE.
EXTRA HEAVY.
White Satin Finish Inside.

The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O.

ANTI-RUSTING C. S. Mf'g Co. WARRANTED.

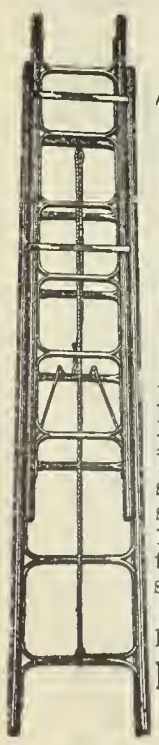
WE WISH IT distinctly understood by all the hardware dealers, and also dealers in Tinware, throughout the United States that the

CLIFTON SPRINGS MANUFACTURING COMPANY,
CLIFTON SPRINGS, N. Y.,

is still in existence, shipping large quantities of the

Evans Patent Anti-Rusting Tinware

(trade-mark, a Greek Cross), notwithstanding the base falsehoods heralded about the country by the salesmen of our competitors.



Look at this Ladder.

THE PATENT BENT RUNG LADDER.

The Strongest, Lightest and Best Ladder Made.

A sixteen-foot ladder only weighs 21 pounds. Extension ladders of this kind are easily put up and taken down by a boy. Our double and single step ladders have no equal. A six-foot step ladder will carry 1000 pounds, and will last three times as long as the old style step ladder.

Write for catalogue and price-list.

Indiana Ladder Co.,
INDIANA, PENNSYLVANIA.

WEST'S DUST PAN,



Patent applied for.

the daintiest, handsomest, cleanest, cheapest and most convenient Dust Pan in the world.

You see, I don't have to get on my knees or break my back or split my dress, etc., stooping, or smother myself with dust when using this Dust Pan.

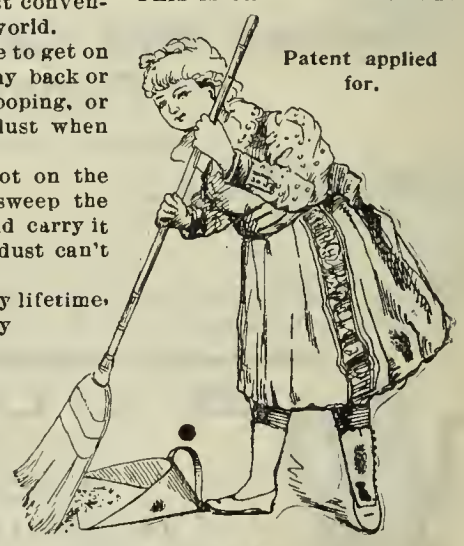
I just place my foot on the tread, thus, while I sweep the dust into the pan and carry it away like this, so the dust can't spill out.

I guess it will last my lifetime, although it costs only ten cents.

For sale by all jobbers.

Write for Prices.

This is our new Dust Pan.



Patent applied for.

JAS. R. WEST, Man'f'r, - - Cas City, Ind

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

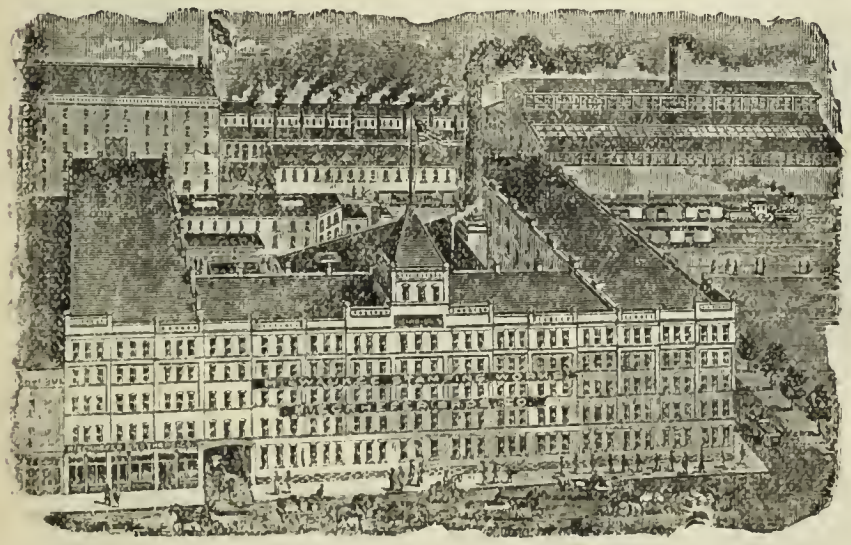


Agents for SPLENDID OIL COOKING STOVES
and MAJESTIC OIL HEATING STOVES

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED,
JAPANNED AND ENAMELED
PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.

American

WAFFLE IRONS.

The Best for Gas or Gasoline Stoves Easy to Clean. Long Wood Handles.

Buy no Other.



"ERIE" HOLLOW WARE LEADS, ALL OTHERS FOLLOW.

ALSO COMPLETE ASSORTMENT OF

FULL NICKEL PLATED WARE,

UNSURPASSED IN FINISH.

"ERIE" ALUMINUM CAST WARE,

THE FINEST WARE EVER MADE. IT WILL PAY YOU TO HANDLE IT.

NEW GOODS FOR SPRING TRADE.

SEND FOR NEW CATALOGUE.

Try our Improved Double Broiler for Gas or Gasoline Stoves.

GRISWOLD MFG. CO., Erie, Pa.



"ERIE" ALUMINUM.

SOLE MANUFACTURERS OF GRANITE IRON WARE

St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, etc.

"A FULL LINE AND SUPERIOR GOODS."

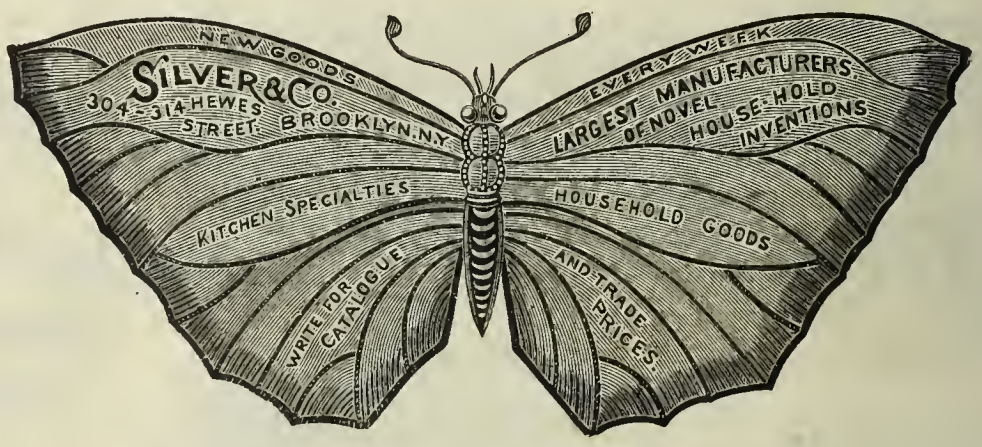
Write us for Catalogue and Prices.



ROME MFG. CO., Rome, N. Y.

New York Store, 92 Walker St.





EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES.

"MARION HARLAND" Tea and Coffee Pots and Urns.

Royal and Crown Roasters and Bakers

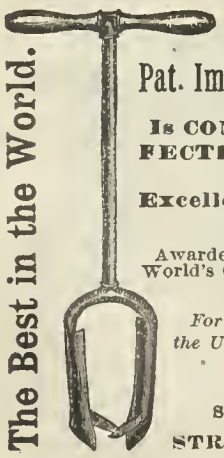
Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses,

Steam Cookers, Milk Sterilizers, Bread and Cake Pans,

Display Stands and Household Novelties.

The Best in the World.



IWAN'S

Pat. Improved Post Hole Auger

Is CONVENIENT and EFFECTIVE IN OPERATION.

Excellence of Material and Construction.

Awarded Medal and Diploma at the World's Columbian Exposition, 1893.

For sale by all leading jobbers in the U. S. and Canada.

IWAN BROS.,

SOLE MANUFACTURERS,

STREATOR, - ILL.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

CREAM CANS

. . . AND . . .

Cream Can Trimmings.



Cream Cans

With Plain Covers.
With Deep Covers.
With Extra Deep Covers.
Self Locking.

Fairmont Cream Can Gages.



Cream Can Trimmings.

Cream Can Bottoms—IX, IXX, IXXX.

Cream Can Covers—Plain, Deep, Extra Deep.

Self Locking Trimmings—Ears and Lugs; Ears, Lugs and Bails

The Geuder & Paeschke Mfg. Co.
Manufacturers,
MILWAUKEE, WISCONSIN.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

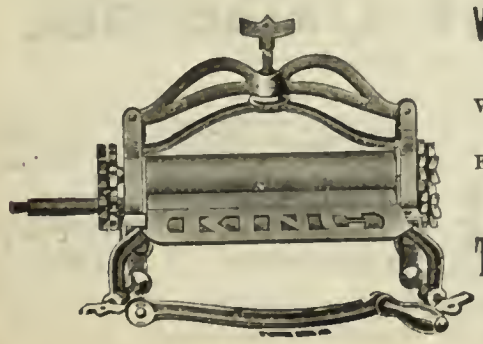
A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.



Weight, 16 ounces. Can be sold in all seasons.
Length, 10 inches.

Write to Manufacturers for Prices.

WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr
Boston Office, H. F. Livermore & Co., 34 Oliver St.

"We are Advertised by our Loving Friends."



Pat. Jan. 19th. 1895.

Look Here,

Hardware and Housefurnishing Dealers. An article you **must** keep is the wonderfully popular

Crusty Bread Pan.

The most perfect bread baker ever made. Every lady trying it acknowledges that. **Tests make customers** for this pan, and **that is a fact.** The Clark-Sawyer Co., a big Department Store of Worcester, Mass., say: "They are a good thing, and will make their own way, if people can be made to give them a trial." Your jobber must be in the list below. Write them for prices. They all carry this popular pan in stock.

MADE ONLY BY

The Niles Mfg. Co.,

NILES, OHIO.

HIBBARD, SPENCER, BARTLETT & CO., HORTON, GILMORE, McWILLIAMS & CO., Chicago, Ill.
WM. FRANKFURTH HARDWARE CO., JOHN PRITZLAFF HARDWARE CO., Milwaukee, Wis.
FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.
R. D. CONE CO., Winona, Minn.
A. F. SHAPLEIGH HARDWARE CO., St. Louis, Mo.
RICHARDS & CONOVER HARDWARE CO., Kansas City, Mo.
WYETH HARDWARE & MANUFACTURING CO., St. Joseph, Mo.
THE GEORGE TRITCH HARDWARE CO., Denver, Colo.
EMPKIE-SHUGART CO., Council Bluffs, Iowa.
SICKELS, PRESTON & NUTTING CO., Davenport, Iowa.
A. BALDWIN & CO., Limited, New Orleans, La.
FITTEN-THOMPSON HARDWARE CO., Atlanta, Ga.
PHILLIPS & BUTTORFF MANUFACTURING CO., Nashville, Tenn.
STRATTON & TERSTEGGE, Louisville, Ky.
THE F. H. LAWSON CO., Cincinnati, Ohio.
VAN CAMP HARDWARE & IRON CO., Indianapolis, Ind.
STANDART BROTHERS, Detroit, Mich
THE GEO. WORTHINGTON CO.,
THE McINTOSH-HUNTINGTON CO., Cleveland, Ohio.
L. H. SMITH WOODEN WARE CO., Limited, Pittsburgh, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
CHARLES MILLAR & SON, Utica, N. Y.
BARKER, ROSE & GRAY, Elmira, N. Y
SHIELDS & BROTHER, Philadelphia, Pa.
C. S. MERSICK & CO., New Haven, Conn.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.



SELF LUBRICATING

Rotary Screw Ventilators

WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

46 Cortlandt St., New York

☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

215 North 2d St., - - - Philadelphia.

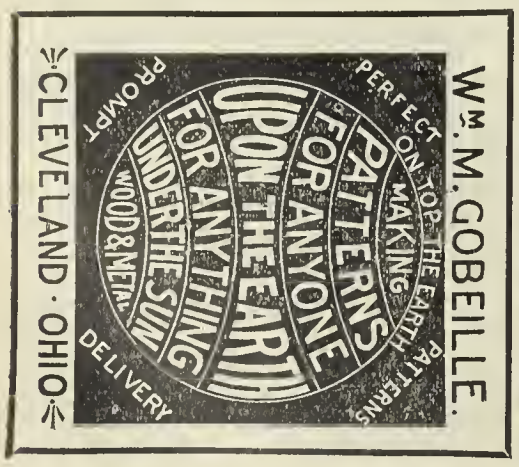
FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.



FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers' original patterns.

MICA.

STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH

WHEN HE SAYS THAT THE

RUTLAND LINING

FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.



"FIRESTONE"

Has proved I self to be far superior to all others, as the most retractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



Designers of national reputation. Superb mechanical facilities.

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

When In Need of

FINE STOVE PLATE FACINGS,

Write to the **originators** and **headquarters** for prices and trial samples.

THE S. OBERMAYER CO., - - - - **Cincinnati, O., and Chicago, Ill.**

MANUFACTURERS OF

Foundry Facings, Supplies and Equipments. Importers and Refiners all grades Plumbago.

Catalogue and special circulars sent on application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE CONNECTICUT PLATING CO.,

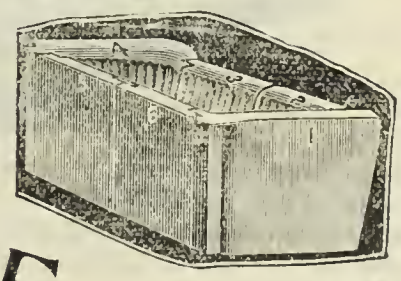
No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work. Estimates cheerfully submitted.

McLEOD & HENRY Co. TROY N.Y.



Fire Brick Linings A SPECIALTY.

— SHE KNEW HIM.—Mr. Brown: "I've got a cold or something in my head."

Mrs. Brown: "It must be a cold, dear, I'm sure."—*Exchange.*

— DELSARTE.—Teacher: "How do you indicate grief?"

Pupil: "By burying the face in the hands."

Teacher: "How bashfulness?"

Pupil: "By burying the hands in the face."

— THE —

KELLY SHOWER BATH RING.

Patent Applied For.



It Will Produce Better Results Than a $100 Shower Bath.

For particulars write

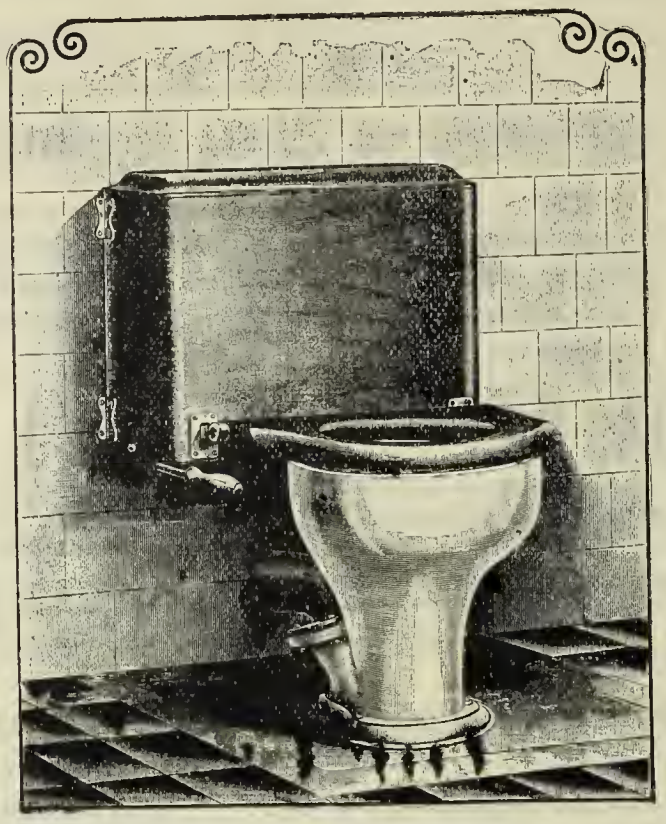
Thos. Kelly & Bros.

Manufacturers of Permanent Plumbing Goods,

124 Franklin St. CHICAGO.

AN IMPORTANT FIXTURE.

A new Water Closet for Hospitals, School Houses and Public or Private Buildings.



THE

Puritan Wash-Down Water Closet.

PATENTED.

WHY THE PURITAN WASH-DOWN IS BETTER THAN ANY OTHER FORM OF CLOSET.

It is simple and compact. The Tank being connected directly to the closet does away with unsightly pipes on the wall and reduces the noise to a minimum and at the same time being more effective and bas a larger surface of water. The joint where the eartbenware connects with the soil pipe is under water, which is an absolute safeguard against the leaking of sewer gas. It is especially adapted for fire-proof buildings, and the soil pipe can run on the floor either in front or behind the partition. There is no chance for stoppages and there are no concealed spaces, all parts being accessible.

The body of the closet is made of vitreous or non-absorbing ware and is perfectly sanitary.

GOOD FIXTURES ARE CHEAP, AND POOR FIXTURES ARE EXPENSIVE.

Each Closet is guaranteed for a term of years. Call and see the operation of the Closet at our **SHOW ROOM.**

DALTON-INGERSOLL COMPANY,

169 to 175 High Street (Fort Hill Square), Boston, Mass.

CHICAGO BRANCH : 65 Washington St., Institute of Building Arts.

NEW YORK AGENCY : C. Hoffman, Jr., 277 Pearl St

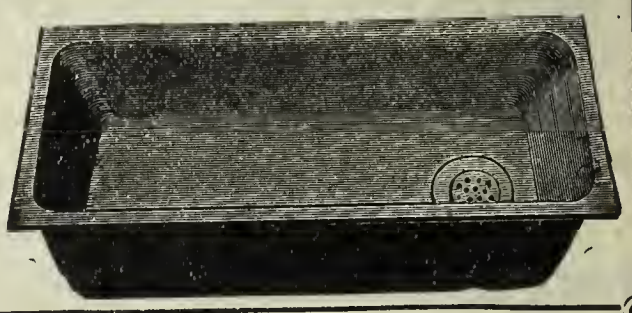


PLUMBERS EVERYWHERE

ARE ADOPTING THE

COLUMBUS AND NEW ERA WROUGHT STEEL

Sinks because they are superior in many ways to the old cast sinks. They are not porous, hence non-absorbent, and are in consequence free from smell and filthiness, etc.; light, cheap and made in all sizes and finishes. Write for price.

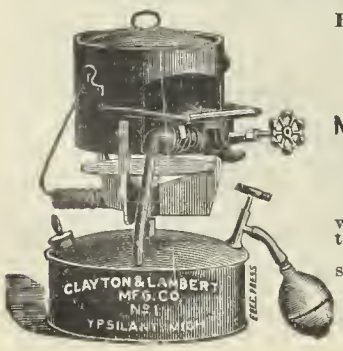


THE

Kilbourne & Jacobs Man'fg Co.

Columbus, Ohio, U. S. A.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

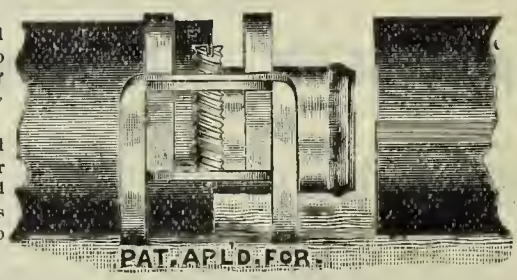
They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.

Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screwdriver being all the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust Sold by Jobbers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.

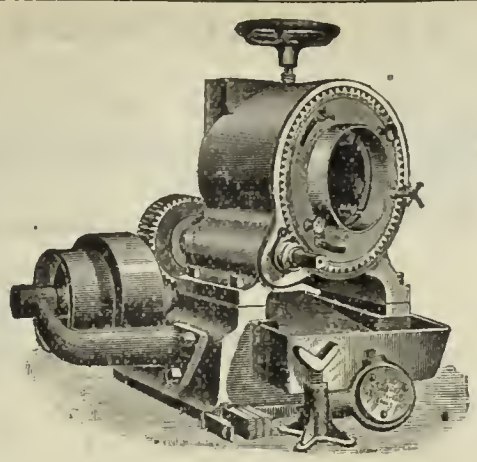
When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,

56 Garden Street. • Bridgeport, Conn.



No. 2 Hand or Power Pipe Threading Machine. Range 2⅛ to 4 inch R. H.

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

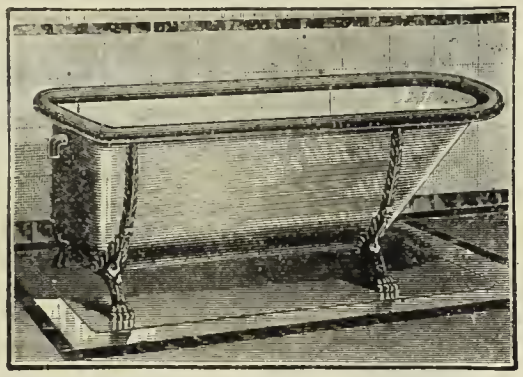
INEXPENSIVE.

It is so lined that it will not crack, nor split either can it rust.
No trouble at all to keep it clean, for it cannot harbor dirt nor vermin. It is an open sanitary fixture, no wood but the rim; unbreakable, light, artistic, low priced.
Don't buy an imitation—get the Steel Clad. All plumbers and jobbers have it, or the

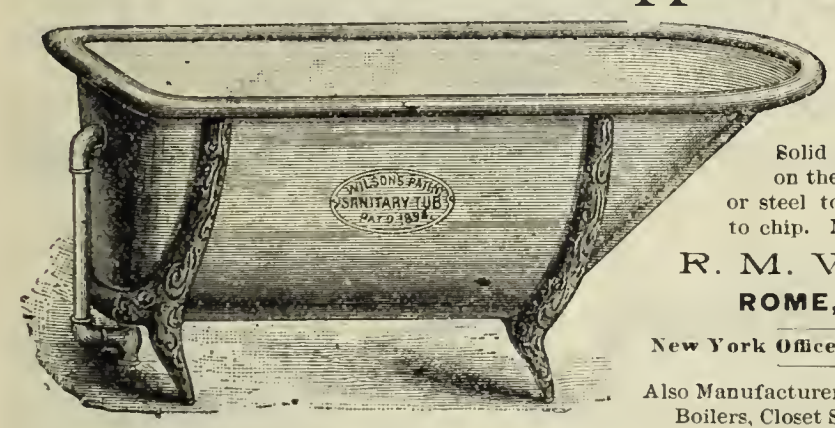
STEEL CLAD BATH CO. OF NEW YORK,
447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,
Detroit, Mich.
GEORGE BOOTH, President.

Better than the high priced ones, for a low price. Many styles and sizes, only one quality—the best.



R. M. Wilson's Solid Copper Bath Tub.



WRITE FOR CATALOGUE.

Success assured to all who handle the Wilson Patent Sanitary Bath Tub. The only Solid Copper Bath Tub on the market. No iron or steel to rust. No enamel to chip. Manufactured by

R. M. WILSON,
ROME, N. Y.

New York Office, 92 Walker St.

Also Manufacturer of Copper Range Boilers, Closet Seats and Tanks and Brass Work.



THE TRIPLE JET

SYPHON

Water Closet.

A Clean Fixture,
A Beautiful Fixture,
A Perfect Fixture,
A Sanitary Fixture,
A Durable Fixture.

Peck Bros. & Co.,

FINE SANITARY GOODS,

47 Cliff Street, New York
259 Wabash Avenue, Chicago.
65 Oliver Street, Boston.
127-37 Chestnut Street, New Haven, Conn



BROUGHTON'S

PATENT

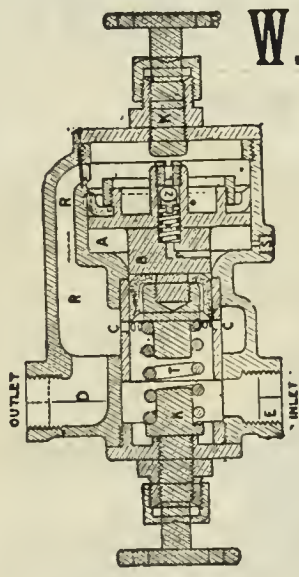
SELF CLOSING

BASIN COCK

EVERY ONE WARRANTED

Send for Circulars.

Stebbins Manufacturing Co., Brightwood, Mass.
SOLE MANUFACTURERS.



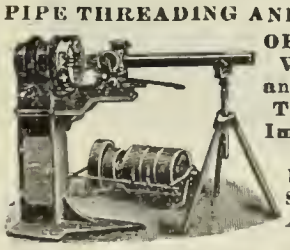
W. G. Taafel's Pressure Regulator.

Send for Price-List.

NEWARK REGULATOR COMPANY

Newark, Ohio.

PIPE THREADING AND CUTTING OFF MACHINES. WATER, GAS and STEAM FITTERS' TOOLS. Improved Hinged Vises, Pipe Wrenches, Stocks and Dies. *Acknowledged to be the Best.*



ARMSTRONG MFG. CO.,
N. Y. OFFICE: 139 Centre St.
Bridgeport, Conn.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 39th Street, NEW YORK.

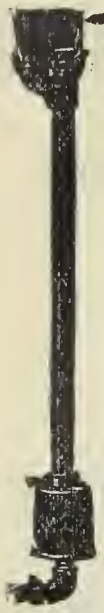
LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers
IMPROVED SANITARY WATER CLOSETS.
Wrought Iron Pipe of all sizes cut to order.

— HER AGE —She: "How old would you say I was?"

He: "Ur—well, I should say you were old enough to know better than think I would answer a question like that."

W. & B. DOUGLAS,



Middletown, Conn.

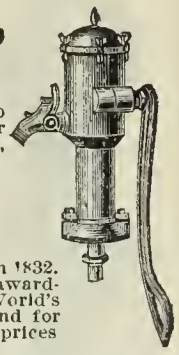
Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON,
156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices

MYERS REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

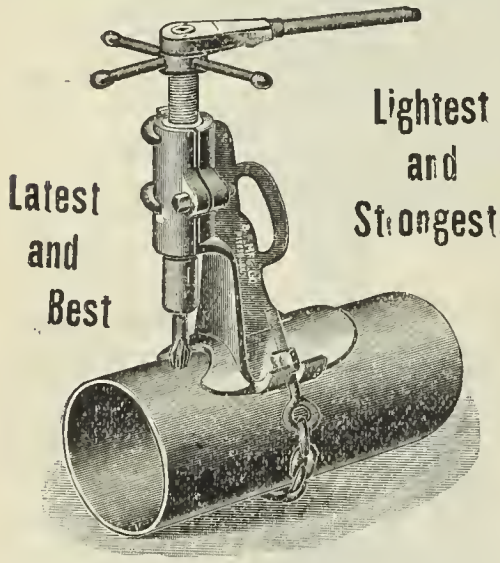
TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



Simple, durable, powerful, easy to operate never affected by frost. Patent GLASS VALVE, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.

—RAPID—
Pipe Tapping Machine.



Lightest and Strongest.

Latest and Best

A simple, effective and strongly built machine, by means of which any workman of ordinary intelligence can rapidly make service connection to any water or gas main without turning off the pressure or interfering with the consumer's supply of water or gas.

Price complete for ½, ⅝, ¾ and 1 in. connections, $100.00.

Liberal Discount to the Trade.

BAILEY-FARRELL MFG. CO.,

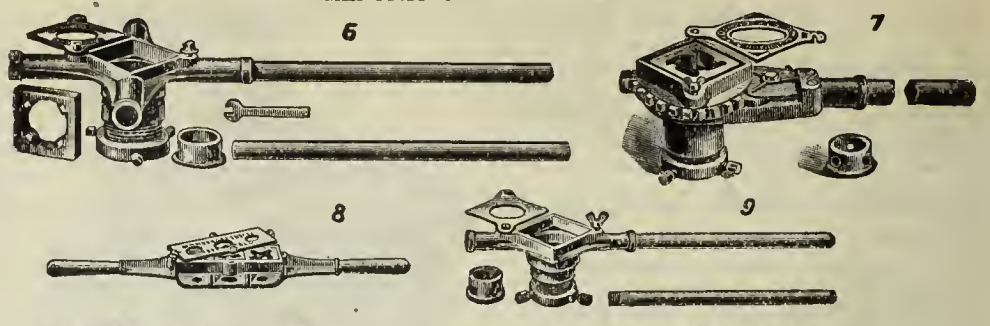
PITTSBURG, PA.



CHUCKS The National
All sizes and styles. Patented
Reversible Jaws. Illus. catalogue
The standard Chuck since 1882.
Address W. WHITLOCK,
39 Cortlandt Street, New York.

D. SAUNDERS' SONS.

MANUFACTURERS OF PATENT



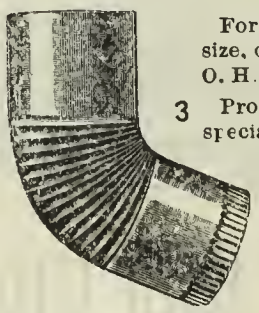
STOCKS AND DIES.

Threading pipe ⅛ inch to 6 inch; the larger sizes have CUTTING-OFF attachment. These tools are light, strong and of superior design and finish; also PIPE threading MACHINES ¼ inch to 16 inch hand or power. Send for catalogue to

27 ATHERTON ST., YONKERS, N. Y.

The "O.H." One Piece PLAIN ROUND and CORRUGATED
CONDUCTOR AND STOVE PIPE ELBOWS.

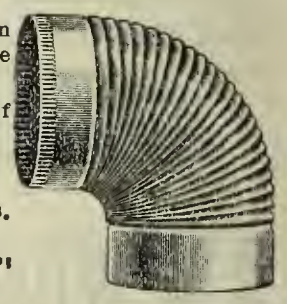
(PATENTED OCT. 25, 1892.)



For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.



For Sale by all First-class Jobbers.

THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.

ZERO VALVE CO.,

212 Seneca St.,

Buffalo, N. Y.

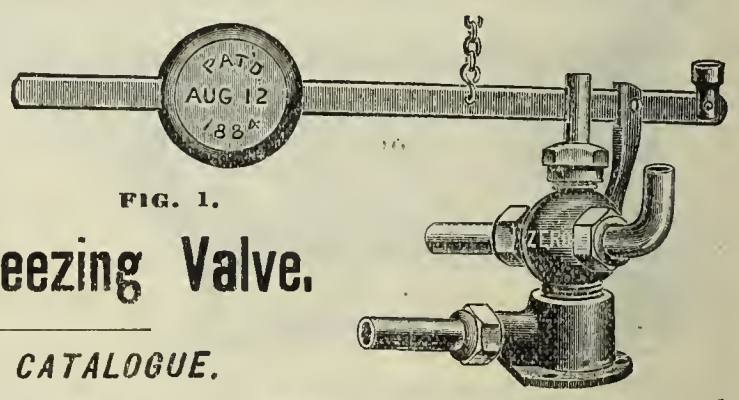


FIG. 1.

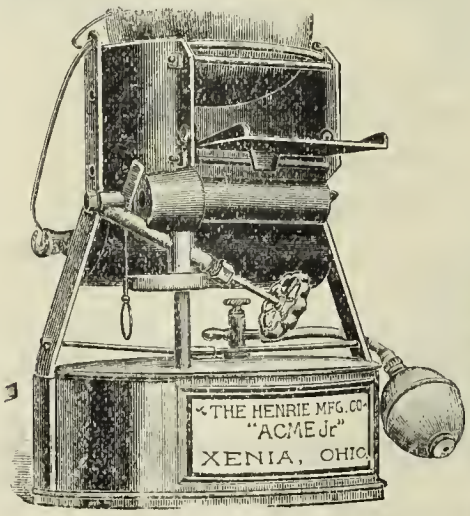
Zero Anti-Freezing Valve.

SEND FOR CATALOGUE.

ACME, JR.,

For TINNERS and PLUMBERS.

The newest, simplest and best of them all; will burn anywhere and positively won't leak. Can be used equally well for Melting Solder Joints, Heating Irons, Burning Paint, etc. Write for complete description and price Weighs but six pounds complete.



THE

HENRIE MAN'F'G CO.,

XENIA, O.

Helper Fire Pot

FOR PLUMBERS' AND TINNERS' USE.

A Combination of Fire Pot and Torch.



The only pot where the burner is on a swivel and patented.

The only fire pot with 16 gauge brass tank. All our goods guaranteed.

SEND FOR CATALOGUE.

UNION HEATER SUPPLY CO.,

88 Congress St, East, Detroit, Mich.

Don't Buy

*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

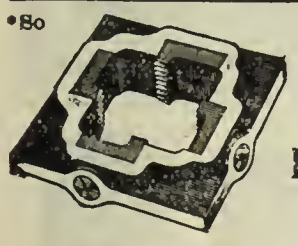
Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;

Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**

Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence of** quality.

If by chance you do not think these points, or the saving of money, objectionable,

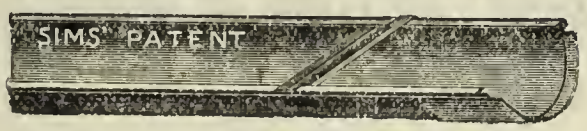
*Bo



Send us a Postal Note for 62 Cents (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, PA., U. S. A.
SEND FOR CATALOGUE OF THE "SKELETON" PIPE DIE

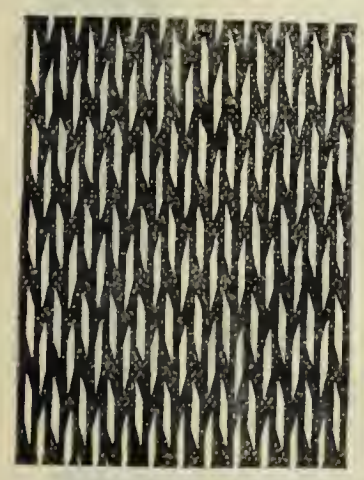
SIMS'S ADJUSTABLE EAVE TROUGH.



Pat. Jan. 14th, 1890.

Various Designs of Galvanized Sheet Steel Eave Troughs, Mitres, and Ridge Rolls, Roof Gutters, Expanding Conductors, Elbows, etc., etc.

THE SIMS MFG. CO. Sole Manufacturers, **NEWARK OHIO**



SHEET METAL LATH.

Improved METALLIC LATHING is now being used in construction of all modern buildings being FIRE-PROOF, RIGID, with ample keying qualities, and is easily applied, and embraces a material saving in plaster if necessary.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted and Corrugated Leader, cheapest and best in the market. Sheet iron piping, Stove Pipe and Fittings of every description.

General Galvanizing to Order.

The Jersey City Galvanizing Co. Manufacturers and Jobbers in

Galvanized Material of Every Description.

Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE OF OUR SPECIALTIES.



BURGESS GEM No. 6.

Electricians', Plumbers' and Tinners' Furnace.

GUARANTEED to melt 12 pounds of lead in eight minutes.

GUARANTEED to heat coppers and melt lead at the same time.

GUARANTEED that if it cannot be worked out of doors or on roofs in all kinds of weather your money will be refunded.

MANUFACTURED BY **Burgess Soldering Furnace Co.,**

COLUMBUS, OHIO.

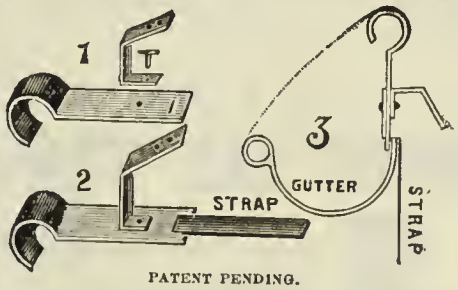


"Columbia" Wiping Cloths FREE!

Not free exactly from a financial standpoint (altho' very near it), but free from all defects due to **a Poor Quality of Ticking, Carelessness in Making and a Bungling Manner of Fastening the Ends.** A cloth free from the above defects is well worth the price we ask, 12 cents each, or six for 70 cents. Remember we make any kind—send us the size you want, giving the wiping edge first.

THE J. W. CHAMBERLAIN CO.,
Plumbing & Steam Fitting Specialties,
BANGOR, MAINE.

STRAP E. T. HANGER.



PATENT PENDING.

TINNER, ATTENTION!

Save the narrow strips of Galvanized Iron and Tin that you have been taking to the Dump, for the **Strap Hanger.** Any wide awake TINNER can see at a glance the saving. Cut No. 1 shows Hanger as they are packed—Gross in a Box. **$2.50 per Gross,** freight allowed.

Discount to the Trade.

MANUFACTURED BY

JOHN SEVERDING, - Richmond, Ind.



USE "OUR OWN" BASIN PLUGS.

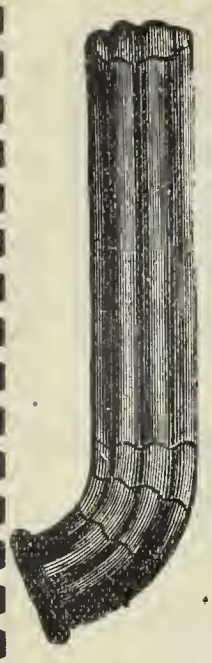
NO OTHER LETTERING ON THEM.

SAMPLE DOZEN ASSORTED $1.

Best Quality. Handsomely Nickeled.



H. O. CANFIELD,
MANUFACTURER OF
Moulded Rubber Goods,
BRIDGEPORT, CONN.



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



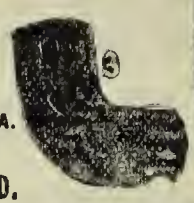
W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.



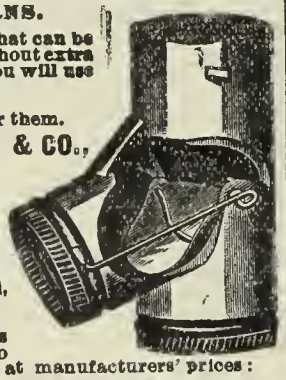


THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.

It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade. Ask your jobber for them.



COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

6-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.

THE BOWER

SEWER GAS TRAP.



A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

SIMPLE, CHEAP.

EFFECTIVE and DURABLE.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 48-page pamphlet sent free on application.

B. P. BOWER & CO.
Manufacturers,
Cleveland, Ohio

Leather and Rubber

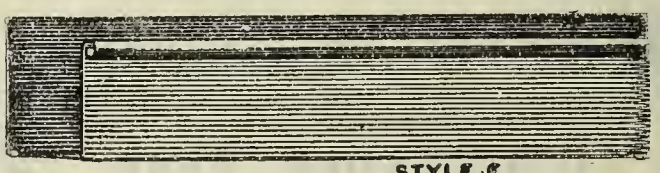
WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.





STYLE F.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

—MANUFACTURE—

PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

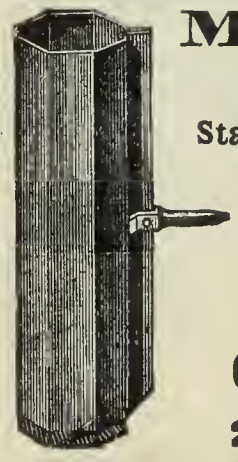
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,

(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

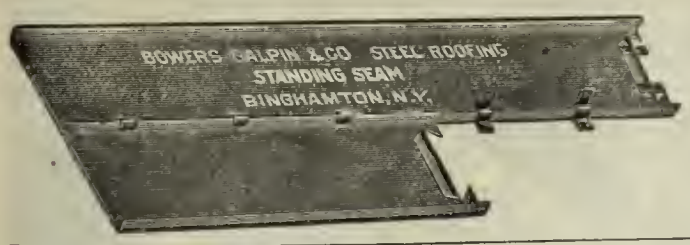
METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.

BOWERS ROOFING AND METAL WORKS.



Standing Seam and Roll Roofing.
Painted Steel, Terne and Galvanized.

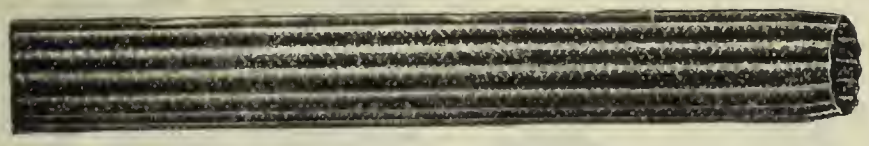
—MANUFACTURED BY—

L. M. BOWERS & CO., Binghamton, N. Y.

Eave Trough.



Conductor Pipe.



EAVE TROUGH, CONDUCTOR PIPE, &c.

DO YOU WANT the very best? If so addre s the manufacturers and receive their prices. They can save you money, as well as furnish you with superior goods, made on greatly improved machinery.

THE KANNEBERG ROOFING CO.,

CANTON, OHIO.

THE IRWIN & REBER
PATENT
EXPANDING WATER CONDUCTOR.
MANUFACTURED BY THE
S. S. S. Conductor Co.
LIMITED,
163 Lacock Street,
ALLEGHENY, PA.

THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

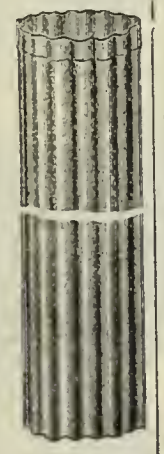
The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.



Corrugated Expanding Conductor

OF GALVANIZED IRON AND COLD ROLLED COPPER.





JAMES A. MILLER & BRO.,
129 and 131 South Clinton St.,
CHICAGO.



BERGER BROS.,
TINNERS' HARDWARE, ROOFERS' SUPPLIES,
231 AND 237 ARCH STREET, PHILADELPHIA.
GUTTER, GUTTER HANGERS, PIPE, PIPE FASTENERS,
LARGEST STOCK, GREATEST VARIETY, PROMPT SHIPMENTS.

Steel Brick Siding, Roll, V. Crimp and Corrugated Roofing, Genuine Russia and American Planished Iron, B. B. Galvanized and Black Iron, Sheet Zinc, Rivets, Bolts, Solder, Registers, Ventilators, Hods, Elbows, Ears, Handles, Valves and Plungers, etc.

GET IN LINE AND WRITE FOR PRICES AT ONCE; IT WILL PAY YOU.

SLATE FOR **ROOFING** AND BLACKBOARDS.
SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS.
AULD & CONGER,
100 EUCLID AVE., CLEVELAND, OHIO.



The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating burners.** It is a modern, perfected apparatus warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adjustable burners. Send for catalogue.

C. M. KEMP MFG., CO.,
BALTIMORE.

PATENTED

LONGEST EAVE TROUGH IN THE WORLD 10FT WITHOUT A SEAM

PRESSED STEEL BRICK

COMPLETE GALVANIZED

STEEL FRONTS

ROCK FACE BRICK AND STONE

CONDUCTOR

CORRUGATED IRON

NO SIR! YOU CAN'T SELL ME YOUR ROOFING! I AM USEING BERGER'S PATENT, IT IS THE BEST IN THE MARKET, AND YOU KNOW IT."

BERGER'S PATENT ROOFING

CRIMPED IRON

PLAIN ROUND

FIRE PROOF DOORS & SHUTTERS

METALLIC SHINGLES

CONDUCTOR

EXPANDING

PATENT CEILINGS

25 STYLES

CORNICES AND FINIALS

PERFECTION WATER CUT-OFF

PERFECTION WIRE HANGER

IMPERIAL STEEL HANGER

SKYLIGHTS ALL STYLES

132 PAGE Catalogue ON APPLICATION.

WRITE FOR PRICES IT WILL PAY YOU.

THE BERGER MFG. CO. CANTON, O.

IRON AWNINGS, ROOF PAINTS, WEATHER VANES, VENTILATORS, MALLEABLE IRON CRESTINGS, etc.

WESTERN AGENTS: ILLINOIS ROOFING & SUPPLY CO. CHICAGO, ILL.

CHAMPION of the WORLD.

(No reference to Mr. Corbett.)

In our "PENNSYL" OLD METHOD Terne Plate we have the Champion of all Champions *Roofing Plate*, a fact which is fully borne out by **Architects, Roofers and Builders.**

When we first introduced the "Pennsyl" it was with the intention that it should *always* be the Best and Leading Brand of Roofing Tin made, and it certainly is.

Just to think, every box contains *45 lbs.* of Pure coating. Other brands that are put in competition only have 30 to 36 lbs.

Every sheet guaranteed perfect in every way.

Every sheet stamped and squared.

We put it on the market in 1879 and we have been selling it continually since.

GUMMEY, SPERING & CO.,

Manufacturers and Importers Tin Plate, Metals, &c.

PHILADELPHIA, U. S. A.

Beware of a Brand on the market *simply called* "Old Method," it is a poor imitation, and intended only *to deceive.*

ÆTNA-STANDARD IRON & STEEL CO.

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. **BRIDGEPORT, OHIO.**

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD

Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,

535 to 547 West 15th Street, New York.

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

FOLLANSBEE BROTHERS COMPANY,

Successors to

James B. Scott & Co,

The officers of the new Company are the surviving partners of the old firm.

122 and 124 Second Ave., Pittsburgh, Pa.

Owners and Manufacturers of the Unrivaled

"Scott's Extra Coated" Guaranteed Roofing Tin Plate. Send for pamphlet giving description of it and fac-similes of testimonial letters of the highest order received from those best qualified to judge of its merits.

"Triumph Old Style" Roofing Tin Plate, of a little less coating than the "Scott's Extra Coated," but also made by the palm oil process.

ALSO SOLE FACTORS OF THE

BLAIRSVILLE ROLLING MILL AND TIN PLATE CO.,

Manufacturers of BLACK PLATE, CHARCOAL AND COKE BRIGHT PLATES AND ROOFING PLATES.

A BIG SPRING BUSINESS AT INTERESTING PRICES.

EXTRA QUALITY BRIGHT TIN

for WASH BOILERS, IX and IXX thickness.

SIZES 14 x 26 in., 14 x 28 in., 14 x 31 in., 14 x 56 in., 14 x 60 in.

We have a good stock of various sizes of Bright Tin in IC and IX thicknesses for making FURNACE PIPE. . . . . .

MERCHANT & CO., INC.,

. . . . . PHILADELPHIA, NEW YORK, BROOKLYN, CHICAGO, LONDON.

NEW CASTLE

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

New Castle Steel and Tin Plate Co., New Castle, Pa.

THE CAMBRIDGE IRON & STEEL CO.

MANUFACTURERS OF

GALVANIZED SHEET IRON

CAMBRIDGE C I&S CO BEST TRADE MARK

BLACK SHEETS FOR ROOFING & CORRUGATING

PICKLED & COLD ROLLED FOR STAMPING

CAPACITY RANGES FROM No 30 26 INCHES WIDE TO 1-4×40×120

CORRESPONDENCE SOLICITED

OFFICE & WORKS CAMBRIDGE, OHIO.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron

Also;

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

PALM OIL

BRANDS:

"Cecelia" Clarified Palm,
"Lagos" Palm,
"Choice Red" Palm,
"Brown" Palm.

☞ "Cecelia" Clarified Palm Oil is prepared by us especially for **Tin Plate Manufacturers**, and is clarified in order to remove moisture grit, and free acid to the minimum, thus making it the safest and surest oil to use.

LAMBERT, STOUGHTON & COOPER,

IMPORTERS AND PRESSERS OF OIL,

117 Walnut St., PHILADELPHIA, PA.

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS.** per box 28 x 20.

To Be Had of All Dealers.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

P. B. CALVERT & CO.,

IMPORTERS OF

TIN PLATES AND METALS,

Philadelphia, Pa.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. **Brooklyn, N. Y.**

JOSEPH C. KENT, President. **GEORGE DANBY, Sec'y and Treas.**

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. **SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.**

THE PHILLIPS TIN PLATE CO., Philadelphia, Pa.

"F. R. P. EXTRA." Treble coated. Oil Finish. Guaranteed to carry 45 lb. coating.
"PHILLIPS ROOFING." Extra heavy. Bright finish. " " 35 lb. "
"BOSTON." Heavy Spangled Terne. Guaranteed to carry 20 lb. coating.
"NATIONAL." (Worcester grade.) " " 10 lb. "

TIN PLATE

FIVE GRADES OF **BRIGHT.**

TWO GRADES OF **BOILER SIZES.**

FURNACE PIPE SIZES. COKES IN MANY ODD SIZES.

GOLDEN STAR REDIPPED TISSUE PACKED.

J. M. & L. A. OSBORN, - CLEVELAND, O.

ROOFING PLATES, All Grades.

BRIGHT PLATES Charcoal and Coke.

AMERICAN AND FOREIGN.

A Large Assortment of Qualities, Weights and Sizes.

SHEET IRON. B B GALVANIZED, CHARCOAL CLEANED, COLD ROLLED, COMMON.

GALVANIZED and TERNE EAVE TROUGH and GUTTER,

CORRUGATED LEADER, ELBOWS and SHOES.

SOLDER—A Specialty, our own make.

TIN, Pig and Bar,	INGOT COPPER,
LEAD, Pig and Bar,	ANTIMONY,
HARD METAL,	SHEET ZINC,
SHEET COPPER,	WIRE,
RIVETS,	IRON LATHING.

Also a large assortment of TINNERS' TOOLS and MACHINES and a full line of other goods for spring trade.

ORDERS AND INQUIRIES SOLICITED.

BRUCE & COOK,

186, 188, 190 Water St., 248, 250 Pearl St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. Harvey's Patent Cleaned Black Iron.

Painted Corrugated Roofing and Siding.

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96 102 Reade St., New York.

— "THIS is my first experience as a steeple chaser," murmured the Kansas farmer as he whirled through the air just behind the fragments of the village church.—*Yale Record.*

— GRIM HUMOR.—Teacher to Bainbridge street boy: "If you have a meal at 12 o'clock what do you call it?" "Luck," said the boy.—*Philadelphia Record.*

— MRS. BACON: "It is terrible down at your boarding house. You can never get any hot water."

Mr. Bacon: "Only we have soup, my dear."—*Yonkers Statesman.*

— HIS PREFERENCE.—Young Clerk: "Do you like to stand in front of the store and see the crowds go by?"

Old Merchant: "No, but I like to stand in the back of the store and see the crowds come buy."—*Buffalo Commercial.*

— PROFESSOR (returning home at night, hears noise): "Is some one there?"

Burglar (under the bed): "No!"

"That's strange; I was positive some one was under my bed."—*Tid-Bits.*



American Tin.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.

AMERICAN ROOFING CO.,

ST. LOUIS and CINCINNATI.

Mention this paper.

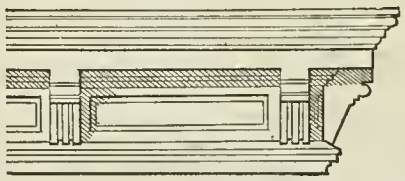


JAMES A. MILLER & BRO.,

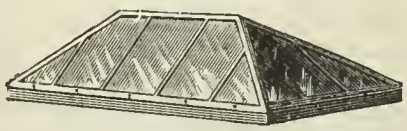
129 and 131 S. Clinton St., Chicago,

MANUFACTURERS

Galvanized Iron Cornices and Window Caps.



SHEET METAL SKYLIGHTS

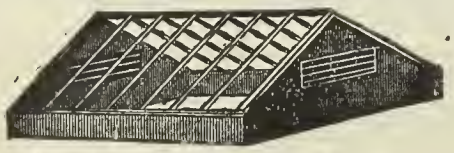


Owing to increased facilities (secured to enable us to fill our World's Fair contracts), we can make specially low prices on Skylights.

CORRUGATED { *Iron Roofing.* / *Conductor Pipes.*

See other Advertisement in this Paper.

RASNER & DINGER



Manufacturers of HAYES' PATENT

Metallic Sky-Lights,

Galvanized Iron Cornices and all kinds of Architectural Sheet Metal Work, Tin and Iron Roofers.

Second Ave. & Ferry St., Pittsburgh, Pa.

JOHN SANBORN,

Dealer in Metals,

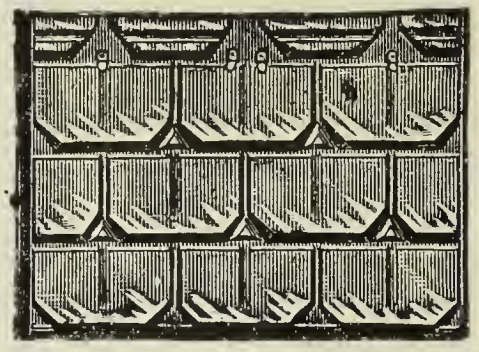
and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,

217 WATER STREET,

Near Beekman Street, NEW YORK.

THE FAVORITE METAL SHINGLE

EASTLAKE



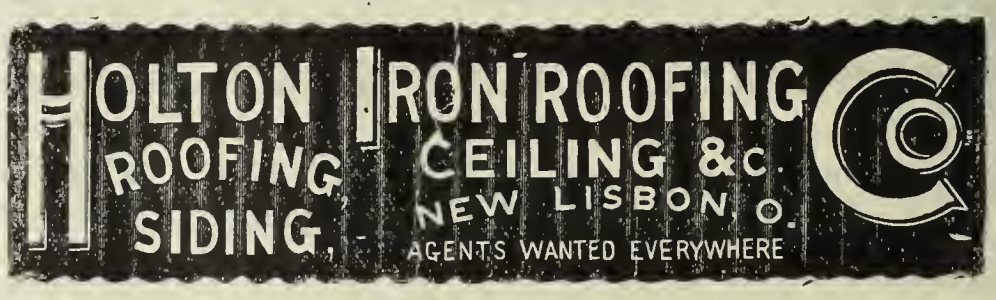
MONTROSS PATENT.

Gothic and Diamond Tile.

Unequaled for beauty and excellence.

SEND FOR CIRCULAR.

W. J. Burton & Co., - - - - Detroit, Mich.
Montross Metal Shingle Co., - - Camden, N. J.
E. Van Noorden & Co., - - - Boston, Mass.



GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,

—MANUFACTURERS OF—

SHEET METAL ROOFING, SIDING AND CEILING

—OF ALL DESCRIPTIONS FROM—

SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.

Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.
Factory 113 to 133 Soulard Street, ST. LOUIS, MO.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS

FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size. CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. LITTLEFORD BROS., SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati O.

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



HARRY IRON AND STEEL ROOFING CO.,

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

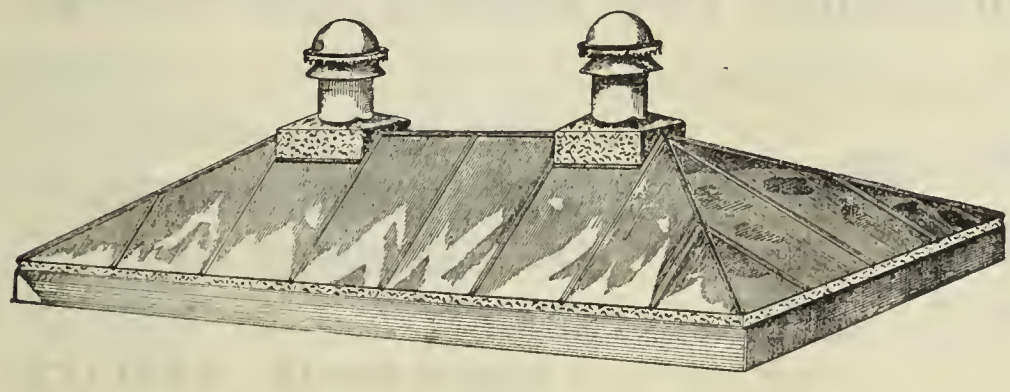
Designed for the better class of buildings, such as Residences, Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1894.

Mention THE METAL WORKER.





Galvanized Iron Skylights.

A COMPLETE LINE OF SIZES AND STYLES. SEND FOR PRICES.

SHEET METAL STATUARY A SPECIALTY.

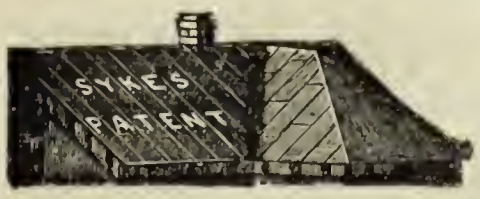
Spanish Tile Roofing in Copper and Steel. The most artistic and best roof on the market.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

J. T. Wagner, Sales Agt., 108 Chambers St., New York City.



WORLD'S FAIR AWARD

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

MANUFACTURERS

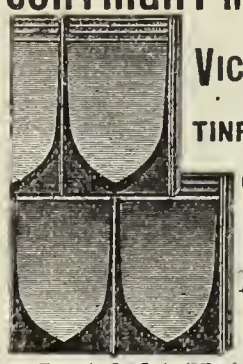


FOR

ROOFING AND SIDING.

Send for Circular and Prices.

CORTRIGHT METAL SLATES



and

VICTORIA SHINGLES

Made of

TINPLATE, (Full Weight Only)

Galvanized Steel

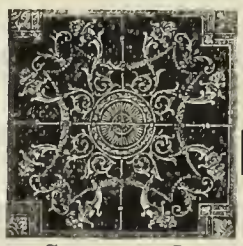
and

COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office. 134 Van Buren Street, Chicago.



STEEL CEILINGS, ROOFINGS, SIDINGS,

Corrugated Iron, Tin and Terne Plates, Eaves Troughs, Conductor Pipes, Rain Water Cutoffs, Galvanized and Black Sheets.

Ceiling catalogue No. 170. Roofing catalogue No. D 169.

WHEELING CORRUGATING CO.,

Office and Works, Wheeling, W. Va.
Office and Warehouse, No. 474 Laflin Street, Chicago.
Office and Warehouse, No. 81 Fulton Street, New York.
Office and Warehouse, cor. 12th & Poplar Sts., St. Louis.

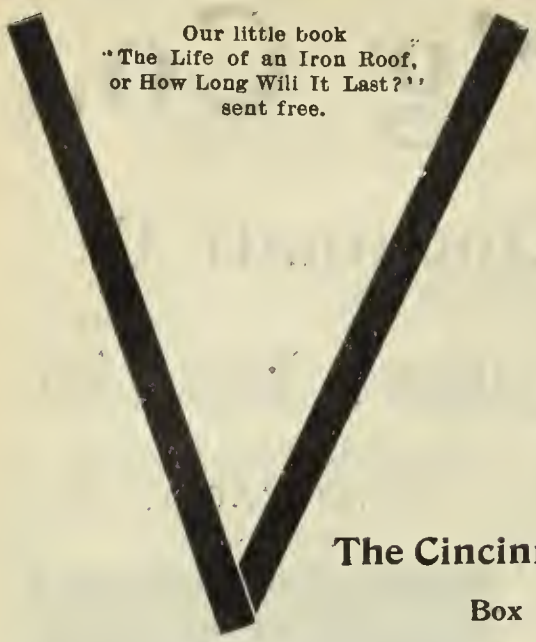
Special Discounts To The Trade.



IRON ROOF CRESTING.

Full line of new and desirable designs.

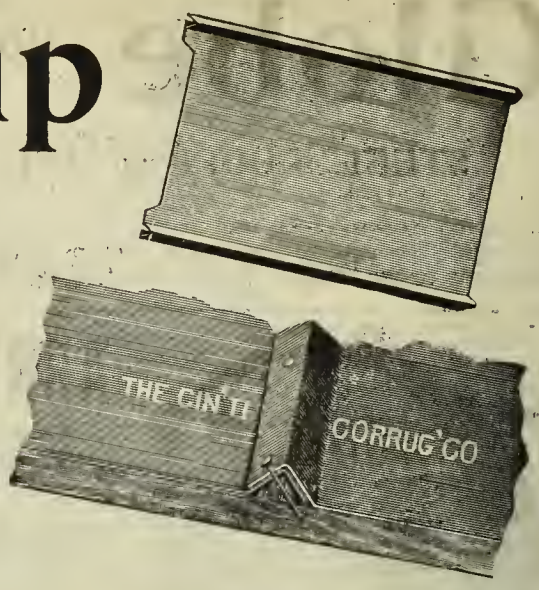
S. GREEN & SONS, Des Moines, Ia.



Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.

Crimp

The many years this style of Roofing has been before the public amply attests its merit.



It's the best "STAY ON" Roofing ever made.

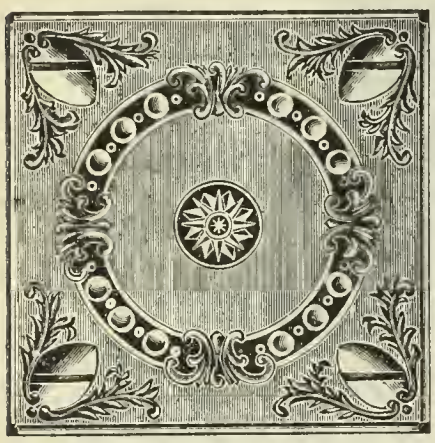
The Cincinnati Corrugating Co.,

Box 314, Piqua, Ohio.

The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S.

FIRST & WASHINGTON STS. JERSEY CITY, N.J.



Fine Metal Ceilings.

J. H. ELLER & CO.,

MANUFACTURERS OF

STEEL ROOFING,

Corrugated Iron Roofing and Siding,

Pressed Steel Brick and Rock Face Siding.

GALVANIZED CORNICE, WINDOW CAPS, CRESTINGS, FINIALS, ETC.

GALVANIZED STEEL EAVE TROUGH, CORRUGATED EXPANDING CONDUCTOR, EAVE TROUGH HANGERS, ETC.

Estimates Furnished for Special Designs on Short Notice

WRITE FOR CATALOGUE AND PRICES.

Office 194 E. Fifth Street, - - - - - **Canton, Ohio.**



BERGERS STAR BUCKET EARS

SEND FOR SAMPLE AND FULL ILLUST. CATALOGUE

L.D BERGER MANUF'R OF TINNERS HARDWARE AND SUPPLIES.

59 N. 2d STREET, - PHILADELPHIA, PA.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade

TIN AND IRON SHOW CARDS.

110 John St., - New York.

— DAY: "Years ago Loeser fell into a fortune."

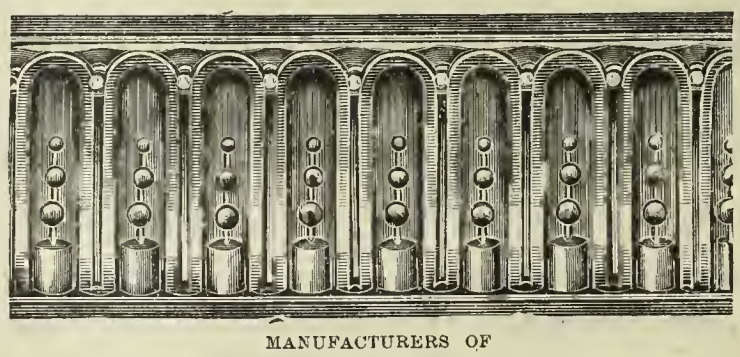
Weeks: "What course did he take?"

Day: "Went right through it."—*Puck.*

— GUEST (trying to cut a tough fowl): "This chicken would have been much better, landlady, if it had been served as an omelet."—*Fliegende Blaetter.*

Friedley & Voshardt,

194 and 196 Mather St., Chicago, Ill.,



MANUFACTURERS OF

Sheet Metal, Zinc and Copper Ornaments

For Interior and Exterior Work, Steel Ceilings, Statuary, &c.

Send for Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.

Architectural
Sheet Metal
Work.

Galvanized Conductor Pipe.
Galvanized Eaves Trough.
Copper Conductor Pipe.

The Canton Steel Roofing Co.,

Canton, Ohio.

Sheet Metal
Building Material,
All kinds.

No. 20, 22 and 24 Gauge
Galvanized Conductor Pipe.
Made only by ourselves.

WE GUARANTEE FULL SIZE AND WEIGHT.



SEND IN FOR YOURSELF
And if you don't find it as we say you may send it back at our expense.

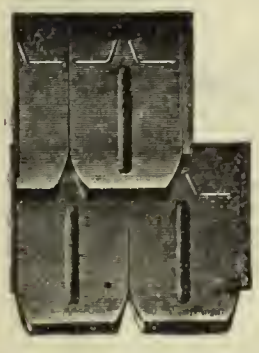
WHY
Use a Single Bead when you can buy a Double Bead for the same price?

DON'T BELIEVE IT WHEN THEY TELL YOU DIFFERENT.

Write for Prices and Discounts.

Rhodes, Dickelman & Co.,
FOREST, OHIO.

THORN'S PATENT METALLIC ROOFING



TILES AND SPRING-LOCK SHINGLES.

THE BEST, MOST HANDSOME, DURABLE AND SECURE ROOFING PLATES YET OFFERED TO THE BUILDING TRADE.

Indorsed by All the Leading Architects.

Our system differs from all others in existence. We keep a complete stock of *eight designs of tile and two sizes of shingles.* Our tiles are a marvel of beauty and have the most secure and most practical side-lock ever invented.

Send for illustrated catalogue and circular.

THORN SHINGLE & ORNAMENT CO.,
1221 Callowhill St., Philadelphia, Pa.

ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,
108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

At this time of the Year

metal workers are busy fixing furnaces, steam pipes, etc. Dixon's Graphite Pipe Joint Grease will make a better joint than red or white lead and parts can be separated easily even years after. When used on valves it does not harden or cause the valves to stick. Send for circular and sample.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

ELBOW CHART

—FOR—

TIN and SHEET IRON WORKERS,

Giving the Rise of the Miter Line of Elbows of any Diameter and Number of Pieces and for any Angle.

This is an easy and practical system of producing elbow patterns for the use of all light or heavy sheet metal workers. It is simple, accurate and most valuable, being the only *thumb* rule ever produced from which accurate results may be expected. Every good workman has some rule by which he may develop a satisfactory pattern for Elbows at right angles, but when something different is wanted, it is a little trouble. By the use of this chart he can safely depend on getting a correct pattern for any elbow, no matter of what diameter, number of pieces or angle, and mark it out direct on his strip of iron or tin, almost as quick as if he had a pattern. This chart has more combinations and measurements than may be counted, and will be a great help to young or old at the business.

PRICE, 50c. BY MAIL.

DAVID WILLIAMS,
PUBLISHER and BOOKSELLER,
96-102 Reade Street, - New York.

THE ROOT & BARRON
ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty-five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer.
PALMYRA, NEW YORK.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York:

Manufacture every size and kind of Black, Tinned Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds

A Tale of Two Spiders.

I saw not long ago an example of genuine reasoning and bitter resentment exhibited by a spider. In one corner of my yard, protected by an overhanging cornice and porch, there are several spider webs, and in particular two, one directly above the other at a distance of six inches, and each tenanted by a large spider.

I was seated in a chair in the shade on a Sunday afternoon when I noticed them, and I picked up a small chip and tossed it into the upper web to see what the spider would do. He ran out and examined the chip. An inspection of it convinced him thst it was of no earthly use to a spider, and he set about getting rid of it. He was very methodical, and went regularly around the chip, cutting the threads on each side until the chip finally hung by one strand, which he severed, and it dropped into the web of the spider who was keeping house on the lower story.

Out came the latter, thinking he had caught something, but when he found it was a chip his rage seemed unbounded. It was evidently not the first time that his upper story neighbor had dumped his refuse into the lower web, and he was determined to stand it no longer.

He went up the ropes like an athlete, leaving the chip where it fell, and in an instant was in the upper web, where he proceeded at once to attack the offender. They had a terrible fight, and rolled over and over each other, biting and hugging with ferocity. At last in their tumbles they fell through the hole where the chip had been cut out and down into the lower web, which seemed to frighten the upper spider, who was nevertheless a little the larger. After a few more tumbles he got loose and escaped up a rope to his own quarters, minus the whole of one leg and half of another. The lower spider climbed half way up in pursuit, and then stopped, it seemed, to reflect. He waited a moment, and then he, too, seemed to conclude that he had had enough, so he went back and cleared out the chip and mended his web.

I then dropped two or three straws into the upper web, but the spider paid no attention. The other had given him a lesson—had in spider language set up a sign, reading: "No dumping in this web under penalty of the law," and he was not slow to take a hint.—*Exchange.*

THE PHILADELPHIA STEEL ROOFING CO.
MANUFACTURERS OF
STEEL ROOFING AND CORRUGATED IRON,
514, 516 & 518, BEACH ST.
PHILADELPHIA PA.
SEND FOR CATALOGUE AND PRICES.

E. J. JOHNSON & Co.,
MINERS AND SHIPPERS OF
ROOFING : SLATE.
OFFICE, 38 PARK ROW,
SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, MARBLE, TOOLS, FELT, CEMENT, ETC.
QUARRIES, BANGOR, PA.
NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.
JOHN GALT & SONS.
MINERS AND WHOLESALE DEALERS IN
All KINDS of ROOFING SLATE.
253 BROADWAY, ROOMS 805 and 806, NEW YORK.
Prices given delivered at any R. R. Station in the United States.

SLATE
Kitchen Sinks,
Laundry Tubs,
Washstand Tops,
Marbleized Shelves,
Materials of all kinds,
Fairhaven Marble & Marbleized Slate Co.,
In all Forms, also Mantels.
FAIRHAVEN, VERMONT.
SEND FOR CATALOGUE.

BANGOR EXCELSIOR SLATE COMPANY,
R. S. BROWN, Proprietor.
Miners and Manufacturers of
GENUINE BANGOR SLATE
Quarries at Bangor, Pa.
MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, • • EASTON, PA.

RISING & NELSON,
WEST PAWLET, VT.
MANUFACTURERS OF
RED and GREEN ROOFING SLATE.
Wholesale Dealers in all kinds of Roofing Slate.
CORRESPONDENCE SOLICITED.



All set up ready to use. Price, $30.00. Freight allowed to points as far West as Missouri River, and as far South as Galveston, Tex.

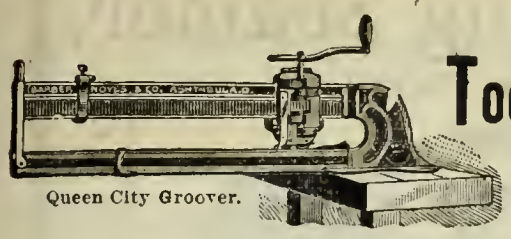
FOR SALE BY
Hall & Carpenter, Philadelphia, Pa.
Austin & Doten, Boston, Mass.,
Hackett Hdw. Co, St. Paul, Minn.
and jobbers generally.

If your jobber can't supply you, order direct of the manufacturers.

Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

SEND FOR CATALOGUE.

JACOB BROMBACHER'S SONS, • No. 30 Cliff St., N. Y. City.
Established 1833. Incorporated 1887.


Queen City Groover.

NIAGARA

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

A FULL LINE.

The Best and Most Improved

ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

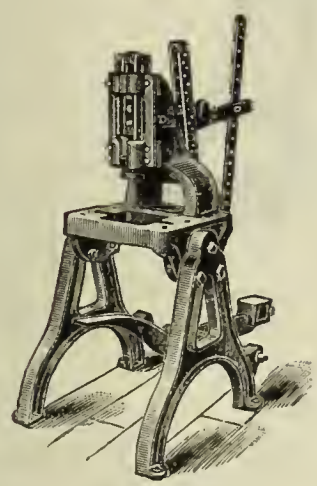
CORNICE MAKERS' TOOLS.

PRESSES AND DIES.

Squaring, Slitting and Circle Shears.

Complete Outfits for making Tinware, Cans and other Sheet Metal Goods.

—MANUFACTURED BY—


Adjustable Foot Press.

The Niagara Stamping & Tool Co.,

CORRESPONDENCE SOLICITED.

BUFFALO, N. Y.

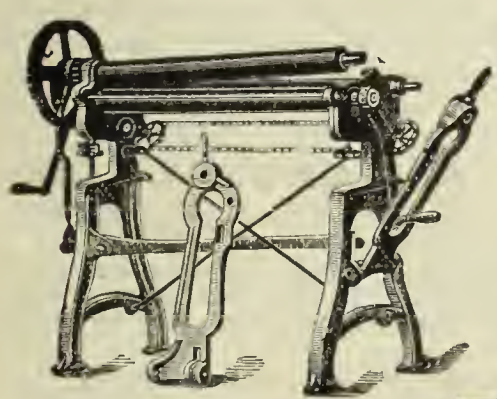
Metal Workers' Machinery.

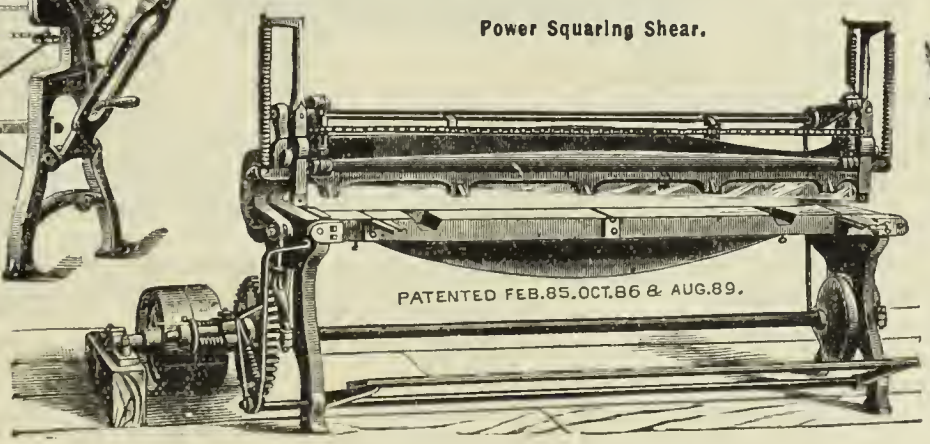
For several years past our efforts have been directed solely towards the production of a line of sheet metal working machinery that would at once prove economical, durable and peculiarly adapted for the purpose intended. In this we have been successful beyond our most sanguine expectations and therefore desire to announce to all workers of sheet metal that it would be to their interest to correspond with us. We have a good stock of various machines on hand and in course of completion. Address

BERTSCH & COMPANY,

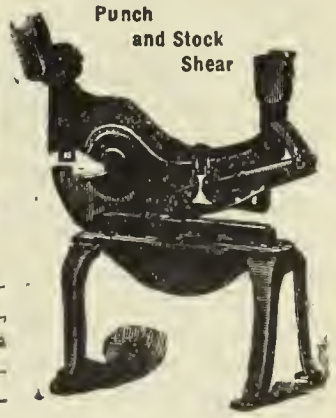
MANUFACTURERS OF SHEET METAL WORKING MACHINERY,

CAMBRIDGE CITY, IND.


Slip Roll Former.



Power Squaring Shear.


Punch and Stock Shear



Kenney's Patent Double Seamer

FOR STANDING LOCK

TIN ROOFING.

Improved machine, from new patterns, now ready. Send for prices and flattering testimonials from users.

MANUFACTURED BY

Dwight Slate Machine Co.,

Hartford, Conn.

— "WHAT do you suppose ever made them call a prison Sing Sing?" "I reckon it was on account of the bars."—*Atlanta Journal.*

— "GOOD BY, Old Slow!" shouted the bicycle. "You are not in my class." "Anyway," retorted the cart horse, "I am not as awkward as you are. I don't fall down standing still."—*Cincinnati Tribune.*

— "SAY, mother, will you speak to that Sammy?"

"What's he doin' now?"

"Well, every time I hit him on de he'd wid dis hammer he hollers."—*Life.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Matcrials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

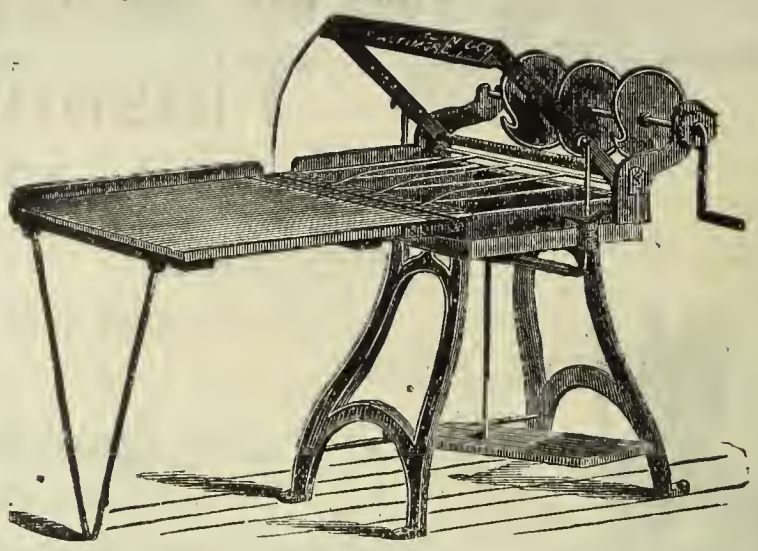
Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

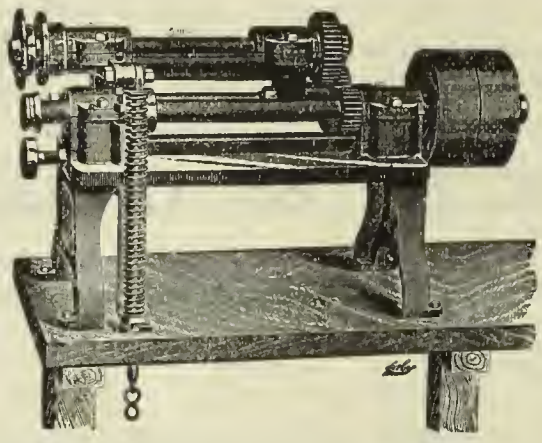
First, for Rapidity of Work.
Second, for Quality of Work.
Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

LYON, CONKLIN & CO.,

Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.



—OUR—

POWER TRIMMING MACHINE

is designed to trim the edges of **Sheet Metal Boxes, Rim Covers, Blacking Boxes, Lard Pail Covers, Ladle Bowls, Dipper Bowls and Similar Work. Will Trim Covers up to 1½ inches in depth and 15 in. diameter.**

—MANUFACTURED BY—

G. A. CROSBY & CO.,

176 & 178 S. Clinton St., Chicago, Ill., U.S.A.,

DESIGNERS AND BUILDERS OF

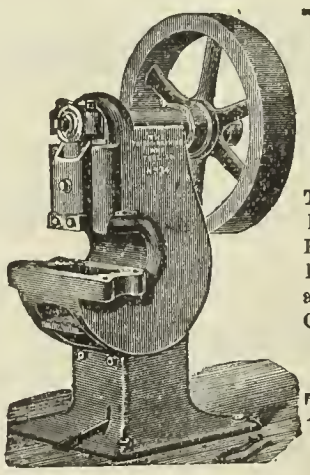
Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can and Soap Makers, and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Brass Goods and all Hardware Novelties.**

Special Attention to Dies of Every Description.

WORK GUARANTEED THE BEST.

Write for Prices and New Catalogue Containing Full Line of Tinners' Tools.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.



The Toledo Machine & Tool Co.,

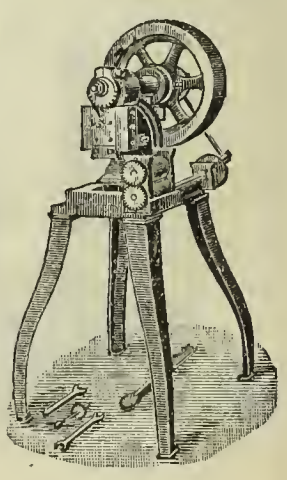
MANUFACTURERS OF

Power Punching Presses, Drop Presses Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

Send for Catalogue now being Printed.

The Toledo Machine & Tool Co.

Superior and Oak Sts., Toledo, O.



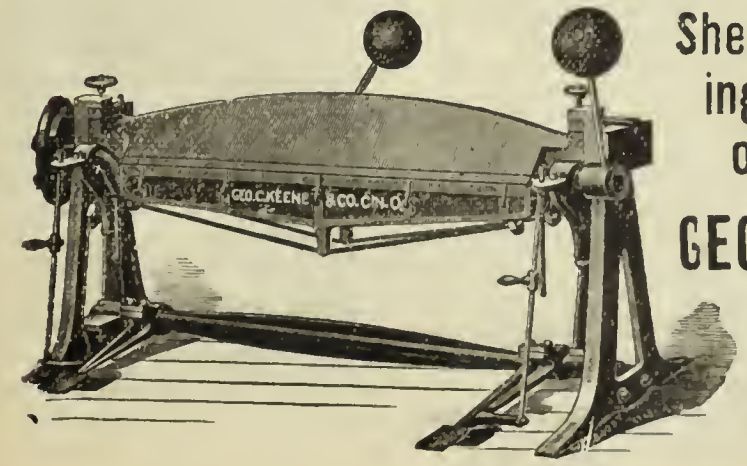
ALPHABETICAL LIST OF ADVERTISERS.

Acme Roofing & Supply Co.. 88
Ætna Standard Iron & Steel Co..... 83
American Boiler Co..... 26
American Radiator Co..... 1
American Roofing Co..... 88
American Sheet Iron Co..... 86
Apollo Iron & Steel Co:..... 1
Armstrong Mfg. Co..... 77
Auld & Conger..... 81
Bailey-Farrell Mfg. Co..... 78
Bangor Excelsior Slate Co.. 92
Barstow Stove Co.....100
Bascom, H. Clay.. 74
Belden, F. E. Mica Mining Co..... 29
Bellaire Stamping Co..... 69
Berger Bros..... 80
Berger, L. D.....68&90
Berger Mfg. Co..... 82
Bertsch & Co..... 93
Bibb, B. C. Stove Co..... 22
Bliss, E. W. Co..... 98
Blodgett, G. S. Co..... 29
Bowen Mfg. Co..... 29
Bower, B. P. & Co..... 80
Bowers Roofing & Metal Wks 81
Brauer, A. G..... 74
Bridgeport Crucible Co..... 75
Brombacher's Sons, Jacob.. 92
Bruce & Cook.....87&100
Buffalo Register Works..... 29
Burgess Soldering Furnace Co..... 79
Burton, W. J. & Co..... 88
Calvert, P. B. & Co..... 86
Cambridge Iron & Steel Co.. 85
Canfield, H. O..... 79
Canton Steel Roofing Co..... 91
Carton Furnace Co..... 3
Central Stamping Co..... 71
Challenge Corn Planter Co.. 28
Chamberlain, J. W. Co..... 79
Cheney, S. & Son..... 67
Chicago & Erie Stove Co..18&20
Cincinnati Corrugating Co.. 90
Clark, G. M. & Co..... 74
Clark Novelty Co..... 68
Clark, Quien & Morse ... 80
Clayton & Lambert Mfg. Co. 76
Cleveland Gas Machine Co.. 68
Clifton Springs Mfg. Co..... 70
Columbia Refrigerator Co.. 25
Colwell Lead Co..... 77
Connecticut Plating Co..... 75
Cooney, Seiner & Co..... 80
Cope, Geo. W..... 74
Corning Mfg. Co..... 22
Correspondence School of Mechanics..... 66
Cortright Metal Roofing Co. 89
Cory, U. & Co... 29
Covert Mfg. Co..... 68
Craig-Reynolds Fdy. Co..... 20
Crosby, G. A. & Co..... 94
Curtis & Curtis..... 77
Dalton-Ingersoll Co..... 76
Dangler Stove & Mfg. Co.... 9
Dixon, Jos., Crucible Co..... 91
Douglas, W. & B..... 78
Dover Machine Works..... 95
Dwight Slate Machine Co.... 93
Electric Boiler Co..... 22
Eller, J. H. & Co..... 90
Engelhart, Geo. H..... 68
Exeter Machine Works..... 1
Excelsior Mfg. Co..... 5
Fairhaven Marble & Marbleized Slate Co..... 92
Ferrosteel Co..... 30
Follansbee Bros. Co..... 84
Foskett & Bishop Co.. 66
Fostoria Steel Roofing Co... 89
Frink, I. P..... 100
Friedley & Voshardt..... 90
Froelich, A., Estate of..... 75
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 92
Garry Iron & Steel Roofing Co..... 89
Gender & Paeschke Mfg. Co. 73
Giblin & Co..... 23
Glenmore Foundry & Machine Co..... 25
Globe Iron Roofing & Corrugating Co..... 89
Globe Ventilator Co..... 74
Gobeille Pattern Co..... 74
Gobeille, Wm..... 74
Gordon, W. J..... 98
Gorton & Lidgerwood Co..... 1
Graff & Co..... 20
Greene, W. F 67
Green, S. & Sons..... 89
Grinberg Bros..... 10
Griswold Mfg. Co 71
Gummey, Spering & Co..... 83
Gurney Heater Mfg. Co..... 23
Gurney Refrigerator Co..... 29
Halliday, M 89
Hamilton, John.....100
Hart & Crouse 25
Hartford Hollow Ware Co . 68
Haslet, Flanagen & Co..... 69
Henrie Mfg. Co..... 78
Hess, Snyder & Co..... 27
Highland Foundry Co..... 1
Highton, Wm. & Sons..... 31
Holton Iron Roofing Co..... 88
Howard Furnace Co..... 32
Howard Thermostat Co..... 27
Howson & Howson 67
Illinois Refrigerator Co..... 28
Illinois Zinc Co. 85
Indiana Ladder Co..... 70
Iwan Bros..... 72
Jackson's Sons, W..... 27
Jenkins Bros..... 1
Jersey City Galvanizing Co. 79
Johnson, E. J. & Co 92
Jones, L. B.. 19
Kanneberg Roofing Co..... 81
Kansas City Metal Roofing & Corrugating Co..... 91
Keene, Geo. C. & Co..... 95
Kelly, Thos. & Bro..... 76
Kemp, C M Mfg. Co..... 81
Kendrick Valve & Washer Co..... 67
Kernan Furnace Co..... 21
Keuffel & Esser Co..... 67
Kewanee Boiler Co..... 24
Kieckhefer Bros. & Co..... 71
Kieley, T..... 1
Kilbourne & Jacobs Mfg. Co. 76
Lambert, Stoughton & Cooper 85
Lawrence-Letts Elbow Co... 78
Lindemann, A. J. & Hoverson Co..... 10
Littleford Bros..... ... 88
Lufkin Rule Co..... 98
Lyon, Conklin & Co.... 94
McClnre & Co..... 100
McDaniel & Harvey Co..... 87
McLain, J. H. Co..... 30
McLanghlin, J. K. 74
McLeod & Henry Co..... 75
Mahony, M.. 24
Marcy Stove Repair Co..... 75
Marlin & Co..... 80
Marston, I. G. & Co..... 80
Mason & Davis Co..... 18
Mason Regulator Co..... 1
Merchant & Co., Inc.... 85
Merry, Geo. E..... 89
Meurer Bros. Co..... 86
Mica Mfg. Co..... 30
Millar, Chas. & Son... ...100
Miller, Jas. A. & Bro.... 80,88&89
Miller, Wm. Range & Furnace Co..... 16
Miner & Peck Mfg. Co... .. 98
Montross Metal Shingle Co.. 88
Mowry, W. C..... 27
Mullins, W. H..... 89
Munsell, E. & Co... 30
Myers, F. E. & Bro..... 78
National Wringer Co..... 73
Newark Regulator Co..... 77
New Castle Steel & Tin Plate Co..... 85
New York Central Iron Wks. 22
New York Elbow Co..... 69
New York Iron Roofing & Corrugating Co..... 90
New York Nickel Plating & Mfg. Co..... 72
Niagara Stamping & Tool Co. 93
Niles Mfg. Co..... 73
Noble, Chas. & Co..... 14
Obdyke, W. A. & Co..... 80
Obermayer, S. Co..... 75
Ohl, Geo. A. & Co 98
Osborn, J. M. & L. A..... 86
Ostrander, W. R. & Co..... 88
Palermo Mica Co.... 30
Pancoast, Henry B. & Co.... 79
Paxson, J. W. & Co..... 75
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 77
Peninsular Stove Co.....17
Perry Stove Co..... 11
Phelps, Dodge & Co 84
Philadelphia Steel Roofing Co..... 92
Phillips Tin Plate Works.... 86
Pocock, O..... 99
Pontyminster Old Style Ternes..... 85
Poorman Mfg. Co..... 99
Portsmouth Stove & Range Co..... 19
Presbrey Stove Lining Co... 74
Putnam Fonndry & Machine Co 25
Rasner & Dinger 88
Republic Iron Works, ... 85
Rhodes, Dickelman & Co.... 91
Ringen Stove Co..... 2
Rising & Nelson..... 92
Robinson, J. M. & Co ... 99
Rochester Stamping Wks.... 70
Rome Mfg. Co..... 72
Root, A. L..... 92
Rntland Fire Clay Co.... 74
St. Louis Corrugating Co.... 88
St. Louis Stamping Co..... 72
S S. S. Condnctor Co..... 81
Sa'em Nail Co 92
Sanborn, John 88
Saunders' D. Sons..... 78
Sayre Stamping Co..... 67
Schaffer, J. P..... 24
Schneider & Trenkamp Co.. 8
Severding, John..... 79
Shepard, Sidney & Co..... 69
Sheppard, Isaac A. & Co. 1,12&13
Shirk Refrigerator Co..... 28
Silver & Co 72
Sims Mfg. Co. 79
Smith & Winchester Co..... 25
Smith Co., H. B..... 24
Smith, J. D. Foundry Supply Co 74
Souther, E. E. Iron Co..... 85
Special Notices..... 66
Sperry, D. R. & Co..... 72
Standard Lighting Co..... 6
Star Coupler Co..... 26
Star Mfg. Co..... 70
Stebbins, E. Mfg. Co..... 77
Steel Clad Bath Co..... 77
Stellwagen & Kynoch..... 67
Stiles & Parker Press Co.... 98
Stocking, E. B 67
Superior Steel Range Co.... 27
Sykes Iron & Steel Roofing Co 89
Syracuse Stove Works..... 15
Taplin, Rice & Co..... 18
Tarbox Mfg. Co..... 75
Taylor Co., N. & G 100
Thatcher Furnace Co..... 26
Thorn Shingle & Ornament Co..... 91
Tinners' Machinery & Supply Co..... 99
Tinplate Decorating Co..... 10
Toledo Machine & Tool Co.. 94
Troy Nickel Works..... 30
Troy Oil Stove Co..... 10
Tuttle & Bailey Mfg. Co 31
Union Heater & Supply Co.. 78
United States Heater Co.... 24
Valentine, M. D. & Bro. Co... 74
Van Namee, G. L. Mfg. Co.... 67
Van Noorden, E. & Co. 88
Van Range Co., John..... 4
Vedder Pattern Works..... 74
Vogel, William & Bros..... 73
Washburne, E. G. & Co..... 74
Wayne, Jos. W..... 29
Weathered's, Thos. W. Sons 23
West, Jas. R..... 70
Wheeling Corrugating Co... 89
Whitlock, W..... 79
Wilson, R. M..... 77
Wise, John & Son..... 69
Wister, L. & R. & Co 100
Wohler Aluminum Co 69
Wood, Alan Co..... 87
Wood Co., W. Dewees..... 100
Yates & Co..... 66
Zero Valve Co..... 79

THE KEENE FOOT POWER

CORNICE : BRAKE.

EASIEST TO OPERATE, STRONGEST AND BEST.



Sheet Metal Working Machinery of all Kinds.

GEO. C. KEENE & CO.,

Cincinnati, Ohio.

PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS, Dover, Del.

THE ENGLISH AND AMERICAN MECHANIC:

An Every-day Hand-Book for the Workshop and the Factory.

CONTAINING

SEVERAL THOUSAND RECEIPTS, RULES AND TABLES INDISPENSABLE TO THE MECHANIC, THE ARTISAN AND THE MANUFACTURER.

By VAN CLEVE and EDWARDS.

500 Pages, Cloth, $2.00.

Sent, postpaid, upon receipt of price, by

DAVID WILLIAMS, 96-102 Reade St. N.Y.

CLASSIFIED LIST OF ADVERTISERS.

Aluminum.
Shepard, Sidney & Co., Buffalo, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Basin Plugs.
Canfield, H. O., Bridgeport, Conn.

Bathtubs.
Dalton-Ingersoll Co., Boston, Mass.
Peck Bros. & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.
Wilson, R. M., Rome, N. Y.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
Eller, J. H. & Co., Canton, O.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Chucks.
National Chucks, 39 Cortlandt St., N. Y.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Cincinnati Corrugating Co., Piqua, Ohio.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A. & Bro., Chicago, Ill.
Ohdyke, W. A. & Co., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford, Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Bromhacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cream Can Fittings.
Geuder & Paeschke Mfg. Co. Milwaukee, Wis.

Cresting.
Green, S. & Son, Des Moines, Iowa.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Oils, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct.

Dust Pans.
West, Jas. R., Gas City, Ind.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Rhodes, Dickelman & Co., Forest, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Rhodes, Dickelman & Co., Forest, O.
Severding, Jno., Richmond, Ind.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
McLeod & Henry Co., Troy, N. Y.
Preshrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Foundry Facings Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibh, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Craig-Reynolds Foundry Co., Dayton Ohio.
Foskett & Bishop Co., 114 Liberty St., N. Y.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Thatcher Furnace Co., 240 Water St., N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Henrie Mfg. Co., Xenia, Ohio.
Union Heater Supply Co., Detroit, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Cleveland Gas Machine Co., Cleveland Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Handles and Knobs.
Haslet, Flanagau & Co., Phila., Pa.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y.
Poorman Mfg. Co., Canton, Ohio.

Heaters, Steam and Hot Water.
American Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Foskett & Bishop Co., 114 Liberty St., N. Y.
Fuller & Warren Co., Troy, N. Y.
Glenmore Foundry & Mch. Co., Phila., Pa.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
McLain, J. H. Co., Canton, Ohio.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Smith Co., H. B., 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass.
Thatcher Furnace Co., 240 Water St, N. Y.
United States Heater Co., Detroit, Mich.
Weathered's, Thos. W. Sons, 139-143 Centre Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Shepard, Sidney & Co., Buffalo, N. Y.
Silver & Co., Brooklyn, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipshurg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Piqua, Ohio.
Gummey, Sperling & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Ladders.
Indiana Ladder Co., Indiana, Pa.

Lamp Stoves and Heaters.
Perry Stove Co., Albany, N. Y.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.

Metallic Lathing.
Jersey City Galvanizing Co., 112 John St., N. Y.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Beideu, F. E. Mica Mining Co., Bostou, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Obermayer, S. & Co., Cincinnati, Ohio.
Smith, J. D. Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.

Oil Cans.
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters (*See Stoves and Ranges, Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Palm Oil.
Lambert, Stoughton & Cooper, Phila., Pa.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocklug, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobelile Pattern Co., Cleveland, Ohio.
McLaughlin, John K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St. N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Plating Co., Phila., Pa.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers' Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Bower, B. P. & Co., Cleveland, O.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Star Coupler Co., St. Louis, Mo.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Union Heater Supply Co., Detroit, Mich.
Wilson, R. M. Rome, N. Y.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Douglas, W. & B., Middletown, Conn.
Hess, Snyder & Co., Massillon, O.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Crosby, G. A. & Co., Chicago, Ill.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water.
American Radiator Co., Chicago, Ill.
Exeter Machine Works, Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., N. Y.

Refrigerators.
Bower Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co., Grand Haven, Mich.
Columbia Refrigerator Co., Northville, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.
Illinois Refrigerator Co., Chicago, Ill.
Shirk Refrigerator Co., Chicago, Ill.
Wayne, Jas. W., Cincinnati, Ohio.

Registers.
Buffalo Register Works, Buffalo, N. Y.
Ferrosteel, Cleveland, O.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman Street, New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N.Y.
Silver & Co., Brooklyn, N. Y.
Wise, J. & Son., Butler, O.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Dixon, Jos. Crucible Co., Jersey City N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel, Corrugated and Plain.
Acme Roofing & Supply Co., Canton, O.
American Roofing Co., Cincinnati, O.
Berger Mfg. Co., Canton, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, O.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing & Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugating Co., St. Louis Mo.
Souther, E. E. Iron Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGE 95.

Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Dwight Slate Machine Co., Hartford Conn.
Lyon, Conklin & Co., Baltimore, Md.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.
Rising & Nelson, West Pawlet, Vt.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co., Toledo, O.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.
Rasner & Dluger, Pittsburgh, Pa.

Slaters' Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Henrie Mfg. Co., Xenia, Ohio.
Union Heater Supply Co., Detroit, Mich.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Steam & Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Pattern.
Bascom, H. Clay, Troy, N. Y.
Cope, G. W., Detroit, Mich.
Gobeille, Wm., Cleveland, Ohio.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Frocilch, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Steilwagen & Kynoch, St. Ignace, Mich.
Van Namee, G. L. Mfg. Co., Gouverneur, N. Y.

Stoves and Ranges.
Bibb, B. C. Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
Excelsior Mfg. Co., St. Louis, Mo.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co., Boston, Mass.
Mason & Davis Co., Chicago, Ill.
Miller, Wm. Range & Fce. Co., Cincinnati, Ohio.
Noble, Chas. & Co., Philadelphia, Pa.
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Superior Steel Range Co, Cleveland, Ohio.
Syracuse Stove Works, Syracuse, N. Y.
Taplin, Rice & Co., Akron O.
Thatcher Furnace Co., 240 Water St., N. Y.
Van, John, Range Co., Cincinnati, O.

Stoves and Ranges, Gas.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Grinberg Bros., 154 South St., N. Y.
Jones, L. B., St., Louis, Mo.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Perry Stove Co., Albany, N. Y.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, O
Grinberg Bros., 154 South St., N. Y.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Perry Stove Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Troy Oil Stove Co., Troy, N. Y.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Pattern Rules.
Lufkin Rule Co., Saginaw, Mich.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Bruce & Cook, 186 to 190 Water St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila. Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Kleckhefer Bros. & Co., Milwaukee, Wis.

Tinware, Anti-Rustless.
Clifton Springs Mfg. Co., Clifton Springs, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Acme Roofing & Supply Co., Canton, O.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N.Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, Geo. A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.

Torches, Plumbers' and Tinners.
Kendrick Valve & Washer Co, Syracuse, N. Y.

Traps and Vents.
Bower, B. P. & Co., Cleveland, O.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Watering Pots.
Engelhart, Geo. H., Glenville, Ohio.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 95.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA, AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - - -	$1.00	SIX MONTHS, - - - - - - -	$22.10
ONE MONTH (5 Times), - - - - -	5.00	ONE YEAR, - - - - - - - -	40.30
THREE MONTHS, - - - - - - -	12.35		

Rates for larger spaces quoted on application.

DAVID WILLIAMS, Publisher.

96, 98, 100 and 102 Reade Street, NEW YORK. — **59 Dearborn Street, CHICAGO.**

New York (Main Office), - -	96-102 Reade Street, - - - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509 Hamilton Building, - - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - - - - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - - -	HENRY SMITH, Manager.
St. Louis, - - - - - -	Bank of Commerce Building, - - - - - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - -	312 The Cuyahoga, - - - - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

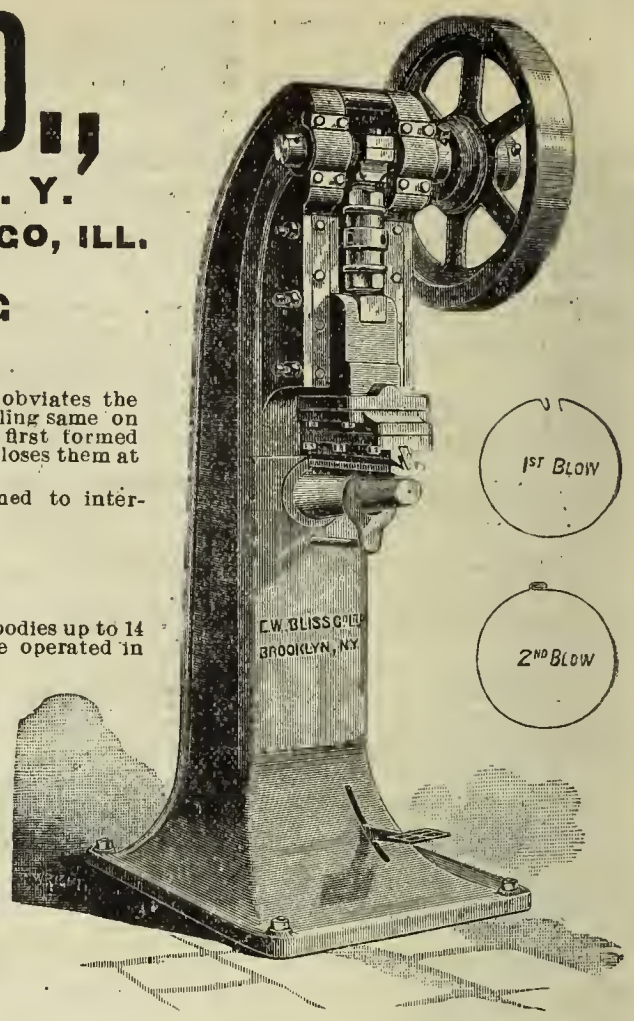
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.

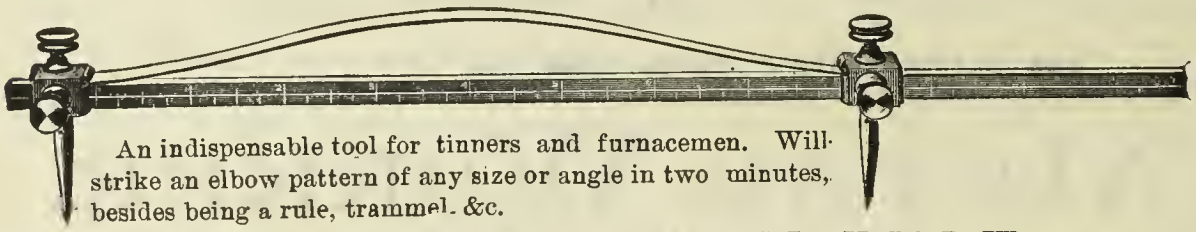


PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

DIES, SPECIAL MACHINERY &c.

THE STILES & PARKER PRESS CO.



An indispensable tool for tinners and furnacemen. Will strike an elbow pattern of any size or angle in two minutes, besides being a rule, trammel, &c.

"MAGIC" PATTERN RULE.

Price Reduced to $3.50 Net Cash.

Complete with Chart. Will pay for itself in a short time.

Send for Descriptive Circular.

LUFKIN RULE CO.

SAGINAW, MICH.

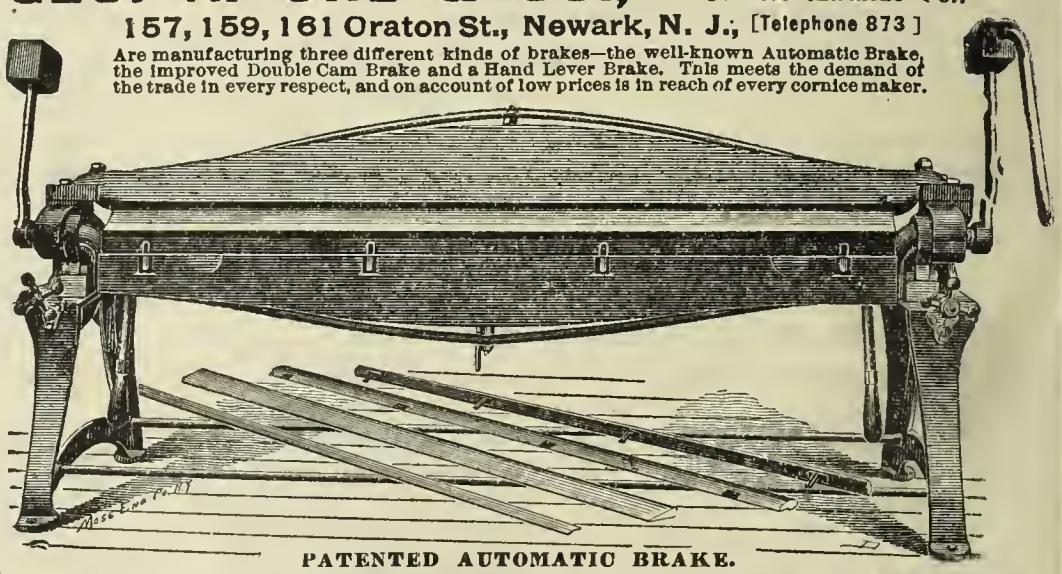
IF YOU WANT ANYTHING IN THE LINE OF
DROP PRESSES · DROP HAMMERS · STAMPS OR AUTOMATIC DROP LIFTERS.
SEND FOR CATALOGUE TO
Miner & Peck Mfg. Co.
NEW HAVEN, CONN.
LARGEST LINE IN THE MARKET

GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co.,

157, 159, 161 Oraton St., Newark, N. J., [Telephone 873]

Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892 Send for our illustrated catalogue.

PATENT AUTOMATIC CAN BODY SEAMERS.

COMBINATION Presses and Dies,

SHEET METAL TOOLS, &c.

218 New St.,

W. J. GORDON, PHILADELPHIA, PA.

— MAGISTRATE (to witness): "Why didn't you go to the help of the defendant in the fight?"

Witness: "I didn't know which one of them was going to be the defendant."—*Philadelphia Inquirer.*

— THE JUDGE: "I hope I shall not see you here again."

Prisoner (who is arrested weekly): "Not see me? Why, yer ain't goin' to resign yer position, are yer?"—*Truth.*

— BROWN: "Is young Flyingwedge practicing law?"

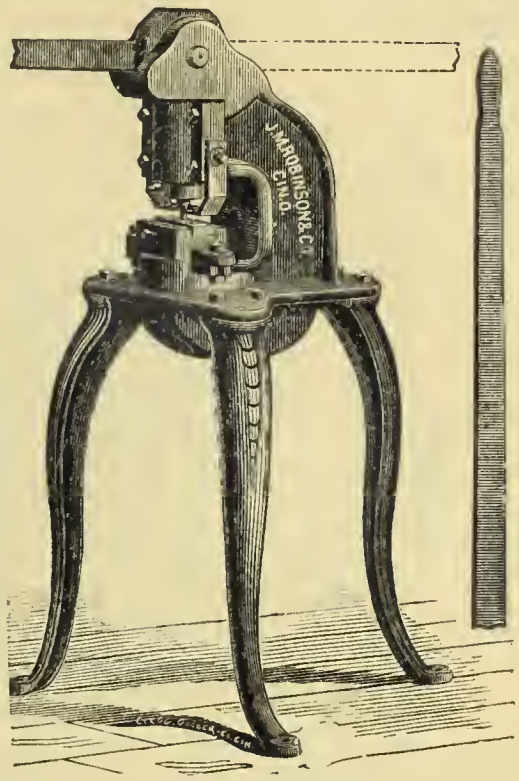
Jones: "I think not. He was admitted to the bar, but I think he's practicing economy."—*Vogue.*

— BOBBY: "Why doesn't the clock strike 13, Pa?"

Papa: "Because, Bobby, it hasn't the face to do it."—*Judge.*

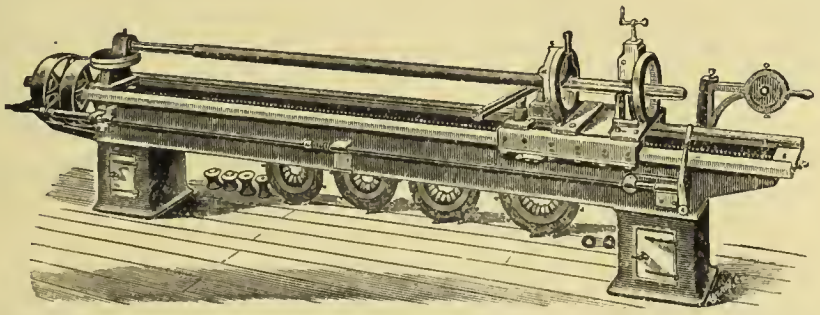
PRESSURE EITHER FRONT OR REAR

is certainly more convenient when using a press than when the pressure is but one way. The former arrangement applies to the double acting press shown at the right. In an experience extending over a period of 36 years we have always found it profitable to make all our machines **CONVENIENT TO USE.** We make, in addition to this, a number of sheet metal working tools such as Bench Shears, Comb. Punch and Shears, Hand Lever Punching Presses, Power Punching Presses, Corner Iron Benders, Geared Power Punches, Hand Lever Shears, Bench Shears, Screw Presses, in fact Punches and Presses of all kinds, and the only "Globe Cornice Brake."



J. M. ROBINSON & CO.,
CINCINNATI, OHIO.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

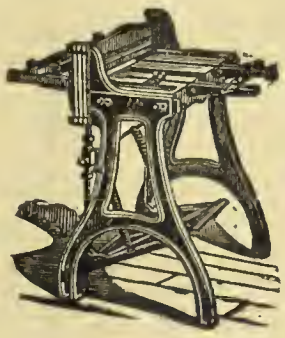
THE POORMAN M'F'G CO., - Canton, Ohio.

TINNERS' MACHINERY AND SUPPLY CO.,

SUCCESSORS TO
HIBBERD & SPINNER,
9 CLIFF STREET, - NEW YORK CITY.

Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery. Presses, Dies and Can Makers' Tools.

FULL LINE OF SUPPLIES.



POCOCK'S ECCENTRIC
FORMING MACHINE.



We invite your attention to this new Former for Tinners' and Sheet-Metal Workers' Rolls, on which we claim rapidity of operation, superior construction and durability. The back roll is moved by eccentrics instead of screws, and can be changed instantly from the smallest circle to the passing of a straight sheet. It will flare metal easier and better than any other machine in use. You can get closer to front roll, therefore bend a smaller circle. For sale by all leading jobbers. Send for circular to

O. POCOCK, Mfr
363, 365, 367 Clark St
CINCINNATI, OHIO
3-inch Rolls with Slip Rolls a specialty

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

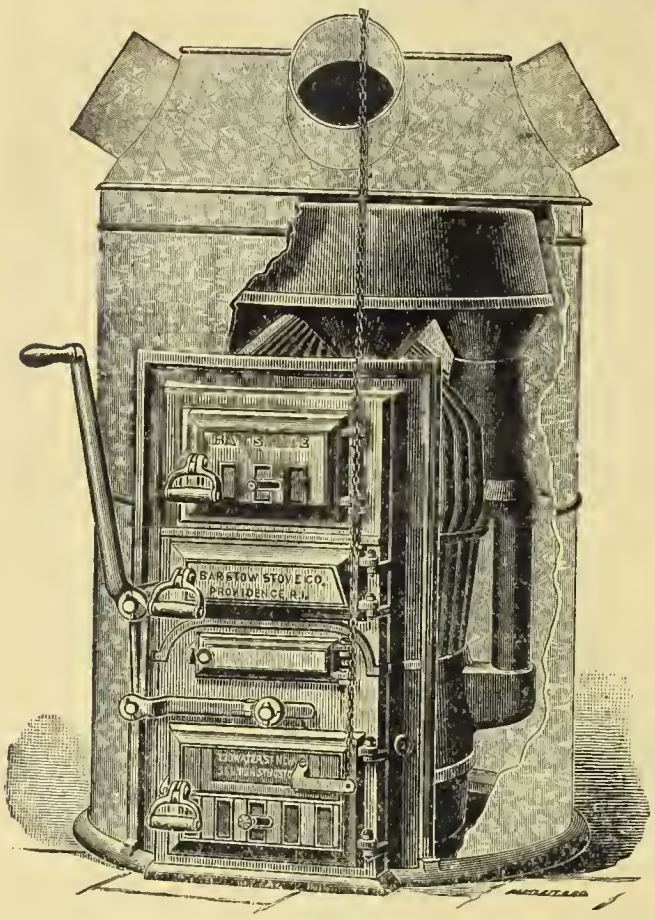
Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller
96-102 Reade Street, New York.

THE CELEBRATED

"Bay State" Furnace.

All Cast Iron, with Self-Cleaning Flues.
Adapted for Hard or Soft Coal.



Why not get our prices and send for descriptive circular?

BARSTOW STOVE COMPANY,
INCORPORATED,
BOSTON. PROVIDENCE, R. I. NEW YORK.

A FACT.

There is no "OLD STYLE" nor "OLD METHOD" Roofing Tin made in Philadelphia outside of N. & G. Taylor Company's Works.

Neither is there any old style nor old method "process."

Plates claiming to be such are made either through rolls or by acid flux.

We challenge contradiction.

Our Works are open.

A personal inspection of our manufacture and the manufacture of others will result in an increased use of the Genuine Taylor "OLD STYLE" brand, which is the **Standard Roofing Tin of America.**

N. & G. TAYLOR CO.,

Manufacturers,

PHILADELPHIA.

Established 1810.
86th Year.

THE GREAT CHURCH LIGHT REFLECTORS FOR OIL, GAS OR ELECTRIC LIGHT
I. P. FRINK.
551 PEARL. ST. N.Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.
Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK

TINNERS' TOOLS and MACHINES,

TINNERS' SUPPLIES,

186, 188 & 190 Water Street, and
248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOOK

By far the best Spout made. Greatly improved this season. More used every year than all others combined. Sold by leading jobbers everywhere, and to them by

CHARLES MILLAR & SON, Utica, N. Y.

Dealers Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY.

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON,

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. Also WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh. Pa.

HAMILTON'S
BEST REDIPPED AMERICAN ROOFING TIN

is DIPPED AND REDIPPED by HAND, and is NOT coated by machines through ROLLS like some plates that are lauded so highly by the makers, and the coating on Hamilton's Best Redipped is as heavy on the TOP half of the sheet as it is on the BOTTOM half. You have scales, test it. We can furnish machine coated plates with 20 lbs. of coating to the box of I. C. 20 x 28 at $11.50 per box, fully equal to any of the so-called extra coated plates.

JOHN HAMILTON,
PITTSBURGH, PA.

Our Guaranteed Brands
— OF —
ROOFING TIN

McClure's Re-Dipped,
McClure's Hand Coated,
O. B. T. Extra Coated.

McCLURE & CO.,
TIN PLATE AND METALS,
62 Second Avenue, PITTSBURGH, PA.

Index to Reading Matter, Page 58

Index to Advertisements, Pages 91 - 93.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

VOL. XLIII. NUMBER 12. | NEW YORK AND CHICAGO, MARCH 23, 1895. | ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

AMERICAN RADIATORS

HONESTLY CONSTRUCTED.
POSITIVE CIRCULATION.
ARTISTIC, SIMPLE, DURABLE.

Endless variety of styles.
Largest makers in the world.

AMERICAN RADIATOR COMPANY



NATIONAL.

NEW YORK. BOSTON. PHILADELPHIA. ST. LOUIS. MINNEAPOLIS. DENVER. LONDON, ENG.

111-113 Lake St., CHICAGO, ILL.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.
197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F&WCO

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS
FULLER & WARREN CO. TROY. N.Y.

HOT AIR PARAGON FURNACES

ISAAC A. SHEPPARD & CO
MANUFACTURERS
PHILADELPHIA, PA.
AND
BALTIMORE, MD.

SIX POINTS
1. FEWEST JOINTS. 2. EQUALIZED DRAFT
3. LARGEST RADIATING SURFACE
4. ABSOLUTELY SELF CLEANING
5. BALL BEARING GRATE
6. PERFECT ADAPTABILITY TO ANY KIND OF FUEL.

OUR FURNACE BOOK
"HINTS ABOUT HEATING"
MAILED FREE
IT WILL INTEREST YOU
IT MAY
HELP YOU

The Best Galvanized Iron

ought not to require specification, for a first-rate job of difficult work can't be done without it, and a first rate job costs less with it than an honest attempt at a first-rate job without it.

Every first-rate metal-worker probably knows that Apollo is true to gauge and flat and bendable.

It is of some little account that the top and bottom sheets of a bundle are cushioned against the bands; and so are delivered almost without blemish, just as the top and bottom sheets protect the inside sheets from the bands in other makes.

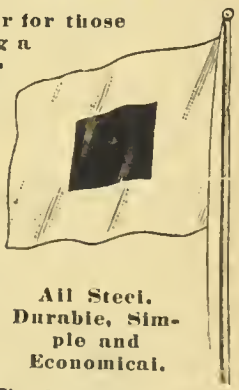
Apollo Best Bloom is the trade-mark. It costs a little more in large quantities. This is the only reason that other galvanized iron is sold at all.

APOLLO IRON AND STEEL COMPANY,
Pittsburgh Pennsylvania
WORKS AT APOLLO
Write for new Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES
HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.
"Kitchen Boiler Connections."
A Selection of Practical Letters and Articles
—RELATING TO—
Water Backs and Range Boilers.
Compiled from *The Metal Worker*.
71 Illustrations.
A Practical Helper. Price, $1.00.
DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

The COLD WAVE FLAG
Has no terror for those using a
FRONT RANK STEEL FURNACE.



Satisfaction guaranteed. Send for catalogue and price-list.
All Steel. Durable, Simple and Economical.
Front Rank Steel F'ce Co., St. Louis, Mo.

BOILERS. EXETER RADIATORS.
EXETER MACHINE WORKS, BOSTON, MASS Works, EXETER, N. H.

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO.,
Boston, Mass.

The Jenkins Automatic Air Valve has proved to be all we claimed for it—i. e., a Positive and Reliable Air Valve. The expansible plug is a special compound, and **manufactured expressly** for use in the **Jenkins Automatic Air Valve.** It does not deteriorate or lose its flexibility under the action of heat or steam. **With the Jenkins Automatic Air Valve, you should connect with a drip pipe, thus insuring a positive circulation.** We guarantee them to be as represented. Our Trade-Mark is on every valve.



JENKINS BROS., NEW YORK, BOSTON, CHICAGO, PHILADELPHIA

KIELEY'S - STEAM - SPECIALTIES.

Pump Governor, Return Steam and Drain Traps, Steam and Water Reducing Valves, Noiseless Back Pressure Valves, Water Arches and Oil Separators.

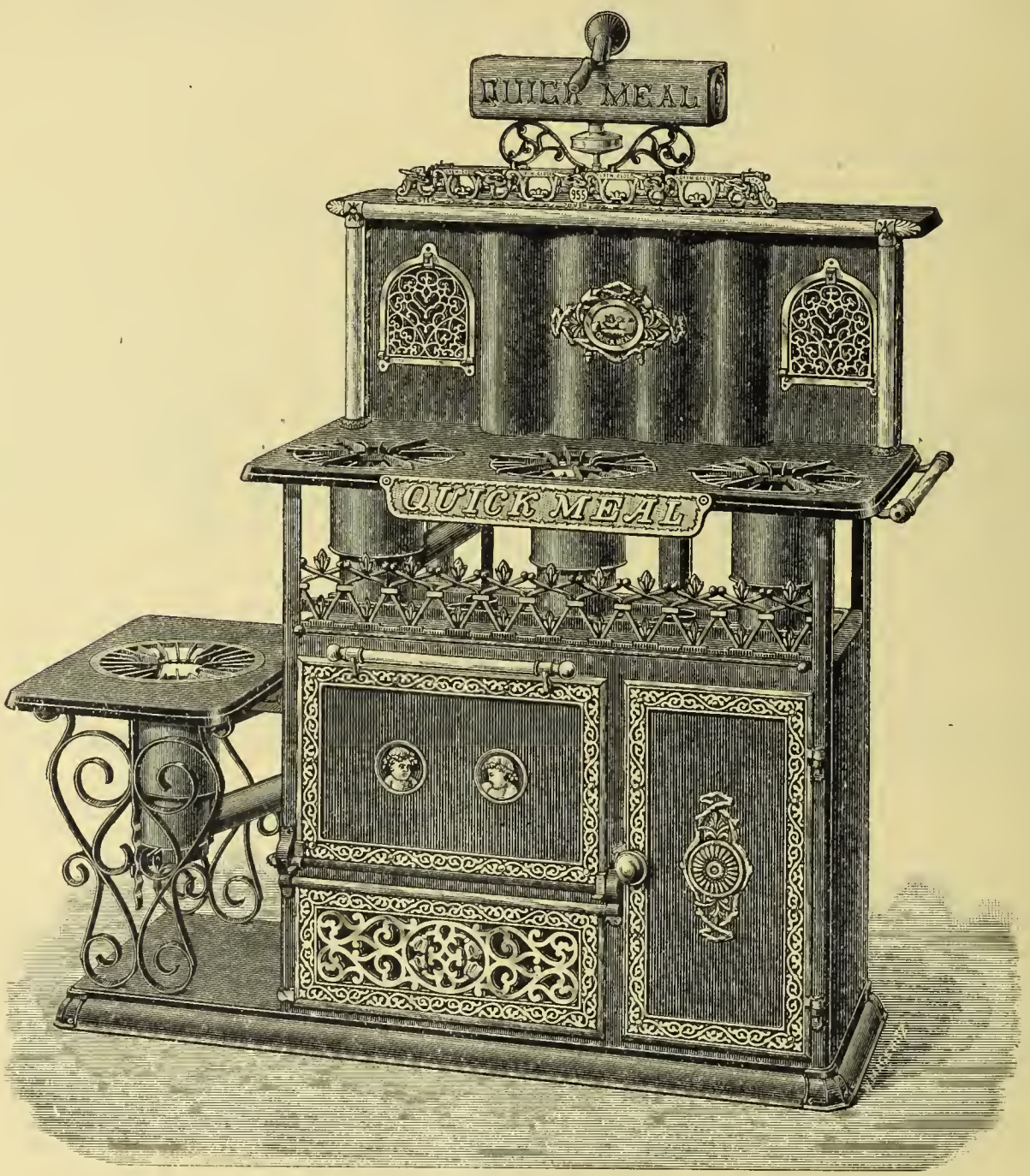
T. KIELEY, 7-17 W. 13th St., NEW YORK.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

ST. LOUIS.

Also the most complete line of Quick Meal Gas Stoves and Ranges.

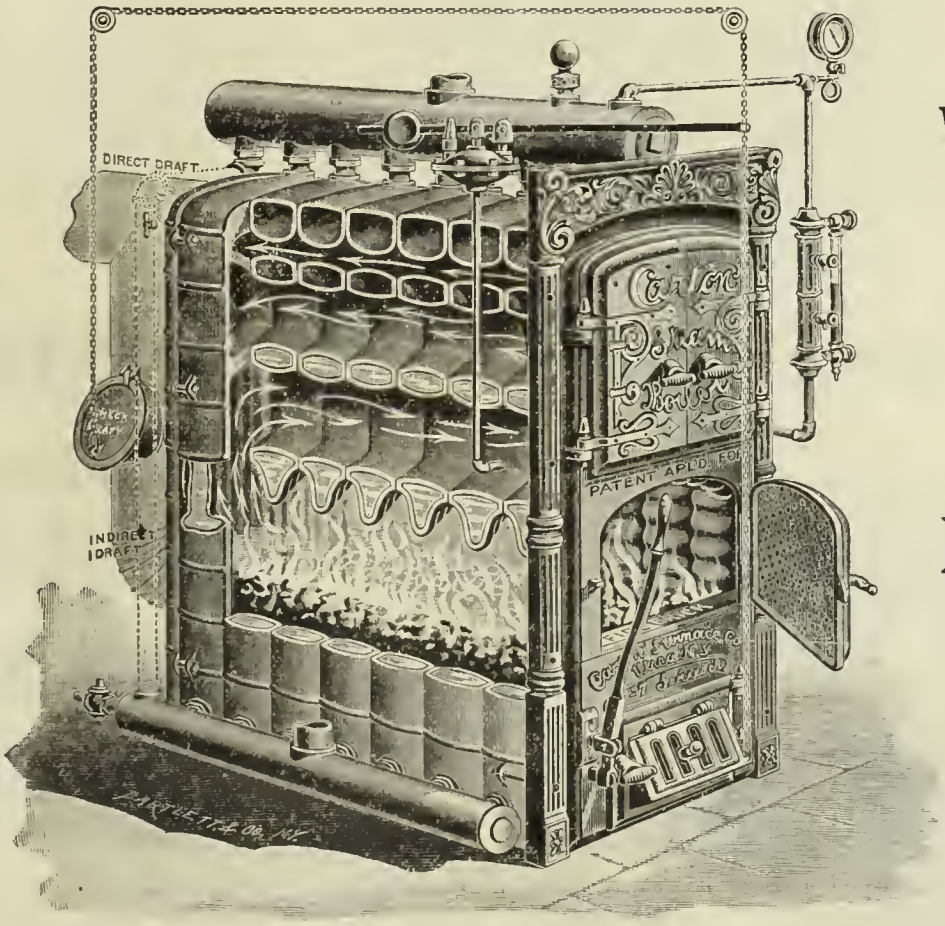


Our Steam Boiler.

Nipple Connections.

No Packed Joints.

Easily Cleaned.



Vertical Water Ways.

Double Corrugated Fire Box.

For HARD or SOFT COAL.

Mr. William J. Baldwin, M.E., the Heating Engineer of New York, says in his trial of this boiler:

"The equivalent evaporation per pound of combustible from water at 212° Fah." "to 5 pounds pressure of steam is 11.02 pounds of water."

"The equivalent evaporation of water from 212° Fah. to 5 pounds steam pressure," "per square foot of average boiler surface per hour, is 2.368 pounds of water."

"You will note that when the rate of combustion is equal to 5 pounds of good an-" "thracite coal per square foot of grate per hour, that one square foot of average boiler" "surface evaporated sufficent steam for 10 square feet average radiation; an exceed-" "ingly high efficiency and rarely obtained in practice."

"The low temperature at which the gases of combustion entered the chimney," "ranging from 3 to 21 degrees above the temperature of the steam, shows that the" "boiler utilizes about all the available heat of the fuel."

Send for our NEW HOT WATER AND STEAM CATALOGUE AND PRICE LIST and WRITE for DISCOUNTS.

SOLD TO THE TRADE ONLY.

MANUFACTURED BY

CARTON FURNACE CO., UTICA, N. Y.

ESTABLISHED IN 1847.

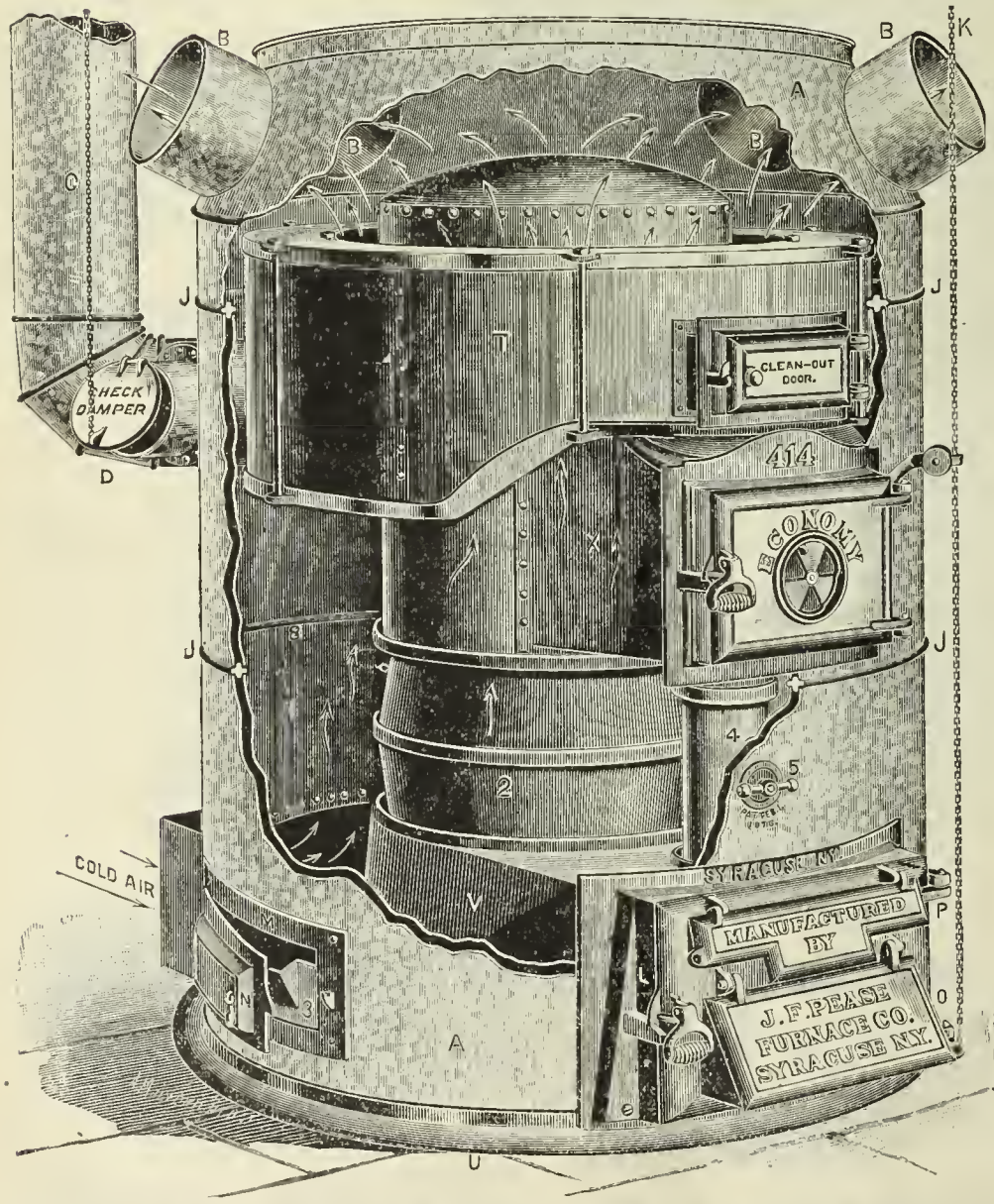
HERE IS ANOTHER!

(1885, 3 Patterns. 1895, 21 Patterns.)

Our 1895 Pattern Economy Furnace

Will soon be ready for the trade. One size has been in operation all winter and has been **thoroughly tested before** the trade is asked to experiment with it. We have found it fully up to the standard of excellence we have established (which others acknowledge by imitation) and we ask the trade to

TAKE OUR WORD FOR IT



FEATURES: :

LOW IN PRICE.
LOW IN STATURE.

Steel Plate Construction.
Large Radiating Surface.
Thorough Distribution.
Revolving Grate.
Rocking Grate.
Flat Grate.
Air Blast Attachment

It is no snap shot, but, like all our other lines, the outcome of mature judgment and actual experience.

J. F. Pease Furnace Co.,

Main Office and Works, **SYRACUSE, N. Y.**

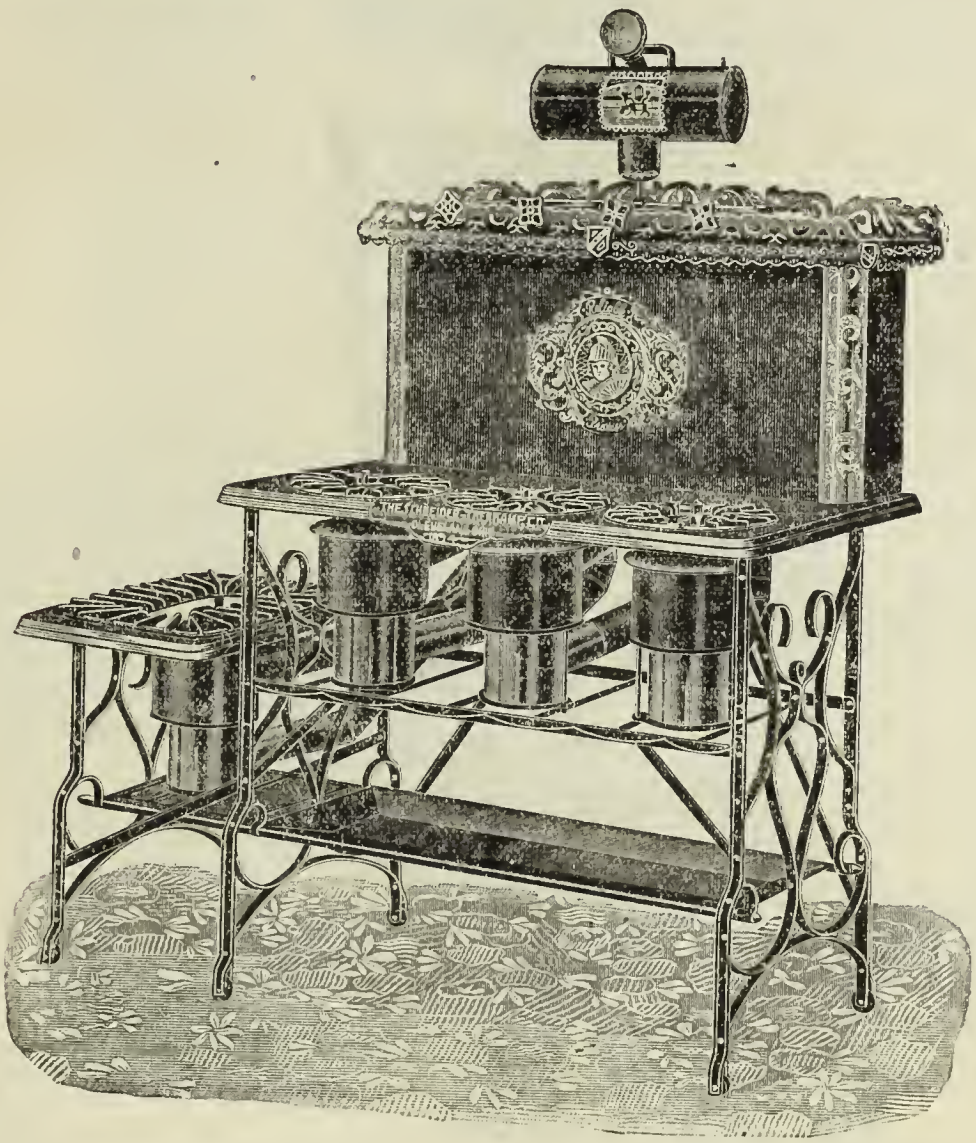
86 Lake St., Chicago. 228 Franklin St., Boston
Franklin & Burnham, 284 Pearl St., New York.
Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo.
E. E. Palmer, Mgr., 1640 N. Third St., Harrisburg, Pa.

See Our Improved Air Blast Apparatus, Next Issue.

There are OTHERS,

But none that compare with the "Reliable."

SEE ? ? ?



This is not the only one,

Oh my, no. There ARE others,

as illustrated in our 1895 Catalogue, which can be had by writing

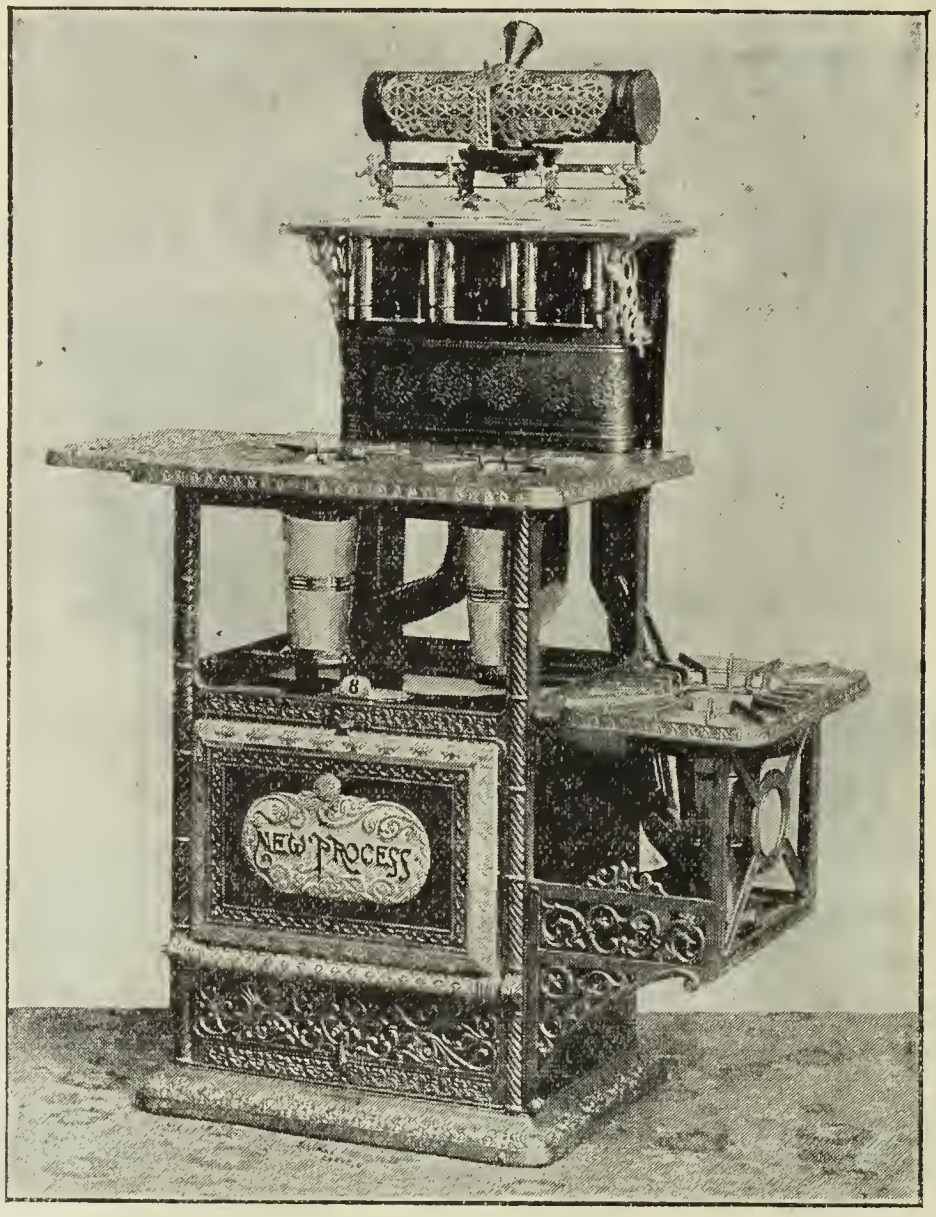
THE SCHNEIDER & TRENKAMP CO.,

67 Lake Street, Chicago. Cleveland, O.

OR OUR AGENTS:

THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo.
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigs
CHAS. F FOX Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.
S. FAITH & CO., Philadelphia, Pa.—Eastern Pennsylvania and New Jersey.
HUNNICUTT & BELLINGRATH, Atlanta, Ga., and Vicinity.

A Good Baker—A Record Breaker.
A HOME MAKER!
No Wonder 'tis such a "Taker."
The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

—MADE ONLY BY—

THE STANDARD LIGHTING CO.,
CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

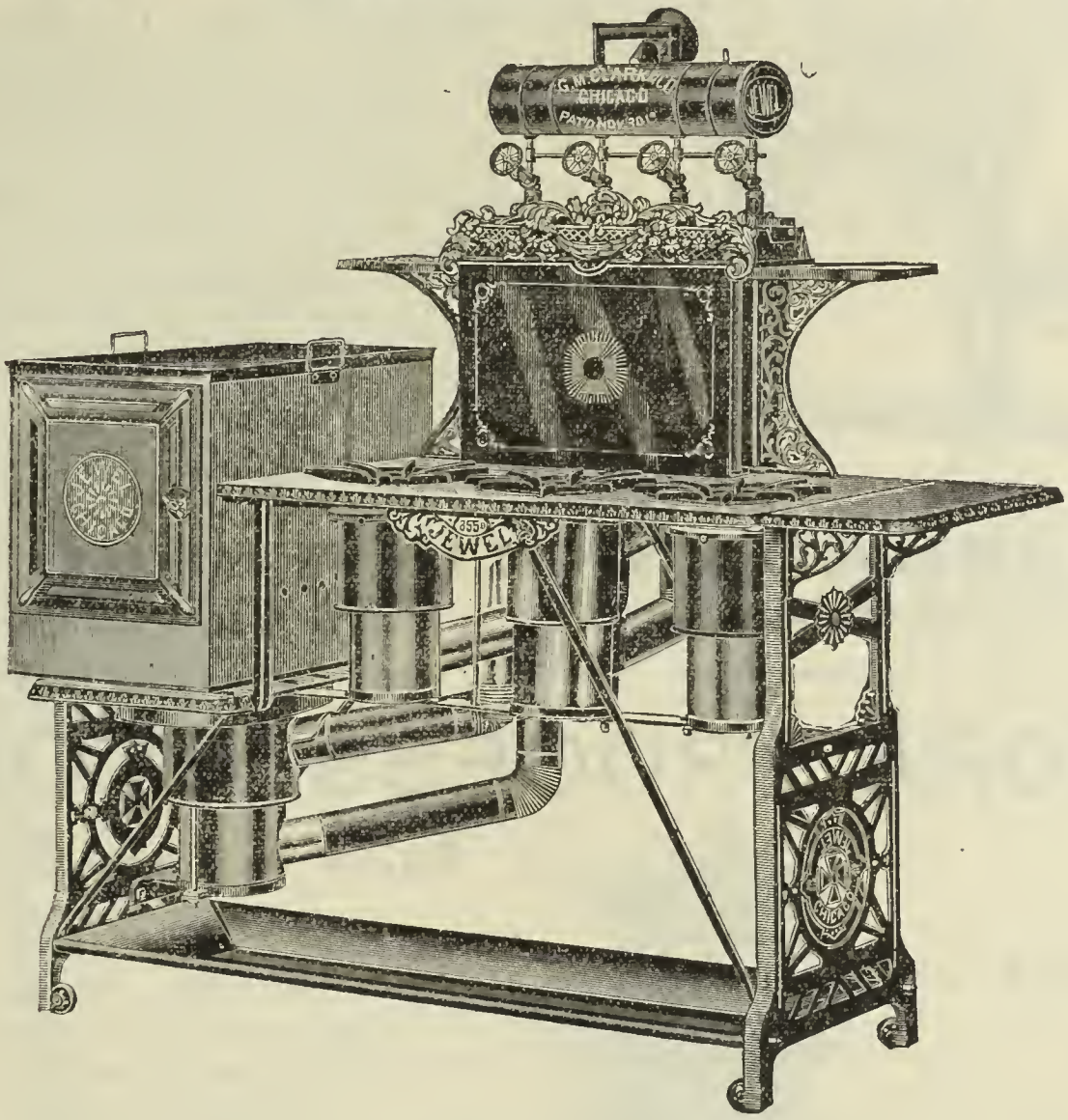
Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co, Terre Haute, Ind.
Milton Rogers & Sons, Omaha, Neb.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
H. Wetter Mfg. Co., Memphis, Tenn.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

WRITE FOR CATALOG.

George M. Clark & Company,

MAKERS,

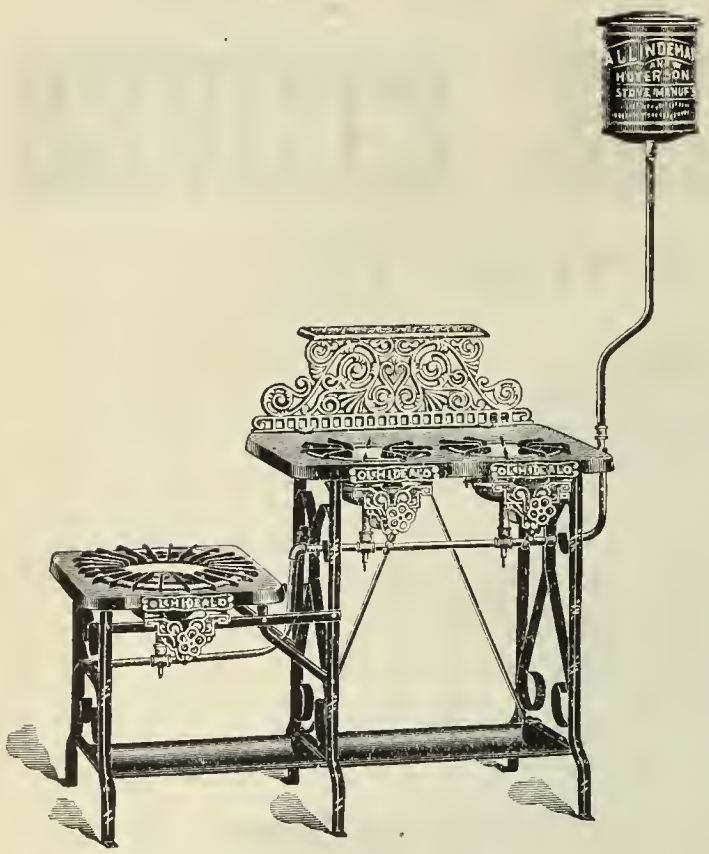
149-161 Superior Street, - - CHICAGO.

SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
BARSTOW STOVE CO., New York, N. Y.
W. W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

SOMETHING ENTIRELY NEW.

The L. & H. IDEAL



Burns a flame like a Process, but twice as strong. Patented. It is truly an Ideal gasoline stove. Price low and within the reach of everybody. The latest invention in Gasoline Stoves. Send for new catalogue. It contains the largest assortment of Stoves, Ranges, Ovens, &c., for gas, gasoline and kerosene.

A. J. LINDEMANN & HOVERSON CO.,

Branch House, Chicago, Ill. MILWAUKEE, WIS.

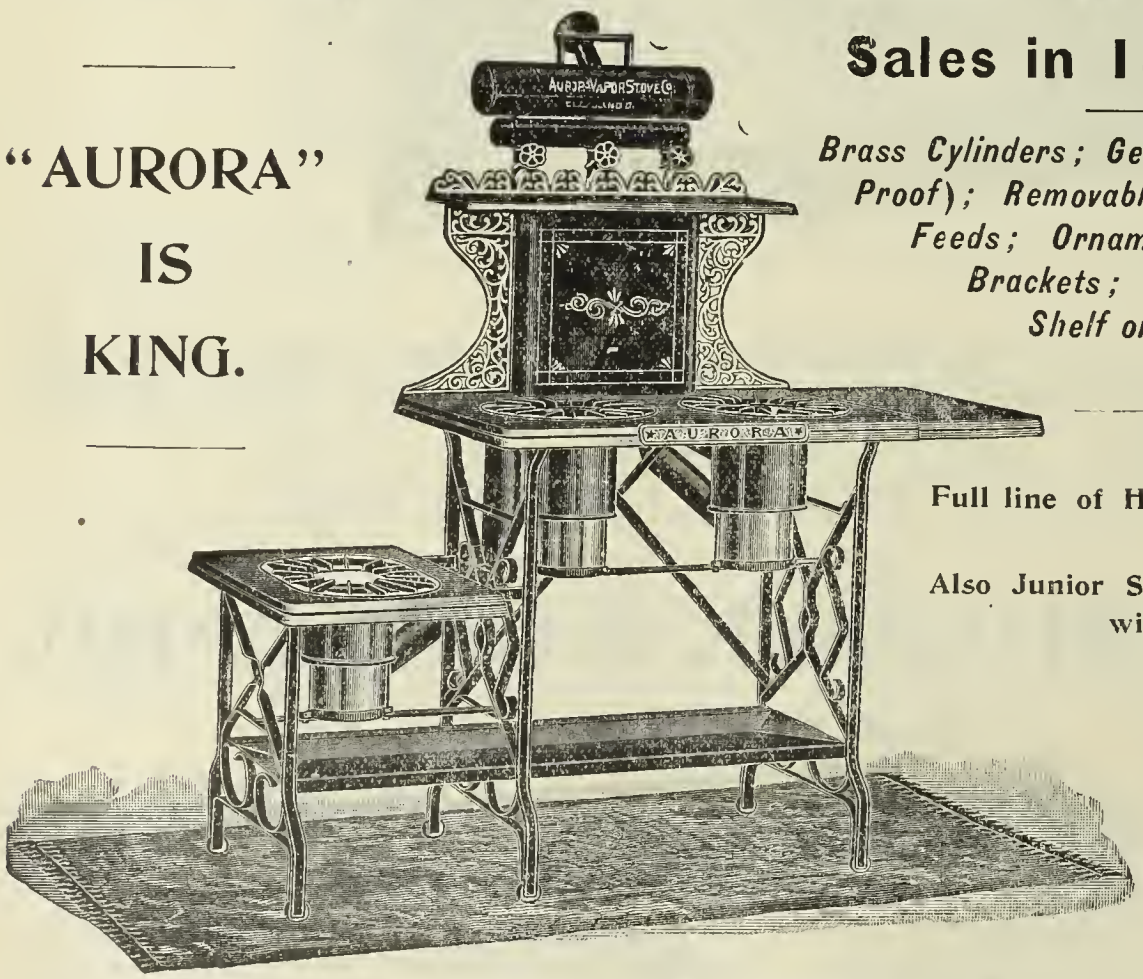
P. S.—Notice this advertisement. It will show a new improved stove every week.

AURORA PROCESS STOVES

"AURORA" IS KING.

Sales in 1894 Doubled.

Brass Cylinders; German Silver Points (Rust Proof); Removable Drip Valves; Sight Feeds; Ornamental High Shelf Brackets; Extra Extension Shelf on all Stoves.



Full line of Hot Generating Stoves and Ranges.

Also Junior Stoves, High and Low, all with Drop Tank.

Fine line of Gas Ranges and Hot Plates.

We defy all Competition on finish, operation and style of "Aurora" stoves.

Send for 1895 Catalogue, now ready.

AURORA VAPOR STOVE CO., CLEVELAND, OHIO.

AGENTS:—THE PERRY STOVE CO., Albany, N. Y. H. W. PEAK, Fort Worth, Tex. JACOB RETTERER, Chicago, Ill. JAS. BEAKEY STOVE CO., St. Louis, Mo JANNEY, SEMPLE & CO., Minneapolis, Minn D. B. BAYLESS STOVE CO., Cincinnati, O. MAHOOD & Co., Philadelphia, Pa.



IT has been said that in America TWO CLASSES of Stoves and Ranges are sold, viz.:

"GARLANDS"

— AND —

OTHERS.

At the very head and front of the "Others" stands our new line of

"MICHIGAN"

Stoves and Ranges, which are unquestionably the latest, handsomest and most artistically designed Stoves and Ranges to be found upon the market at anything like the price at which they are sold.

They are made under our own supervision; by same workmen and out of the same material from which "Garlands" are made, and this fact of itself should be sufficient to cause them to be preferred by discriminating merchants and consumers, as against all other brands, excepting the invincible line of "Garlands."

WILL H. BRADLEY DES.

GARLAND STOVES AND RANGES
The World's Best

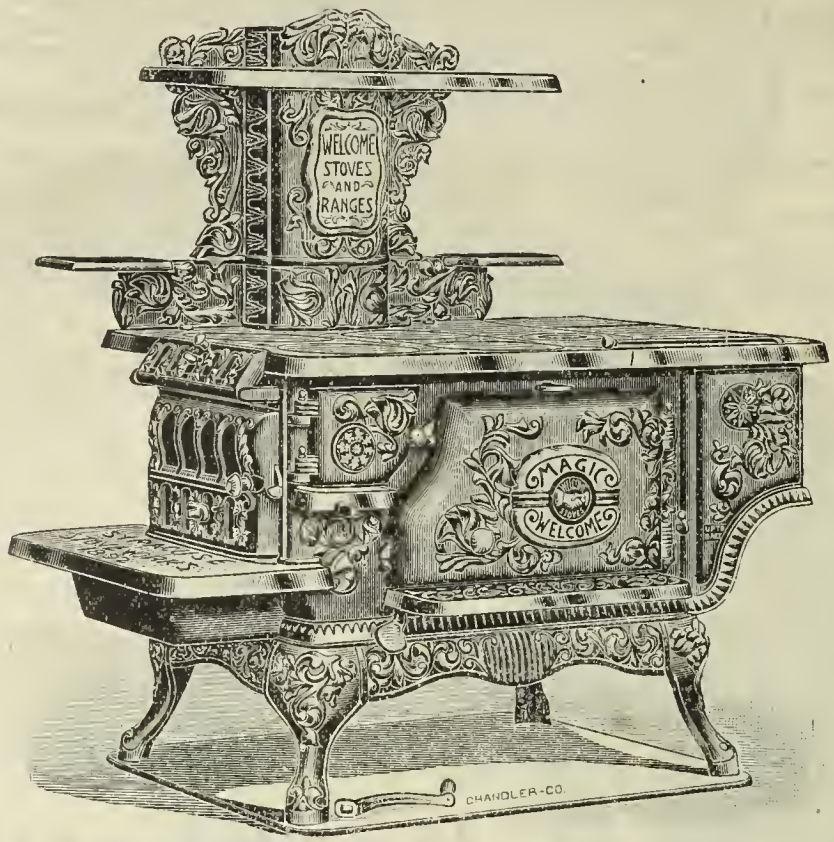
The Michigan Stove Company,

Largest Makers of Stoves and Ranges in the World,

DETROIT, CHICAGO,
BUFFALO, NEW YORK CITY.

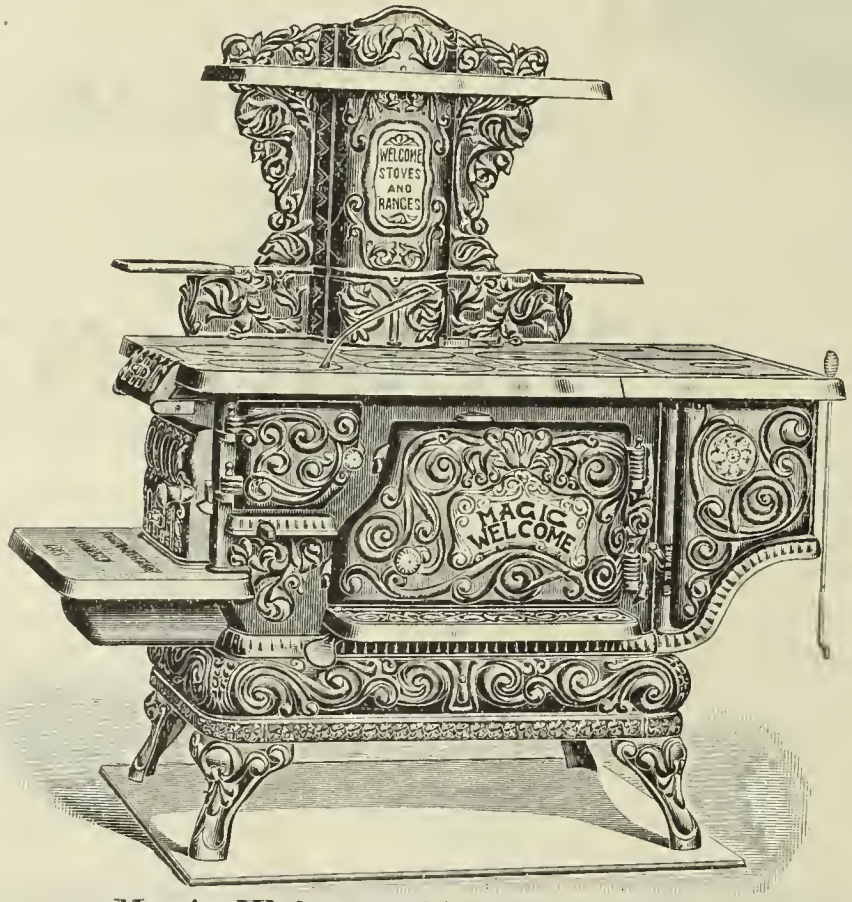
MICHIGAN STOVES AND RANGES

Welcome Stoves and Ranges.



Magic Welcome Four-Hole Range.

Acknowledged by all to be the best Four-Hole Range made, and handled by the best dealers in Stoves and Ranges. Imitated by many. None equals the original.



Magic Welcome Six-Hole Range.

To gratify a demand so urgent, we have made our Magic Welcome Six-Hole Range, giving our customers a complete line of Magic Welcome Ranges. Four and Six Holes.

WILL THE WISE DEALER TAKE HEED?

Manufactured by Syracuse Stove Works,

Syracuse, New York.

KERNAN

Warm Air Furnaces.

A Large Plant Devoted WHOLLY to

This Industry.

FURNACES

—OF ALL—

SIZES. STYLES. GRADES.

Light Weight.

Medium Weight.

Heavy Weight.

—ALSO—

Cast Iron Furnaces. **Steel Plate Furnaces.**

Soft Coal Furnaces.

Send for Catalogue. Secure the Agency.

Kernan Furnace Company,

CHICAGO, ILL. UTICA, N. Y.



CHARLES NOBLE & CO.
LIBERTY STOVE WORKS
PHILA. PA.

Liberty Stove Works.

HOME LIBERTY RANGE,

With Horizontal Boiler.

TWO SIZES.

Five or six holes. Collar on top or back.
Right or left hand ovens.
Plain or duplex grates.
With or without High Closet.
With Low Closet or **Base.**

Especially adapted to BUILDING TRADE.



PRIZE LIBERTY RANGE.

For VERTICAL BOILER.

WITH ALL THE VARIATIONS AS ABOVE.

Also adapted for setting in between brick jambs.



PRIZE LIBERTY RANGE,

With Feet and Skirting.

Open or closed ends, with the same variations.

Correspondence solicited.

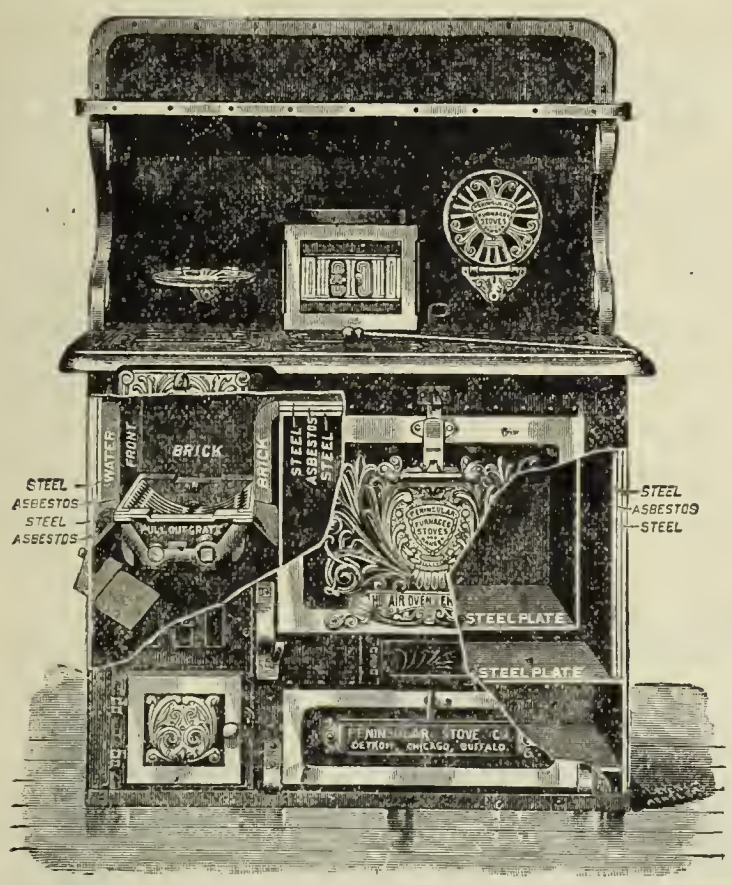
CHARLES NOBLE & CO.,

PHILADELPHIA.

AT POPULAR PRICES

PENINSULAR

WROUGHT STEEL RANGES.



DO YOU SEE THEM?

Double Walls of Steel

WITH

Asbestos Lining,

Which Concentrates

All the Heat Around the Oven

and gives

More Intense Heat on the Cooking Surface,

Making them

Quick Bakers

and Superior Cookers.

COMBINATION POUCH and SWING FEED

FOR COAL AND WOOD.

GRATE AND FRAME

Can be withdrawn without Removing a Single Plate or Bolt.

We make all Styles

OF

RESERVOIR ATTACHMENTS,

and can supply

Any Kind of Top

OR

Combination Desired.

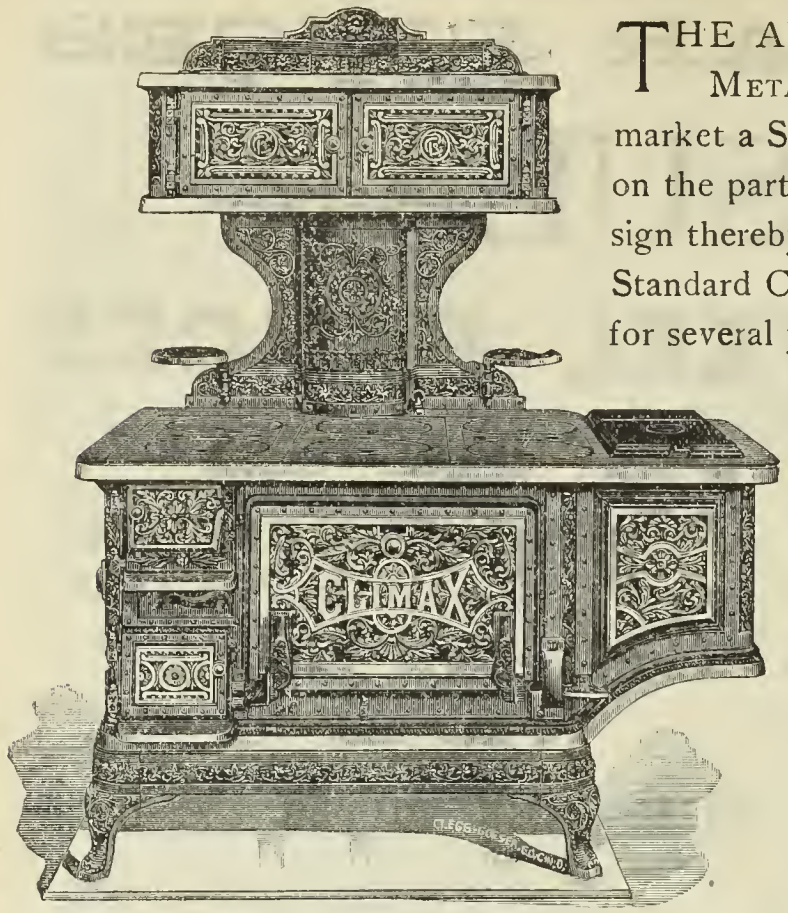
Write for Catalogue and Discounts.



The Largest and Best Equipped Steel Range Manufacturers in the World.

THE PENINSULAR STOVE COMPANY,

DETROIT, CHICAGO, BUFFALO.



THE ANNOUNCEMENT in a recent issue of THE METAL WORKER that we are soon to place on the market a Steel Climax Range having prompted the inquiry on the part of some of our patrons as to whether we design thereby to abandon the manufacture of our Celebrated Standard Climax Range, which has maintained supremacy for several years as an established leader of its class and against which not a single complaint has been filed in our office, we desire by this to inform the trade that the reputation of the Climax Range and constantly increasing demands for same is such as to preclude the possibility of abandonment if we felt disposed to do so. The Range, we are pleased to say, is more popular than ever, and the manufacture of same will be continued in all its varied conventional styles and sizes, and we sincerely trust that none will be deceived into a belief that an ***imitation*** now being offered to the trade is as good as the initial construction, which can only be procured of

TAPLIN, RICE & CO., AKRON, OHIO.

THE

Warren Steel Range.

IMPORTANT ANNOUNCEMENT.

To Jobbers and Retailers of Steel Ranges:

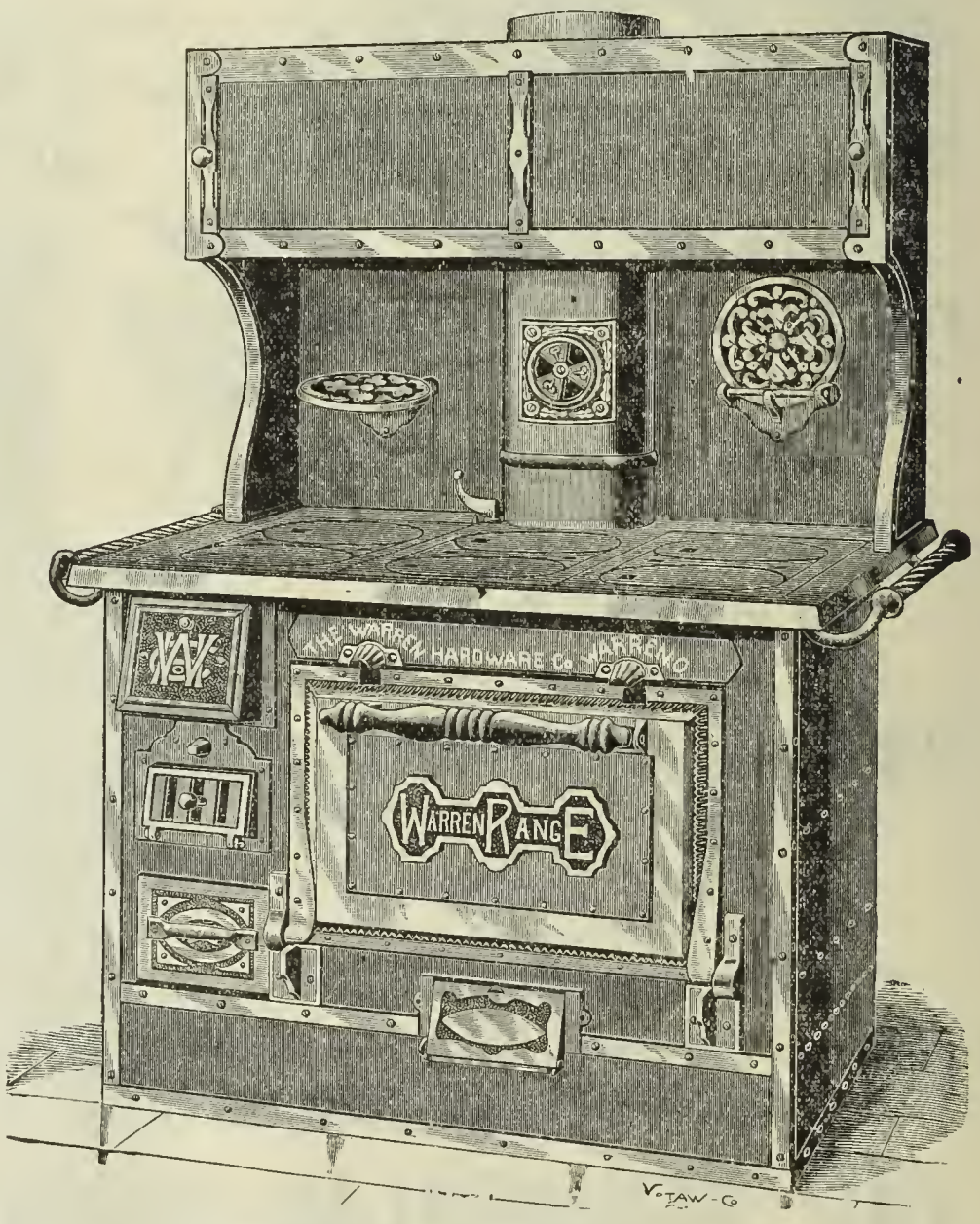
Don't fail before placing your order for Steel Ranges to get catalogue and prices on our new line of Warren Ranges for 1895. New and original and the finest line of Ranges on the market. With Duplex Grate to draw out front of range without disturbing fire linings. Full size opening of oven 18 x 20 x 14, 20 x 22 x 14 and 22 x 23 x 14. Lined throughout with asbestos. Write for prices and catalogue.

MANUFACTURED BY

THE WARREN HARDWARE CO.

7 Market Street,

WARREN, OHIO.



---

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa

Cleveland's Population is 362,000.
Cleveland has Nine Railways.
Cleveland has 60,000 Mechanics.
Cleveland has Six Opera Houses.
Cleveland has One Ferrosteel Company.
Cleveland has over 200 Churches.
Cleveland has 30 Musical Associations.
Cleveland makes the Largest Telescopes.
Cleveland has 500 miles of Streets.
Cleveland has an area of 30 miles.
Cleveland has One Ferrosteel Company.
Cleveland has 250 miles of Street Railways.
Cleveland's Water Works cost over $6,000,000.

Cleveland has One Ferrosteel Company.
Cleveland's Vessels are worth $18,000,000.
Cleveland is the largest Shipbuilding Port.
Cleveland has the largest Bolt and Nut Works.
Cleveland has over 500 Lodges and Societies.
Cleveland has One Ferrosteel Company.
Cleveland has 14 Libraries and Reading Rooms.
Cleveland was founded in 1796.
Cleveland has 200 miles of Cable and Electric Ry.
Cleveland's Public Library has over 70,000 Volumes.
Cleveland has 2,500 Manufacturing Establishments.
Cleveland has One Ferrosteel Company.
Cleveland's Main Viaduct cost over $2,000,000.

THE OFFICES OF

The Ferrosteel Company,

WADE BUILDING,

THE WAREROOMS OF

The Ferrosteel Company,

17 and 19 LONG STREET,

CLEVELAND, OHIO.

FOUNDRY: **Chagrin Falls, Ohio.** (10 miles from Cleveland.)

SOLE MANUFACTURERS OF **"FERROSTEEL"**

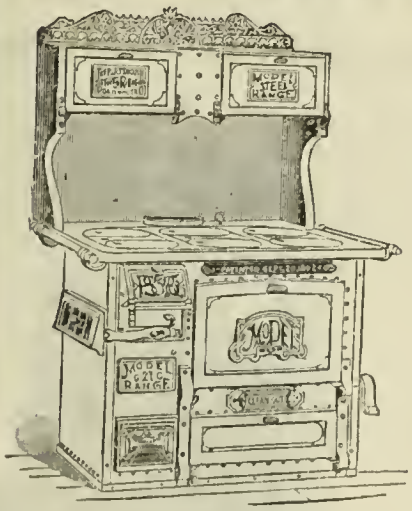
RANGES! RANGES!! RANGES!!!

And HOT AIR REGISTERS.

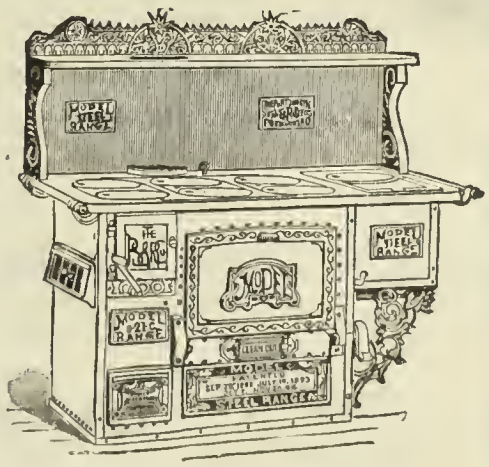
BEHOLD! The Leaders.

You can't see the others—
too far behind.

THE "MODEL" STEEL RANGES



have done more to popularize Steel Ranges than any other one factor. Why? Because they are absolutely the best, and the price brings them within the reach of all.



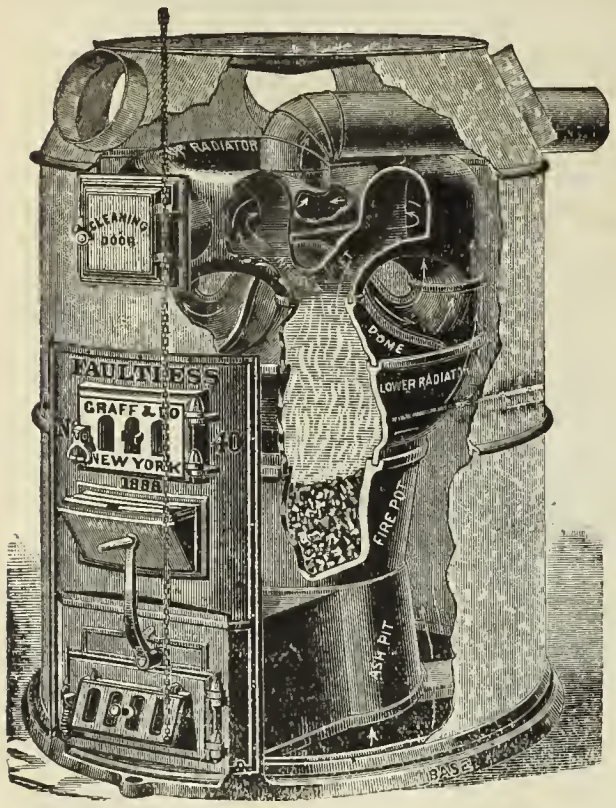
Agents:
R. ROBINSON & SONS, Chicago.
C. F. HAKE & SONS, Cincinnati.
HOME STOVE CO, Indinaapolis.
W. E. ANTHONY & CO., Detroit.
BRADLEY, MUNK & CO., Columbus.

THE

Portsmouth Stove AND Range Co.,

Portsmouth, O.

FAULTLESS.



SUPERIOR GOODS.

FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.
HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.

Faultless, Elegant and Columbian Ranges.

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.

FREE

THE TRIUMPH - - FURNACE ESTIMATE BOOK.

The Principles of Heating and Ventilation, with Facts and Figures.

The Triumph Picture Book.

THE DEALERS' BEST LINE.

The Triumph Special,
for hard coal. 5 sizes.

The Triumph all Cast,
hard or soft coal. 5 sizes.

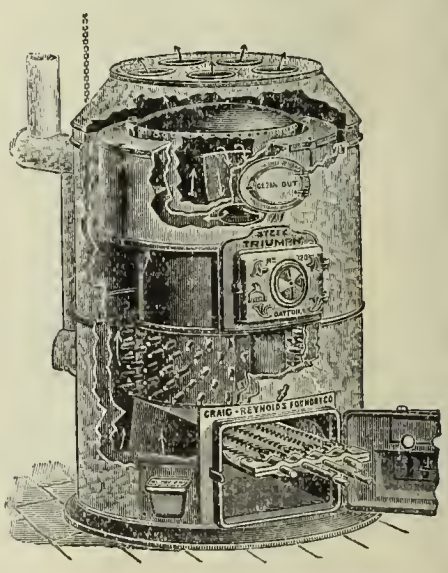
The Triumph King,
hard or soft coal. 4 sizes.

The Triumph Steel,
hard coal. 5 sizes.

The Triumph Air Blast,
soft coal. 5 sizes.

The Triumph Combination
for hot water and air. 5 sizes.

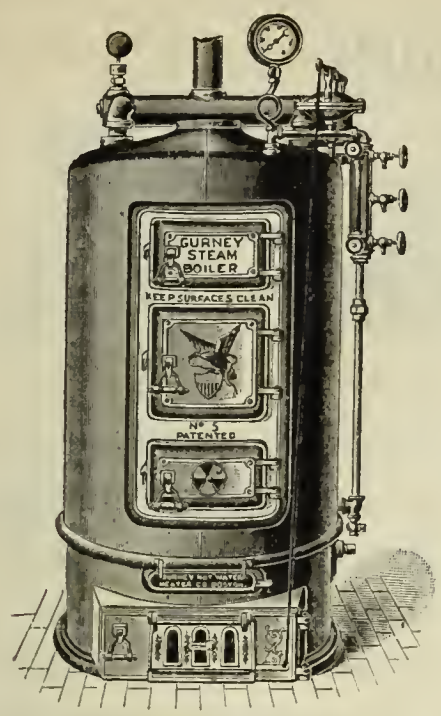
Every Dealer Ought to Have One.



1895 CATALOGUE OF THE TRIUMPH FURNACES.

The Craig-Reynolds F'd'y Co,
DAYTON, OHIO.
WESTERN BRANCH:
GEO. D. HOFFMAN, Mgr.,
82 Lake St., Chicago, Ill.

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



Gurney Steam Boiler.

A GUARANTEE OF EXCELLENCE.

The Name Gurney

Used in connection with **Heating Apparatus** denotes **FINEST PRODUCTION.**

HOT WATER HEATERS, STEAM BOILERS, RADIATORS.

ALWAYS EQUAL TO THE OCCASION.

Send for Trade Catalogues.

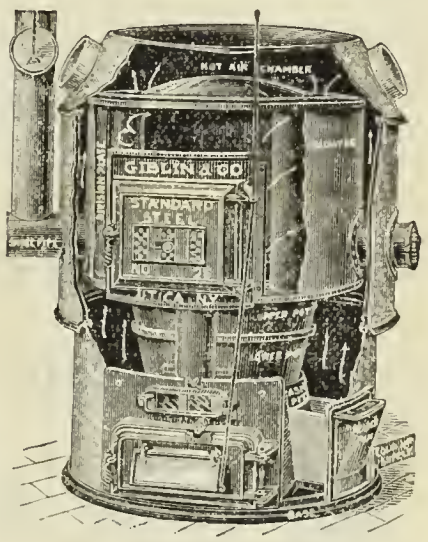
SOLD ONLY TO THE TRADE.

GURNEY HEATER MAN'F'G CO.,

163 Franklin St., Cor. Congress,

BOSTON, MASS.

THE INCREASING DEMAND FOR THE STANDARD STEEL FURNACE



Is Evidence of its Great Popularity.

You can have our Catalog for the asking.

IT IS A COMPETITION HEATER

Both in QUALITY and PRICE.

YOU CAN GET BUSINESS AND HOLD IT WITH THIS FURNACE.

GIBLIN & CO.,

MAKERS,

UTICA, - N. Y.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

139, 141 and 143 CENTRE STREET; - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, "**Health and Comfort in the Home Circle.**"



Information

—ON—

School Work.

THE heating, ventilating and sanitary work in Schools, Court Houses and like Public Buildings is a branch of engineering by itself and should be undertaken only by those who are trained to the work, working from detail plans and specifications and using apparatus manufactured especially for such work. This comes under a special department of this company, managed by competent engineers and superintendents and is undertaken only from the home office. If any dealer has knowledge of where a system may be installed or can secure the contract for its installation a liberal percentage will be allowed and we will carry out the practical part of the matter to a finish.

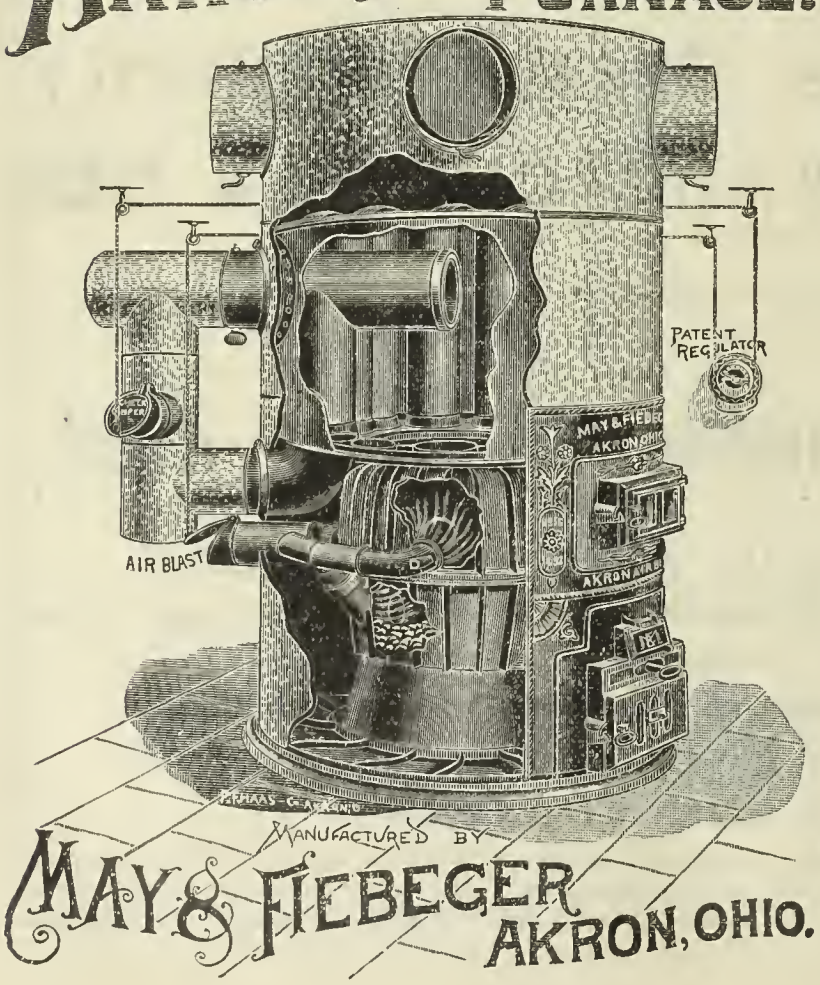
CORRESPONDENCE IS INVITED.

Branches: Chicago—82 Washington St.
St. Louis—1206 Olive St.
Pittsburg—306 Wood St.
Webster City, Iowa.

THE **Peck-Williamson Htg. & Ventlg. Co.,**
CINCINNATI, O.

"Nothing Succeeds Like Success."

AKRON AIR BLAST FURNACE.



—THAT—

"THE AKRON AIR BLAST FURNACE

Has no equal as a Hot Air Furnace for

HARD OR SOFT COAL,"

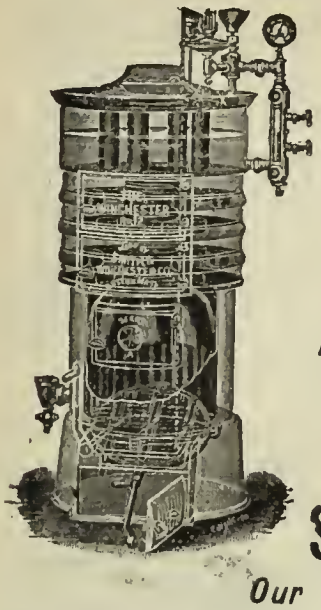
Is the verdict of thousands of dealers and purchasers.

SEND FOR CATALOGUE

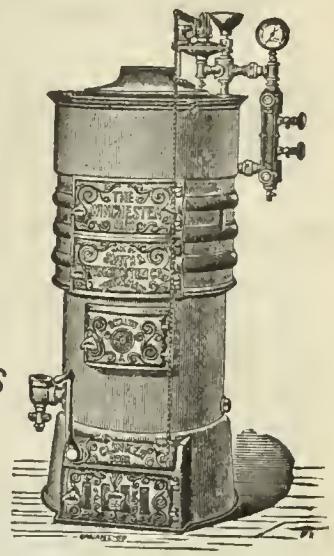
Increase your trade by securing the agency of

THE FURNACE

That has revolutionized the furnace trade.



The Winchester



Has more ***COMMENDABLE***

And less ***OBJECTIONABLE FEATURES***

Than any Heater on the Market.

—MADE BY—

SMITH & WINCHESTER CO., Boston, Mass.

Our prices on these Heaters will please you. Send for them.

ROYAL HEATERS.

SOLD ON THEIR MERITS. NOT ON THEIR ANTIQUITY.

HOT WATER. STEAM. HOT AIR. COMBINATION.

LARGEST ASSORTMENT OF STYLES AND SIZES.
CATALOGUES GIVE FULL DESCRIPTION.
CORRESPONDENCE SOLICITED.

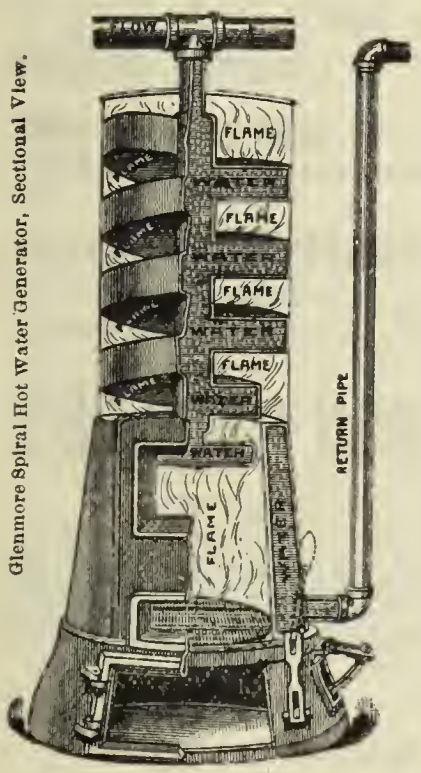
MANUFACTURED BY

HART & CROUSE.

UTICA, N.Y.

NEW YORK. 211 WATER ST.

CHICAGO. 79 LAKE ST.



Glenmore Spiral Hot Water Generator, Sectional View.

THE GLENMORE

Spiral Hot Water Generator.

(PATENTED.)

For General Heating Purposes, but Especially Adapted to House Heating.

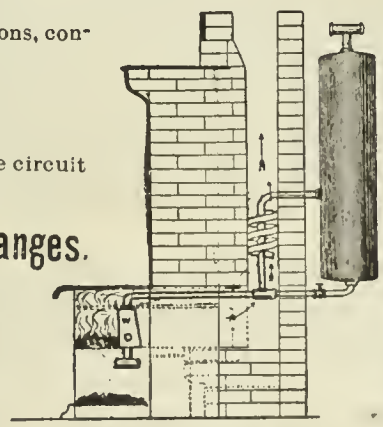
COMMENDATORY POINTS:

Simple construction. Practically composed of two sections, consequently few joints and nothing to give out.
Large heating surfaces
Products of combustion fully utilized.
Instantaneous generation of hot water.
Free and easy circulation.
Easily cleaned fire surfaces.
Hot water may be drawn off at any point along the pipe circuit without materially affecting the heating service.
Grate conducive to economy in fuel.

Spiral Water Back Attachment for Kitchen Ranges.

By utilizing waste heat, this water back extends the capacity of a kitchen boiler, and makes it a valuable heating auxiliary, especially in spring and fall, when the regular heating apparatus is too powerful.

☞Send for Pamphlet.



Spiral Water Back Attachment for Kitchen Ranges.

GLENMORE FOUNDRY AND MACHINE CO.,

73d ST. and WOODLAND AVE.
PHILADELPHIA, PA.

SECURE AGENCY EARLY.

Send for Catalogue without delay.

The Plummer Steam Heater.

12th SEASON, BUT "UP TO DATE."

The Leader Hot Water Heater

PUTNAM FOUNDRY & MACHINE CORPORATION, - PUTNAM, CONN.

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student, and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

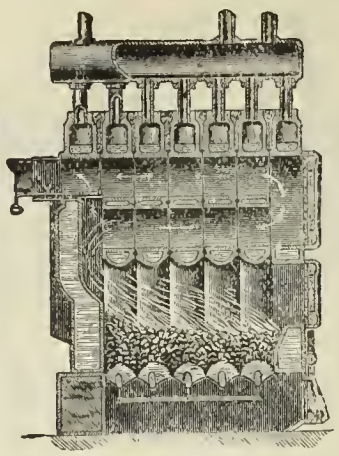
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



MERCER BOILER.

The H. B. Smith Co.,

MANUFACTURERS OF

Steam and Water HEATING APPARATUS,

For Public Buildings and Private Residences.

SPECIALITIES:

MERCER'S Patent Improved Sectional Boiler, for Hot Water and Steam Heating, adapted for hard or soft coal.
GOLD'S Improved Sectional Boilers.
MILL'S Improved Sectional Boilers.
THE UNION Hot-Water Radiators.
REED'S Improved Cast-Iron Radiators.
GOLD'S Indirect Pin Radiators, with Nipple and Flanged Joints.
BRECKENRIDGE'S Patent Automatic Air-Valves.

Office & Warerooms, 137 Centre St., New York.

FOUNDRY, WESTFIELD, MASS.

STEAM HOT WATER WARM AIR

FOR HEATING ALL CLASSES OF BUILDINGS

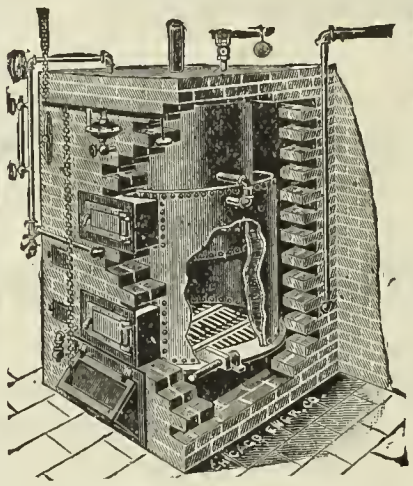
CAPITOL HEATERS

OUR LITTLE BOOK "WARMTH FOR WINTER HOMES" TREATING OF HEATING, RADIATION, VENTILATION ETC IS INTERESTING AND INSTRUCTIVE WE SEND IT FREE

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON



HAXTUN BOILER

FOR STEAM AND HOT WATER HEATING

Magazine with Front Feed—can use **HARD or SOFT COAL.**

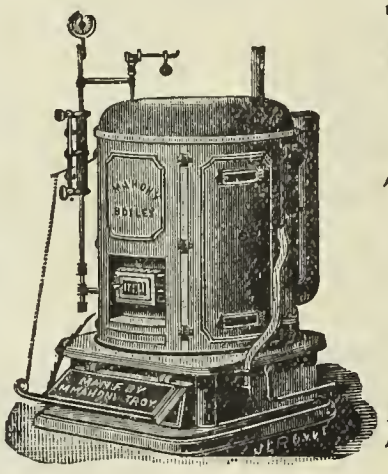
BEEN IN SUCCESSFUL USE 18 YEARS.

—MADE BY—

KEWANEE BOILER CO., Kewanee, Ills.

Chicago Office, 96 Lake Street.

Write us for New Catalogue and Prices.



THE MAHONY BOILERS.

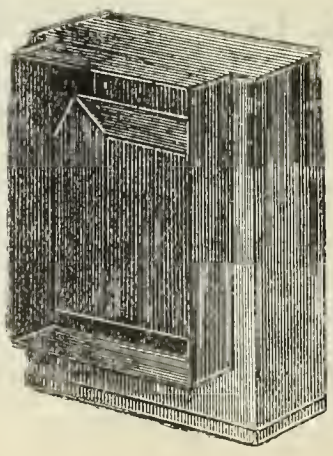
For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.



Novelty Ventilated Wall Pipe,

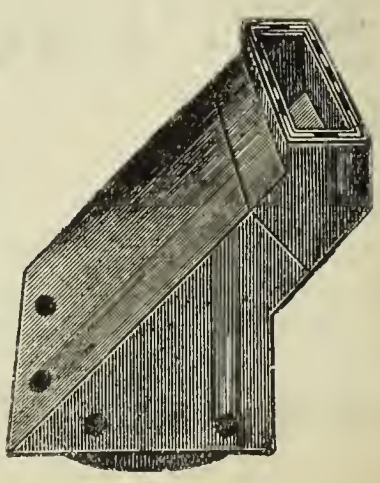
Absolutely Fire Proof.

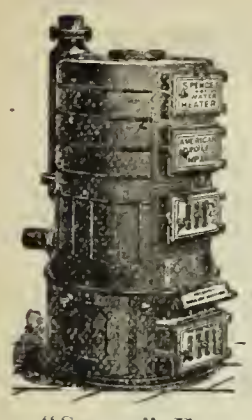
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER,

18 Wood Street, Pittsburgh, Pa.





"Spence" Hot Water Heater.

WE EMPLOY nearly 1000 people in our various departments—all of them experts in their respective branches of work.

WE MANUFACTURE 18 styles and 182 sizes of Steam and Hot Water Heaters. They are constructed of the best materials obtainable.

WE SELL to the dealer only! It has always been an inviolable rule of this company not to sell to the consumer!

American Boiler Company

94 Centre St., New York. 84 Lake St., Chicago.

THAT'S WHAT THEY SAID—

"Cold snap? We hadn't noticed it particularly—kept warm enough at our house."

THEY WERE USERS OF THE

"Mowry-Page" Boiler,

This well satisfied lot of people. Many fitters were fortunate enough to have them among their customers—were **YOU?** Our new agency list is open for '95–'96: shall we put your name at the head of it? Experience must have shown you that it pays to please your trade, and we can help you do it.

Better have our catalogue by you anyway—it's a good investment and costs you nothing.

W. C. MOWRY, Lock Box 314, Norwich, Ct.

ORIGINAL

"BEAUTY OIL STOVES."

Central Draft, Double Roller Burners.

TROY OIL STOVE CO., - - Troy, N. Y.

AGENTS: Reeves & Smiley, Philadelphia, Pa. C. T. Corly, Brooklyn, N. Y.

The Packard Enameling Co.,



400 NORTH AVE.,
Warren, O.
—MANUFACTURERS OF—



Plain, Stained and Enameled Handles, Knobs and Pail Woods.

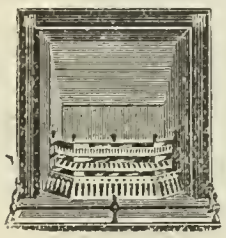
WRITE US FOR CATALOGUE AND PRICES. OUR WORK EXCELS.

THE WILLIAMS PRINTING CO.,

Commercial Printers AND Binders.

ESTIMATES FURNISHED FOR ALL CLASSES OF WORK.

96, 98, 100 and 102 READE STREET, - NEW YORK.



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.



— A BUMP FOR LOCALITY.—A small boy from Lansing was in Detroit not long ago with his mother, for the first time. It was also her first visit to the city, and she was almost as much interested in the sights and as confused by the bigness as the boy was. They had been out with the head of the family and had returned to their hotel, and the boy was looking out of the window with unabated delight.

"Say, mamma," he said after some time, "if I should go down this street seven squares and up the next one three squares and out the next one six squares, then go ahead five squares, where would I be?"

"Really, Frank," she replied, "it's more than I can tell you. You'd better ask your father."

"I don't have to," said the boy proudly. "I know."

"Oh, I guess you don't," she smiled.

"But I know I do," he persisted.

She was a little curious to learn if the boy had picked up any idea of the city, and so she humored him.

"Where would you be?" she inquired.

"I'd be lost," and she believed him thoroughly.—*Detroit Free Press.*

— HE COULDN'T, REALLY.—Sam: "Let me have a twenty for a week, can't you, old fellow?"

Robert: "Why don't you raise it on that diamond ring?"

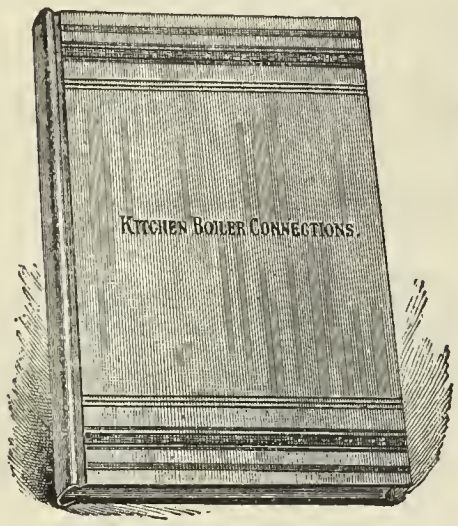
Sam: "Well, you see, it was presented to me by my dead wife, and I wouldn't like to give it up."

Robert: "Same here; my money was presented to me by my dead father, and I don't like to give it up, either."

— "YES, young ladies," said the professor, "Pallas Athene, the Grecian goddess of wisdom, was unmarried." And from that day the goose wondered why those girls wouldn't study.—*New York Recorder.*

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER.

71 Illustrations, 8vo, 140 Pages, Cloth

Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

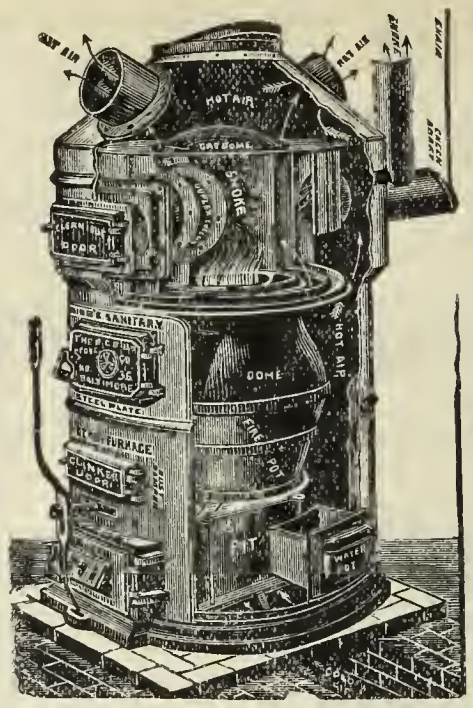
Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome —*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

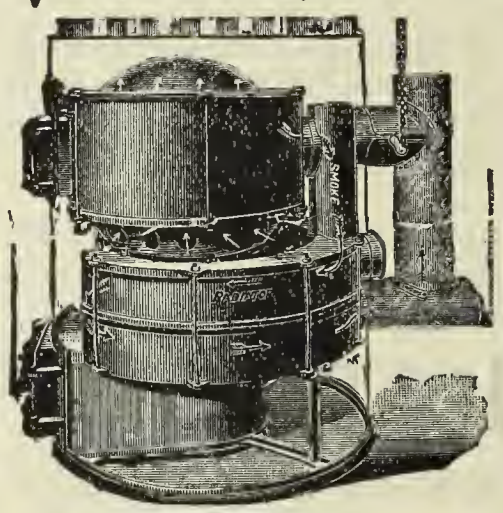
Baltimore Fire Place Heaters,

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.

DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

IT IS A GREAT ECONOMIZER OF FUEL.

IT IS A LOW FURNACE.

FALL BROOK COAL COMPANY,
Office of the Chief Dispatcher,

Corning Mfg. Co., CORNING, N. Y., Feb. 13, 1895.

GENTLEMEN: A year ago last fall I put in one of your No. 50 Victor Furnaces in place of one of another make which did not fully meet the requirements. Yours has proven satisfactory since in every respect, and the house has always been properly warmed. During the recent blizzard the Victor did its work without being forced, and kept us comfortable. No Furnace could be subjected to a more severe test than the weather imposed condition on mine from Feb. 7th to Feb. 12th.

Yours truly, J. W. LYNAHAN.

Agents wanted. Address

THE CORNING MANUFACTURING CO.,
Corning, N. Y.

DO NOT CUT THIS OUT,
FOR IT WILL APPEAR AGAIN

19,000 IN USE.

The Dunning Boilers

Are the Best

—FOR—

Steam or Hot Water Heating.

—o—

Send for Catalogue.



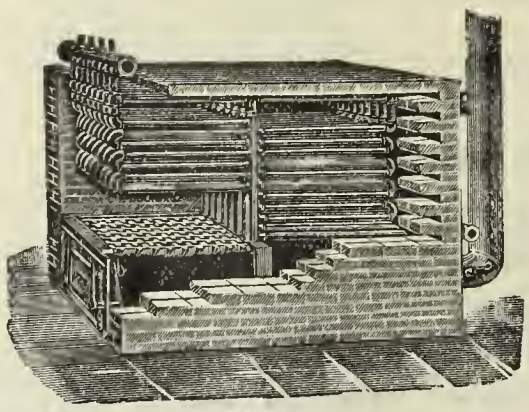
The Dunning Boilers

ARE MADE OF

Wrought Iron or Steel

AND HAVE NO

Packed Joints.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

Over 300 Different Sizes.

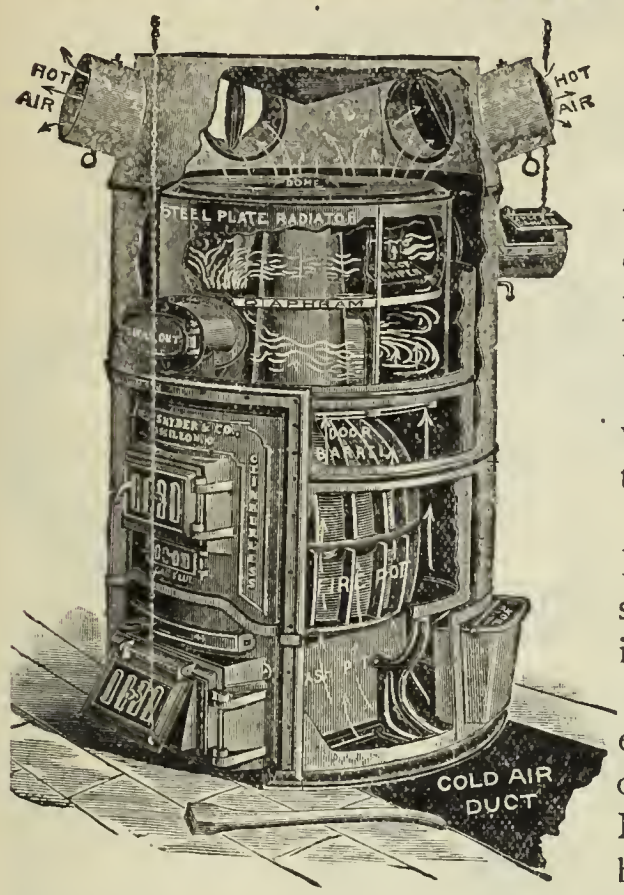
SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST., ROCHESTER, N. Y.

New York Office, 44 Dey Street.

A BOOMER and SURE DEATH.



THE BOOMER HOT AIR DRAFT is absolutely correct and will *burn* all the *Smoke* and *Gases.* The draft passes through a heated iron chute 1 in. high, 15 in. wide and 6 in. long to reach the fire.

Double Return Flue Radiator insures *Economy* and is easily cleaned.

Especially adapted for either *Soft* or *Hard Coal.* Makes fully one-half less ashes than any other furnace. All Soot is burned. *Heaviest, Most Durable* and *Economical* Furnace made. "Don't be a clam," but investigate and learn the *Real Merits* of the *Boomer* before you order Furnaces.

The No. 16 Novelty Spray Pump

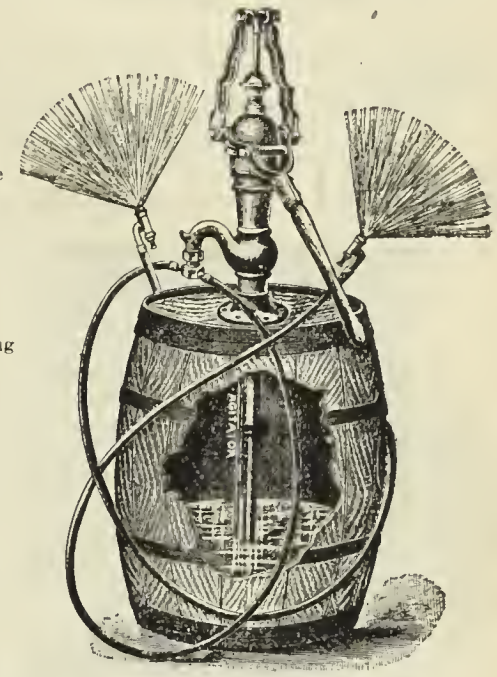
Is a Fatal Enemy to Bugs and Insects.

A perfectly steady stream is obtained, full 6½ inch stroke. Agitator pipe to bottom of tank insures constant stirring up of the solution being used. Life is too short to waste words selling a poor pump.

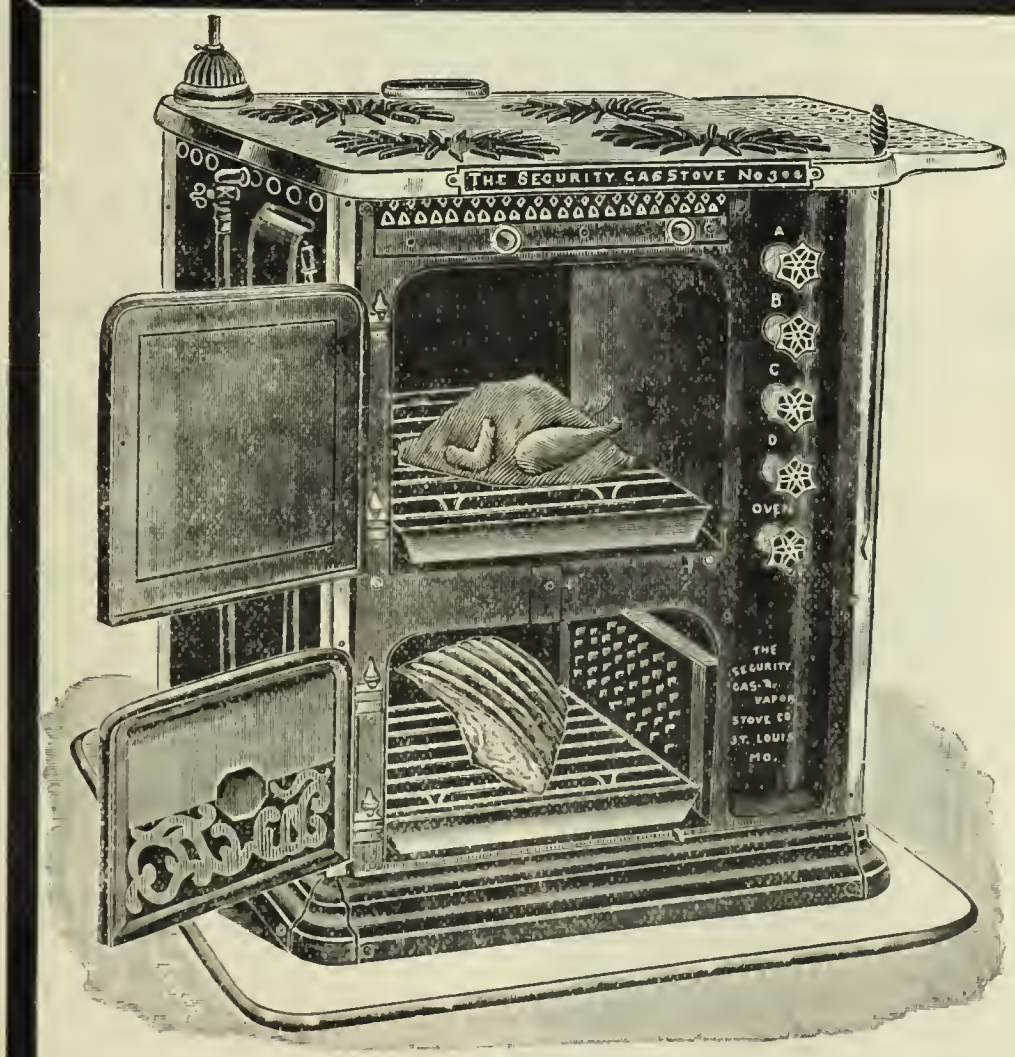
The Novelty will save you time and trouble and make a good profit for you.

The Only Perfect SPRAY PUMP Made.

Write for Complete Catalogue of its Many Merits and Illustrating Full Line of Other **Spray** and **Well Pumps.**



HESS, SNYDER & CO., Sole Makers, 73 ERIE ST., MASSILLON, O.



Patented June and July, 1894.

The Security Gas Range

with improvements up to date. Has double oven, which is guaranteed to do double the work of any ordinary oven at less cost. It is made for family use, and has proved wonderfully successful wherever introduced. It will cook, bake, roast, and is the only stove which will **barbecue a steak, and will also heat water quicker than any other gas stove on the market.** It is strongly built, neatly and tastily decorated, and will prove ornamental as well as useful.

Write at once and secure the agency. Also send for illustrated catalogue and price-list.

L. B JONES, 1803-5-7 Chouteau Ave., St. Louis.

Successor to Security Gas and Vapor Stove Co.

THE SHIRK REFRIGERATOR CO.,

CORK FILLED.

Manufacturers of

REFRIGERATORS

FOR

Families,

Hotels,

Restaurants

AND

Apartment Houses.



Builders of

Cold Storage Houses

AND

COOLING ROOMS

Of Every Description.

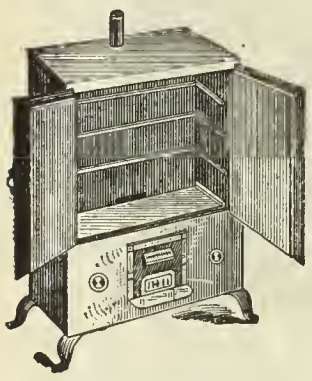
273 WABASH AVENUE,

CHICAGO.

Branches { 30 Warren Street, NEW YORK. / 905 Market Street, PHILADELPHIA.

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

BAKING BY

Perfect Circulation of Hot Air.

10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.

Burlington, Vt.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE

THE BEST IN THE WORLD!

OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

At LOWEST PRICES EVER KNOWN.

If your dealer does not have them, Send for Illustrated Circular and Price-List, to

JOS. W. WAYNE,

MANUFACTURER,

124 MAIN STREET, CINCINNATI, O.



Distributing Agencies for 1895.

The S. M. Howes Company, Boston, Mass.
Suppiee Hardware Co., Philadelphia, Pa.
Bindley Hardware Co., Pittsburgh, Pa.
Frank Diel, Syracuse, N. Y.
McIntosh-Huntington Co., Cleveland, O.
Indianapolis Stove Co., Indianapolis Ind.
Chicago Stove & Range Co., Chicago.
Freeman Delamater & Co., Detroit, Mich.
Robert Seeger, St. Paul, Minn.
A. J. Lindemann & Hoverson Co., Milwaukee, Wis.
King Hardware Co., Atlanta, Ga.
O. K. Stove & Range Co., Louisville, Ky.
Heckel Hardware Co., St. Louis, Mo.
Howard W. Peak, Fort Worth, Texas.
Richards & Conover Hardware Co., Kansas City, Mo.
Tolerton & Stetson Co., Sioux City, Iowa.
Rector & Wilhelmy Co., Omaha, Neb.
McDonald & Wilson, Toronto, Ont.

New York Office: 105 & 107 Hudson St., } LLEWELLYN BONHAM, Agt.

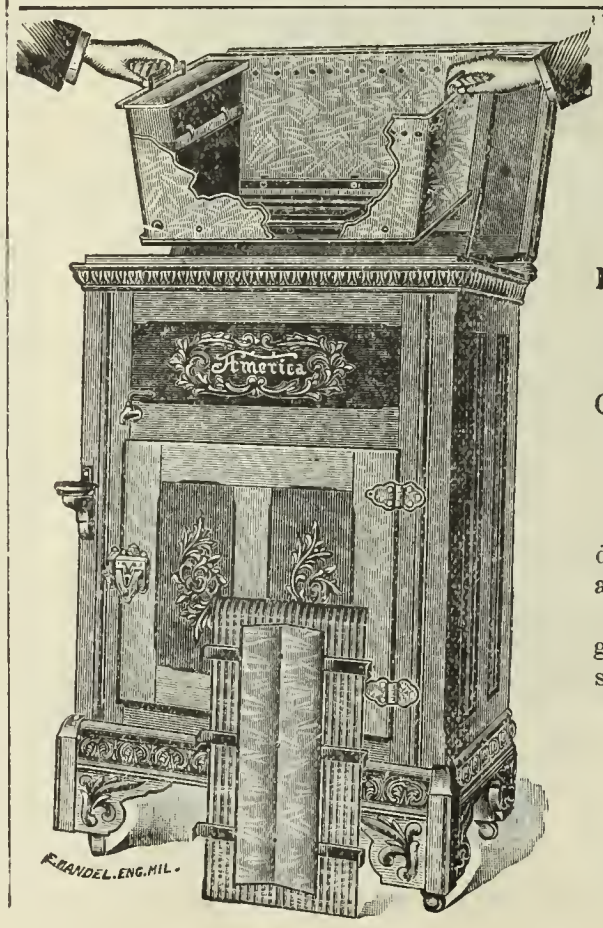
A dealer wanted in every town and city in United States and Canada

Write for catalogue, terms and discounts, and secure the agency.

Apply to nearest agency or address Home Office,

Gurney Refrigerator Co.,

Fond du Lac, Wis.



The America!

GEM OF

REFRIGERATORS.

Patented Removable Ice Compartment.

Can be kept clean with the least trouble.

Its construction for cleanliness, drainage of waste water, circulation and insulation is perfect.

Write for catalogue and investigate our claims. It will pay you to secure the agency in your town.

THE

Bowen Manufacturing Co.,

FOND DU LAC, WIS.

— A Good Beginning.—Miss Youngbride: "I have not the slightest idea how the wedding service begins. I'll have to look it up."

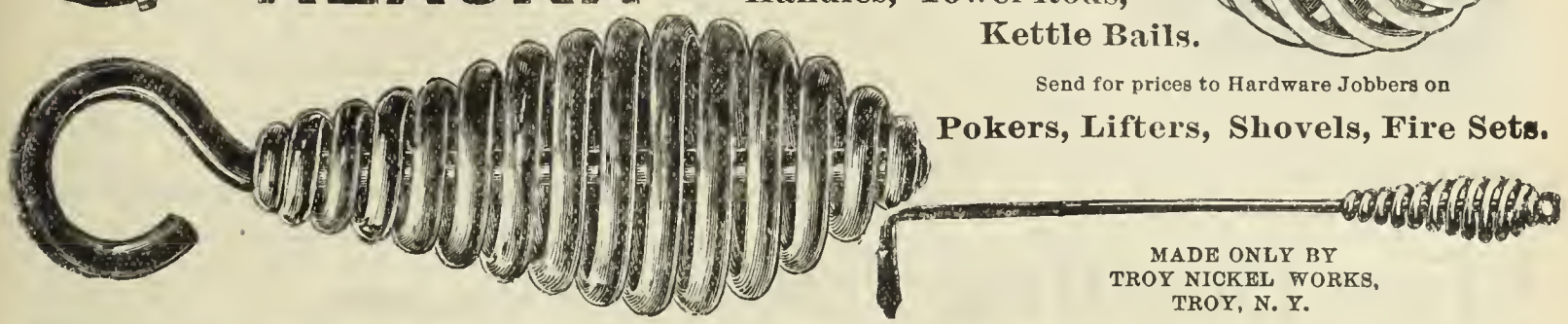
Her intended (glancing with admiration at the wedding gifts): "Why not start off, 'Know all men by these presents?'" —*Harlem Life.*



MADE UNDER THE GAITLEY PATENTS.



ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.



Send for prices to Hardware Jobbers on

Pokers, Lifters, Shovels, Fire Sets.

MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

TUTTLE & BAILEY MFG. CO.,

REGISTERS, VENTILATORS, &c.



REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.

MICA

NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

M I C A | MICA OF ALL GRADES —FOR— STOVES and Mechanical Purposes.

PALERMO MICA CO.,
Miners and Importers and Wholesale Dealers,
S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

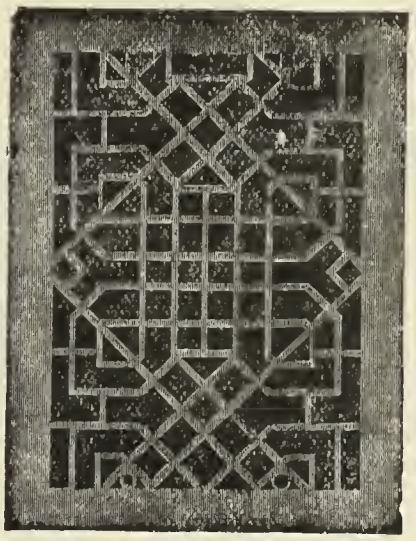
The Mica Mfg. Co.
JOHN O'NEILL, Prop.,
88 Fulton St. N. Y.

— Her Advice.—"I suppose," observed the tramp, bitterly, "you would like to have me get off the earth. But I cannot."

"Have you tried soft soap?" asked the woman in the blue gingham dress, dispassionately.—*Puck.*

— He Would Then.—Hazel: "I can't realize, old man, that you are a father."

Nutte: "Can't you? Come around and spend the night with me."



Warm-Air Registers, Ventilators Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers, Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.

NEW HAMPSHIRE

MICA

IS THE BEST.

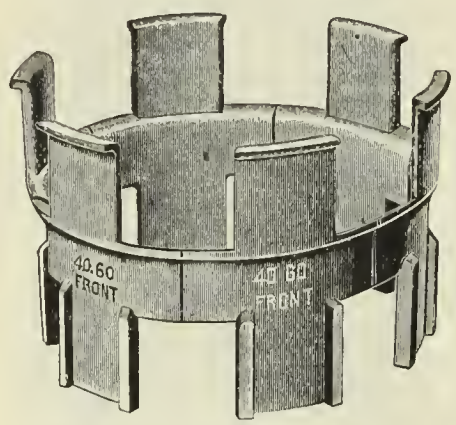
The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.

— Something Had Struck.—Uncle Allen Sparks picked himself up from the slippery sidewalk and rubbed the back of his head.

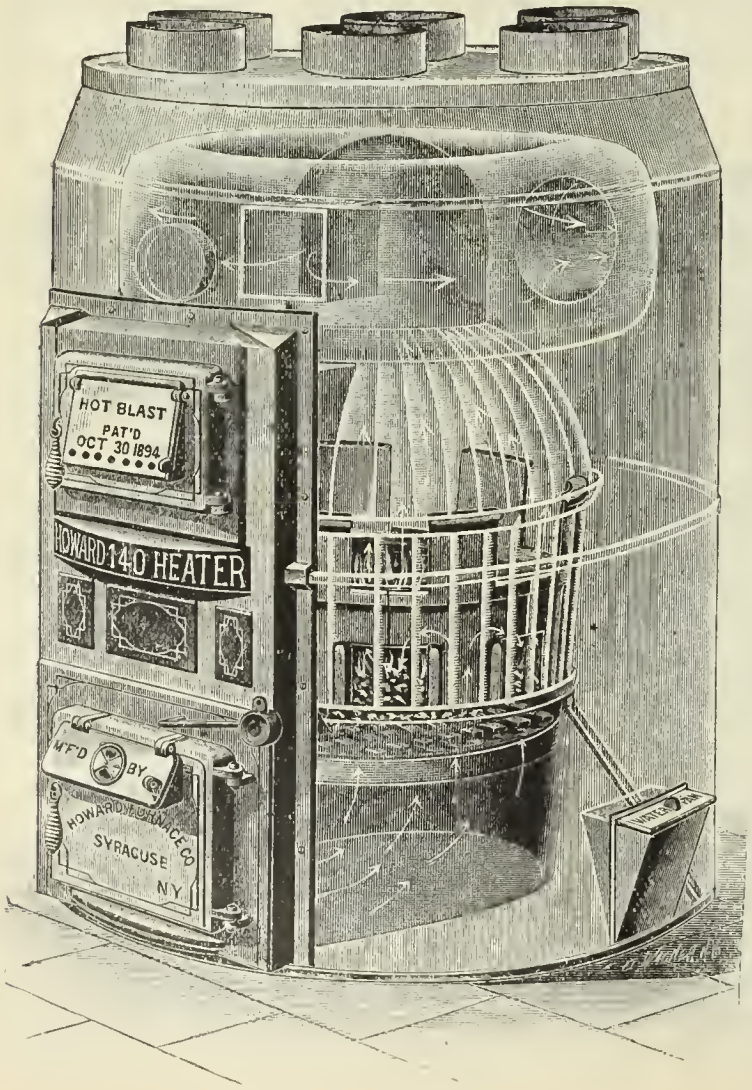
"When one sees stars on a cloudy night," he soliloquized, "it may be considered as something striking."—*Chicago Tribune.*

HOWARD FURNACES

For Burning Soft Coal



THE HOWARD HEATERS ARE PROVIDED WITH A HOT-AIR BLAST ATTACHMENT, WHICH DESERVES THE ATTENTION OF ALL DEALERS WHO WANT TO SELL A FIRST-CLASS FURNACE. . . . . .



SEND FOR CATALOGUE

AND SECURE AGENCY.

HOWARD FURNACE COMPANY,

MAIN OFFICE AND WORKS, } **Syracuse, N. Y.**

BRANCHES:

NEW YORK, 210 Water St. BOSTON, 61 & 63 Blackstone St. GRAND RAPIDS, 38 S. Division St. TORONTO, 337 Yonge St.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 23 1895.

DAVID WILLIAMS - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.. ....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 12.
Index to Reading Matter.....Page 58.

A Blow at Eight-Hour Laws.

The Supreme Court of Illinois has decided unanimously that the eight-hour law for women which was enacted in 1893 by the Legislature of that State is unconstitutional. The act expressly prohibits women from working in any manufacturing establishment more than eight hours in any one day. The court holds that a woman has the right to contract to work as many hours in a day or a week as she may see proper. The mere fact of sex does not justify the law making power to restrict the right of any person to dispose of her labor as she sees fit. But the decision goes further than this and lays down the broad principle that an act which abridges the freedom of contract between workman and employer in a lawful occupation is unconstitutional. In far-reaching results this decision is regarded as exceedingly important. It is stated to be the first decision in the United States against eight-hour laws, and thus presents a new obstacle in the path of the movement for shorter hours. Labor is held to be property and the laborer is declared to have the same right to sell his labor and to contract with reference thereto as has any other property owner. The declaration that a legislature is powerless under the State constitution (which conforms on this point to that of the United States) to interfere with the freedom of contract, strikes at all enactments which have been made for the purpose of shortening the hours of labor. It therefore blasts the hopes of those labor reformers who seek to bring about a new order of things through legislation. They will have to work in another direction. Much progress has been made in the creation of a strong public sentiment in favor of shorter hours of labor, and the movement seems destined to continue to grow in strength. But the short cut through an act of legislature has been clearly shown by this decision not to be feasible.

Displacing Planished Iron for Locomotive Jackets.

The economies forced upon railroad companies by their reduced earnings are leading to some remarkable changes. One of these is the substitution of cheaper sheet iron for the planished iron used as locomotive jackets from time immemorial. The cheap sheet iron is either japanned or painted. Not only is an important saving thus effected in the first cost of the jacket, but its subsequent care is much less expensive. Planished iron requires constant attention, being frequently oiled and rubbed, taking much of the fireman's time. The japanned or painted jacket falls to the care of the wipers or hostlers in the round houses. Numerous Western railroad companies have made the change on freight engines, and some very prominent systems are now extending it to their passenger locomotives. A heavy burden was taken from firemen's shoulders when the extensive use of brass ornamentation on locomotives was abandoned, and this later step is in the same line, but the prime consideration is not the diminution of firemen's labors, but economy in the cost of maintenance. An important outlet for the production of planished sheet iron is thus being seriously curtailed.

Nikola Tesla's Misfortune.

There is something singularly regrettable, and even pathetic, about the misfortune that has recently overtaken Nikola Tesla, the electrician, in the destruction by fire of all the mechanical instruments and scientific apparatus in his experimental laboratory, which it had taken him nearly half his lifetime to perfect. It is a loss which cannot be estimated in dollars and cents, and one, moreover, which will be felt in a measure by the entire scientific world, in which Tesla holds so high a place. The wiping out at one sweep of the work of years is a blow which must naturally strain the fortitude of a man to the breaking point. As parallel misfortunes two well-known historical incidents come to mind. The destruction by his pet dog of the sheets containing the result of precious calculations and investigations to which Sir Isaac Newton had devoted more than two years of labor, and the crushing loss which befell Thomas Carlyle in the burning by an ignorant maid servant of the manuscript of his "History of the French Revolution," lent by him to his friend, John Stuart Mill, are cases in point. Both losses were borne with the fortitude which characterized those great men. Newton set to work to travel afresh over the old ground, and regained all he had lost, and more, in the pursuit. The later-born philosopher rewrote his famous history from memory, and declared at the end that it was vastly superior to the original. So the result may be in the case of Tesla.

The Work of Reconstruction.

Nikola Tesla has youth in his favor and is credited with the possession of a full share of the qualities of grit and persistence which are inseparable from the best kind of genius. He has, too, the advantage of beginning over again with a full knowledge of all his previous steps and processes. Provided health and life are spared, we can, therefore, look to him with confidence for much more wonderful work in the field of electrical research which he has made his own. The loss of time which will inevitably occur before the special instruments necessary to his work can be replaced, and the results of former experiments be recovered, is, however, to be regarded as a calamity, coming just at a time when Tesla was apparently so near perfecting his discovery of the means of transmitting electricity without a wire, not to mention the other important investigations on which he is engaged. He commands universal sympathy in his present misfortune, and this alone should prove a stimulus in the arduous work of reconstruction which now lies before him.

The subject of the removal of New York City's garbage is still an open question. Notwithstanding the investigations of the special commission sent out last year by Mayor Gilroy for the purpose of determining the best systems followed in other cities, the adoption of a plan which will be entirely effective under the conditions existing in New York seems to be as difficult of solution as ever. At any rate, nothing definite has yet been done in the matter. The outrageous practice of dumping the city's refuse into the sea, which was strongly condemned in the report rendered by the special commission, is still being continued.

Plans have been filed with the Board of Port Wardens, in Philadelphia, by the American Sugar Refining Company for an iron pier 548 feet in length by 75 feet in width, to be built on the Delaware River front, to take the place of three old piers now existing between South and Bainbridge streets. This will be by far the finest pier on the river.

The Brosnan Molding Machine.

In this molding machine provision is made for drawing the pattern by cam motion. A simple operation by hand or power communicates a partial revolution which raises the pattern, and after the sand is applied and compressed, a proper motion of the cam shaft in the opposite direction draws the pattern down from the stripping plate. A positive stop arrests the revolution at the right point when the pattern is up. The arrangement holds the pattern plate alternately at the respective ends of its motion first with the pattern up and then with it down without requiring any fastenings.

The frame A is provided with vertical ways or guides A′, which receive long, straight parallel arms B′, rigidly bolted to and extending down from a rising and sinking table or pattern plate, B, on which the pattern M is secured. A small pinion, C, is mounted on a fixed stud, A^2, supported on the framing A, and by means of a light fly wheel, C′, and a crank handle, C^2, is turned at will in either direction. The cam shaft D carries the eccentric cams D′ D′ of equal size and similarly set on the shaft. A large gear, D^2, on one end of this shaft is engaged by the pinion C. In the adjustable and exchangeable stripping plate E engage T-headed screws E′, which extend downward through holes in the frame. They are stiffly set by means of the nuts E^3, E^4.

The under face of the pattern plate B presents nicely finished surfaces adapted to receive the action of the eccentric cams D′. By giving the crank C^2 a few strong turns in one direction, the cam shaft is partially revolved, and the pattern plate B is raised to the required position, protruding the pattern M to the required extent through the carefully executed aperture in the stripping plate, and by means of the long straight guide arms B′ held firmly against tilting. The flask, not shown, is applied and the sand introduced, rammed and struck, by hand or by machinery, in any ordinary or suitable manner. Now the operator turns the crank C^2 a few revolutions in the opposite direction, with the effect to lower the pattern plate and its attachments, including the pattern M. The eccentric form of the cam and the fact that the crank C^2 is started from a state of rest insure that the descending motion of the pattern shall be slow at the commencement. The guides or vertical ways A′ steady the movement, so that there is no trembling or irregularity laterally, and the pattern is drawn smoothly out of the sand, the first part of the motion being slow and the later portion of the descending movement rapid. A projection, D^3, is cast in the required position on one side of each cam.

The stops B^2 are fixed in the required positions on the under face of the pattern plate B. When the cam shaft has been sufficiently rotated to bring the cams into their highest position the projections D^3 strike the stops B^2 and insure that the motion is arrested at that point.

A grooved pulley, D^4, is keyed on the end of the shaft D, and carries a chain, G, by which a sufficiently heavy weight, H, is suspended. The force thus received tends to turn the cam shaft in the direction to lift the pattern plate and its attachments. The weight of H should be less than is required to balance the load when the eccentric cams are at their mid hight, but it is more than sufficient to lift the load when the cams are quite up. The arrangement offers little friction, and allows the attendant to turn the crank with ease alternately in opposite directions, as required, and insures that the pattern plate shall be held reliably without other fastening at the two ends of its motion respectively. When it is up it will be held up by reason of the fact that the eccentric cams are on their centers, and the gravity of the counterbalance weight is of full effect, and when it is down it will remain down by reason of the fact that the counterbalance weight is not sufficient to overcome the gravity of the plate and its attachments in addition to the friction when the parts are in that position. This machine is the design of M. J. Brosnan of 518 Henry street, Brooklyn, N. Y.

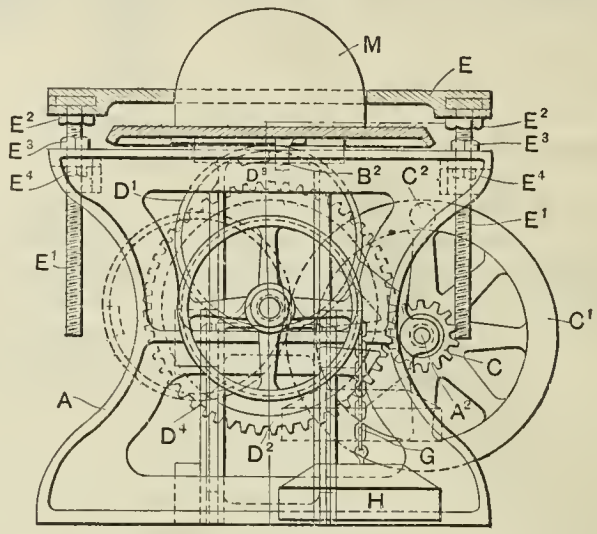


Fig. 1.—Sectional End Elevation.

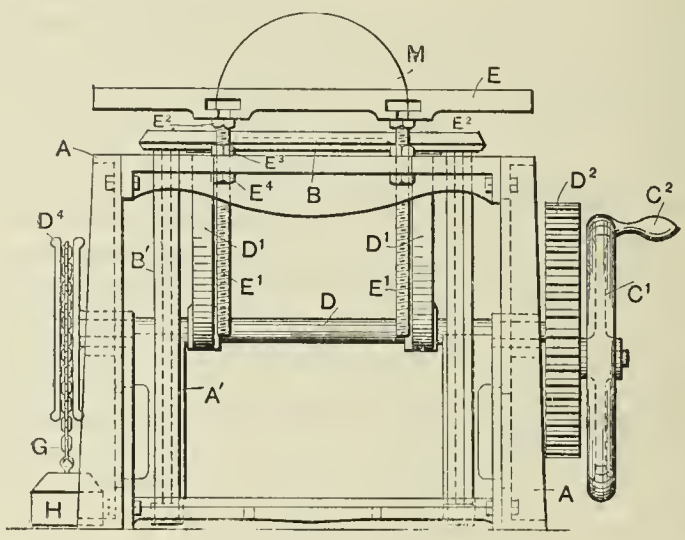


Fig. 2.—Side Elevation.

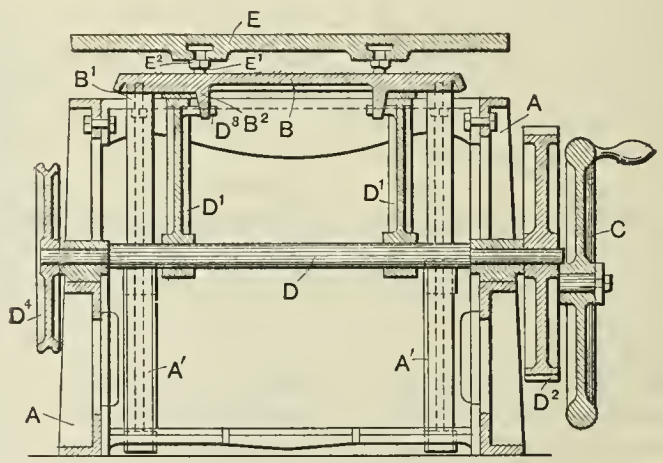


Fig. 3.—Machine with Patterns Removed.

THE BROSNAN MOLDING MACHINE.

The American makers of oilcloth are about combining because of increased competition and the reduction of tariff duty. A corporation having a capital stock of over $3,000,000 is being formed for this purpose.

The promoters of the proposed tunnel under the channel between England and France have announced their abandonment of the project owing to the opposition of the Government and the military authorities of Great Britain.

The Richards Molding Machines.

We here illustrate two forms of molding machines designed by Willard F. Richards of Buffalo, N. Y. Mr. Richards furnished the designs from which were built the four large molding machines now successfully in operation at the works of the Westinghouse Air Brake Company, Pittsburgh. Two of these machines turn out 265 complete molds per day, doing the work of 26 molders. The machine shown in Figs. 1 and 2 contains an abutment or stationary ramming block, a table for the flask to be rammed, arranged underneath the block, and a follower whereby the flask is moved toward the block for ramming. Projecting from the base A of the machine are two standards, A^1 A^2, connected at their upper ends by a cross piece, A^3. The horizontal flask supporting table B turns on the standard A^1, and consists of four upright rectangular casings, B^1, as shown in Fig. 2. These casings are carried by a central hub, as sleeve B^2, journaled on a fixed column, C, which surrounds the standard. The hub is supported on the base by a ball bearing, *d*. A horizontal follower, E, is arranged to move vertically in each chamber, B^1, and is provided on its under side with an actuating rod, *e*. Each chamber is open at its upper end, and formed in its lower end with an opening for the passage of the follower rod. The follower of each chamber is guided on upright rails *g*, arranged in the corners of the chamber and fitting into angular guides *g'*. Open rectangular plates H rest upon pins *h*, projecting above the upper edges of the chambers, and *i* are the usual stripping plates. The pattern J is secured to the upper side of the follower, and the half-flask K rests upon the stripping plate *i*.

The stationary ramming block L is secure to the under side of the cross piece d^3. Below the table B is the upright actuating cylinder M, the piston rod *m'* passing through the stuffing box of the cylinder and having its upper end located in the circular path of travel of the rods of the several followers E. The upward movement of the piston rod can thus be imparted to the follower rod standing above it. The piston is operated by steam or compressed air admitted through the pipe *n*. Each follower is provided with a pair of bell crank levers, *o*, for retarding its descent in withdrawing the pattern from the mold. These levers are mounted on horizontal pivots secured to a fixed upright plate arranged within the chamber of the follower. The upper arms of these levers bear loosely against the under side of the follower and are provided at their ends with bearing rollers for reducing the friction. The lower vertical arms of the levers are connected by links *q* with a cross head, Q, which moves in radial guides q^2 arranged within the chamber below the follower. The radial slides R are arranged between the guides q^2 and bear loosely with their rear ends against the inner ends of radial adjusting screws or bolts q^3 arranged in the cross head Q, so that the movement of the slide is imparted to the cross head, and *vice versa*. The inner ends of the several slides pass through openings formed in the adjacent walls of the chambers B^1 and are provided with anti-friction rollers *r* which bear against the face of a stationary horizontal cam, S, secured to the column C, the adjacent portion of the hub of the rotary table being recessed or cut away to clear this cam. The slides R are each provided with a longitudinal slot, *r'*, for the passage of the follower rods.

The wide, concentric portion of the cam S is made of such a radius that when a slide bears against such wide portion the slide is in its outermost position, and the upper arms of the bell crank levers connected with the slide stand in a substantially horizontal position, so as to support the follower resting thereon in the normal position shown in Fig. 1. The narrow portion of the cam is made of such a radius that when a slide rides over the same it is allowed to move inwardly under the weight of the follower exerted on the slide through the bell crank levers and the cross head Q, thereby permitting the follower to descend sufficiently to withdraw the pattern from the mold. The narrow portion of the cam is preferably arranged toward the rear side of the machine, as shown, so that the followers are allowed to descend to the position for stripping the pattern on that side of the machine only.

The rotary table is locked in place, after bringing one of the followers under the ramming block. A spring catch operated by a treadle, T, is employed for this purpose.

In the operation of the machine, when the rotary table is turned so that one of the followers E stands under the ramming block, the slide R co-operating with that follower is in its outermost position and the follower is sustained in the position shown in Fig. 1, being nearly flush with the upper edge of its chamber. The pattern secured to the follower projects through the opening in the stripping plate and the supporting plate of the latter, and the half flask rests upon the stripping plate, having been previously filled with sand in the usual manner. Upon admitting steam to the actuating cylinder the piston in the latter rises and strikes the lower end of the follower rod, moving the

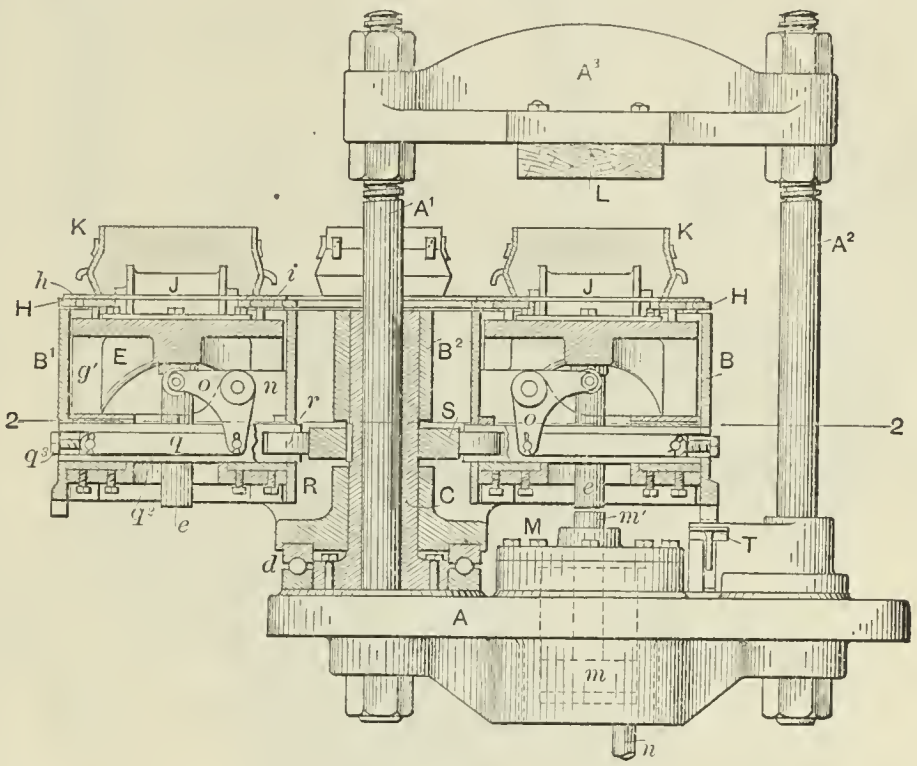


Fig. 1.—Sectional Elevation.

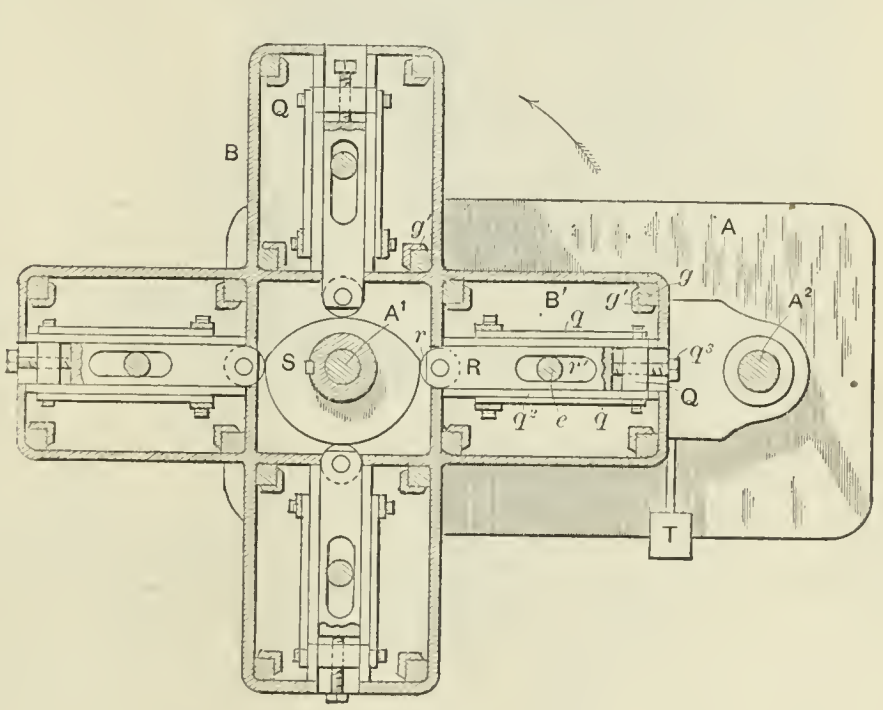


Fig. 2.—Sectional Plan on Line 2 2 of Fig. 1.

THE RICHARDS MOLDING MACHINES.

follower, together with the superposed supporting frame, the stripping plate and the flask, toward the ramming block, thereby forcing the sand in the flask against the ramming block and packing it around the pattern. Upon now allowing the steam to exhaust from the actuating cylinder, the follower with the superposed parts descends to the position shown in Fig. 1, when its further descent is prevented by the upper arms of the elbow levers *o*. In this position of the parts the frame which supports the stripping plate and half flask rests upon the pins *h*. The rotary table is now unlocked and given a quarter turn in the direction of the arrow in Fig. 2, so as to bring the partially lowered follower on the rear side of the machine and the next follower under the ramming block. This quarter turn of the table brings the slide of the follower opposite the narrow portion of the cam S, allowing the latter to move inward and the follower with the pattern attached thereto to descend to its lowermost position, thereby withdrawing the pattern from the flask and completing the half mold. The depressed follower remains in this position until the rotary table is again shifted for presenting another unrammed flask to the ramming block, when it is again raised to its normal position by its slide riding over the wide portion of the cam S and swinging the bell crank levers into the position shown in Fig. 1. The flasks on the several followers are in this manner successively presented to the ramming block and rammed, and are then moved aside for withdrawing the pattern from the mold.

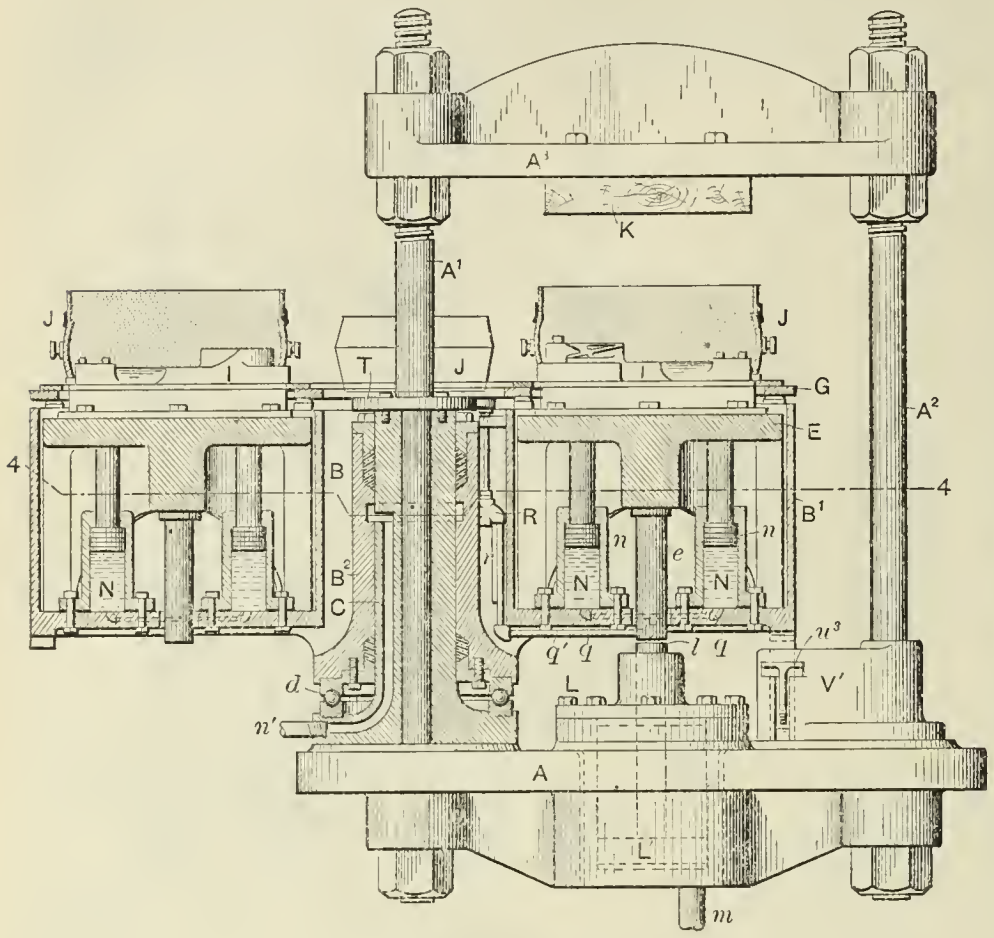


Fig. 3.—Sectional Elevation.

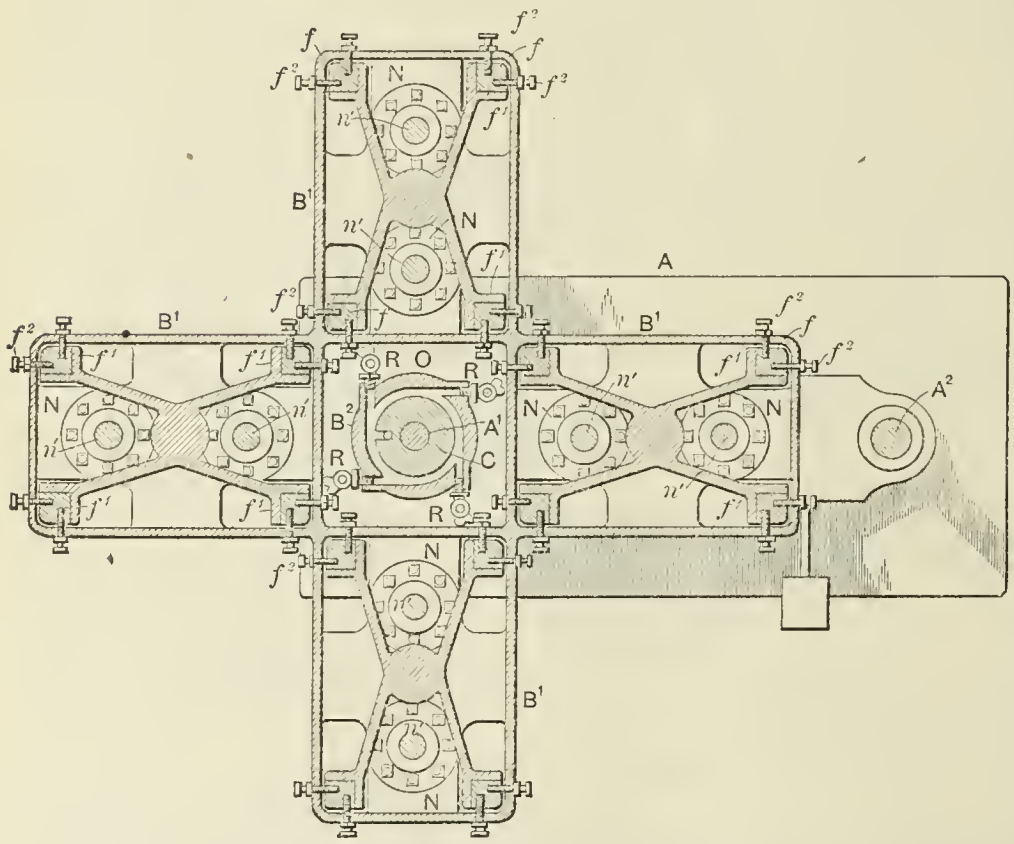


Fig. 4.—Sectional Plan on Line 4 4 of Fig. 3.

THE RICHARDS MOLDING MACHINES.

The machine shown in Figs. 3 and 4 is similar in its general arrangement to the one just described. In each of the chambers B^1 is placed a follower, E, whose rod *e* is actuated by the piston rod *l* of the cylinder L. The follower of each chamber is guided on upright rails *f*, Fig. 4, placed in the corners of the chamber and fitting into the angular guides f^1. The rails are adjustable by means of the bolts f^3. The supporting plates G rest upon pins *g*, and the stripping plates are secured to the upper side of the supporting plates. The arrangement of the pattern I, the half flask J and the stationary ramming block K will be understood from the drawings, as will also the method of supporting the platforms so they may be turned around the standard A^1. In each of the chambers B^1 are arranged a pair of upright hydraulic cylinders, N N, for retarding the descent of the follower after ramming the sand in the flask. These cylinders are located on opposite sides of the follower rod and in each cylinder is arranged a piston, *n*, the rod *n′* of which extends through the upper head of the cylinder, and is adapted to bear loosely with its upper end against the under side of the follower, so as to resist the downward movement of the latter, but permit it to move upward out of contact with the rods of the plungers. Formed in the hub of the rotary table B is an annular inlet chamber, O, with which the supply passage formed in the column C communicates. The lower end of this passage is connected with the pipe *n′*.

Each hydraulic cylinder is provided at its lower end with a combined induction and eduction pipe, *q*, and the pipes of the two cylinders of the same chamber communicate with a main pipe, *q′*, which is connected with the annular inlet chamber O. Each of the main pipes *q′* is provided with a three-way valve, R, for controlling the passage of the water to and from the hydraulic cylinders. To each of these three-way cocks is connected an outlet or waste pipe, *r*. The ways of each cock are so arranged that upon turning its plug in one direction the main pipe *q′* is placed in communication with the annular inlet chamber O and the waste pipe *r* is closed, while upon turning the plug in the opposite direction communication is established between the main pipe and the waste pipe and cut off between the main pipe and the inlet chamber.

The stop cocks are automatically controlled by the stationary cam T fixed to the standard A^1.

The smallest radius of the cam is arranged toward the rear side of the machine, so that when the arm of a stop cock rides over such narrow portion of the cam, it is caused to move inward under the pressure of its spring and turn the plug of such stop cock in the proper direction to place the cor-

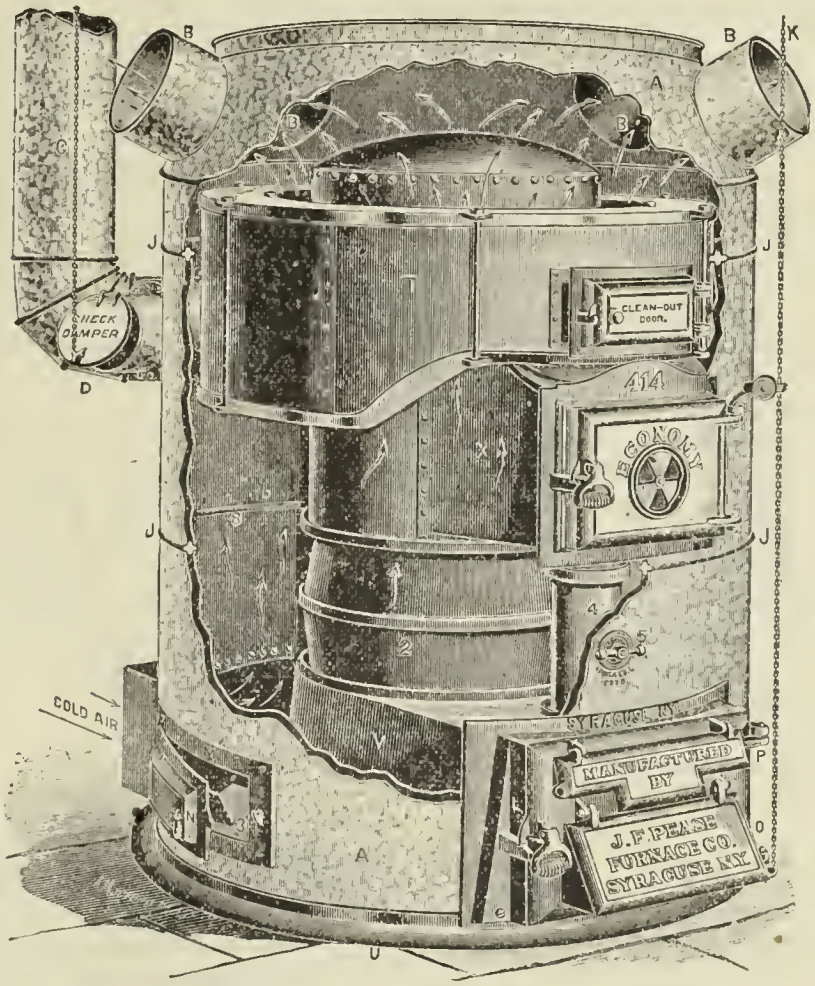
responding hydraulic cylinders in communication with the waste pipe *r* of the cock, thereby allowing the water to escape from the cylinders and permitting their plungers and the follower and superposed parts to descend by gravity. The portions of the cam, which face the front and sides of the machine are concentric with the axis of the rotary table, and their radius is sufficiently large to retain the actuating arms of the opposing stop cocks in the proper position to cut off communication between the waste pipes of such cocks and the corresponding hydraulic cylinders, and establish communication between the latter and the inlet chamber O. By this arrangement, only the stop cock of the chamber standing on the rear side of the machine is opened so as to allow the follower to descend, while the cocks of the remaining three chambers are kept closed, so as to prevent the descent of their followers.

When the rotary table is turned so that one of the followers E stands under the ramming block, the stop cock controlling the passage of the water to the hydraulic cylinders N of such follower allows the water to enter the cylinders, and the plungers of the latter are therefore raised and caused to support the follower in the position shown in Fig. 3. In this position the follower is nearly flush with the upper edge of its chamber, the pattern secured thereto projects through the opening in the stripping plate and the supporting frame G of the latter, and the half flask rests upon the stripping plate, the flask having been previously filled with sand in the usual manner. Upon admitting steam to the actuating cylinder the piston in the latter rises, and, striking the lower end of the follower rod, moves the follower, together with the superposed supporting frame, the stripping plate, the pattern and the flask, toward the ramming block, thereby forcing the sand in the flask against the ramming block and compacting it around the pattern. Upon allowing the steam to exhaust from the actuating cylinder the follower, with the superposed parts, descends to the position shown in Fig. 1, when its further descent is arrested by the rods of the elevated plunger *n*. In this position of the parts, the frame which supports the stripping plate and half flask rests upon the pins of the chamber B. The table is now unlocked by depressing its foot lever u^3 and is given a quarter turn so as to bring the partially lowered follower on the rear side of the machine and the next follower under the ramming block. This quarter turn of the table causes the stop cock R of the first mentioned follower to be turned in the proper direction to allow the water to escape from the hydraulic cylinders of said follower, and the latter now descends slowly by gravity, thereby withdrawing the pattern from the half flask and completing the half mold. The depressed follower remains in this position until the rotary table is again shifted to bring another unrammed flask under the ramming block, when its stop cock is again opened by its actuating arm riding over the wide portion of the cam and the follower is raised to the position shown in Fig. 1 by the water entering its hydraulic cylinders N and elevating the plungers in the latter. The several followers are thus successively brought under the ramming block and raised for ramming the superposed flask.

The Secretary of the Interior has decided in favor of the Portage Lake & Lake Superior Ship Canal Company in a suit brought against them by Angus Smith and others to set aside the certifications of lands made over to the canal company by the State of Michigan as a grant in compensation for the construction of certain public works. The property affected amounts to 68,647 acres, and includes a tract of iron lands in the Gogebic range.

The 1895 Pattern Economy Furnace.

The accompanying illustration shows the 1895 Pattern Economy furnace, brought out by the J. F. Pease Furnace Company, Syracuse, N. Y. The casing is shown broken away, revealing the internal construction and illustrating the principal features of this new form of furnace. It is specially designed for use in low cellars and is constructed to burn either hard or soft coal or coke. The principles of construction and operation are similar to those of the other furnaces made by the firm, the casing, however, being 9 to 12 inches lower according to size, while the castings of the heater are made somewhat lighter, though the steel portions are kept full weight. The furnace is therefore not quite as heavy as the regular style and is sold at a lower price. The casing is provided with an inside lining of tin to prevent waste of heat. The sides of the steel combustion chamber T are constructed of No. 12 gauge plate, the head and top being of No. 10. The fire pot is made in two sections with cup joints, the combustion chamber resting in a cup joint on top of the second section. The dome is surrounded by a single steel plate radiator the sides of which are made from No. 18 steel. This is securely connected to the inclined top of the feed chute X by cementing the cup joint. The direct connection thus made, it is pointed out, prevents any escape of gas or smoke into the cellar when the door is opened. The bottom radiator is of ogee form, which reduces the friction in the air circulation and secures a larger circulation up between the radiator and chamber. The smoke pipe C is connected to the rear portion of the radiator directly opposite the entrance. The check damper D, located on the smoke pipe, is regulated by a chain which runs to any room from which it may be desired to control the furnace. The lift draft door O on the ash pit door L is likewise regulated. The McClave T grate, hollow bar revolving grate or anti-clinker grate can be used as desired. In describing the operation of this furnace the manufacturers point out that the products of combustion ascend into and fill the steel chamber T, and the smoke and gases pass through the opening at the top of the feed chute X, which is somewhat higher than the opening of the feed door, and circulate through the radiator, the products of combustion finally escaping through the smoke pipe C. It is mentioned that great care is exercised in the construction of the furnace to make it absolutely gas tight, while the escape of dust through the ash pit door when shaking the grate is prevented by the use of the patent dust pipe 4. When the damper 5 is turned the dust caused by shaking the grate is drawn up into the chamber by the draft. The radiator, it is said, can be very readily cleaned with a scraper which is sent for the purpose. It operates through the clean out door and the smoke pipe collar in the rear.



The 1895 Economy Furnace.

The Boyden Power Brake Company, Baltimore, Md., have decided to take an appeal from the decision rendered last week by Judge Morris in favor of the Westinghouse Air Brake Company, in the suit brought by them against the Boyden Company for alleged infringement of a patented air brake mechanism

THE LETTER BOX.

Elbow Pattern.

From C. C., *Livermore, Cal.*—I would like some information regarding how to put a square elbow together. I can describe the pattern in the usual manner, but when it comes to allowing for edges I cannot get it right. I only turn over the upper part of the lower piece, and that throws the elbow out of bevel.

Answer.—We think it is the usual custom with tinners when making elbows, as for stove pipe, to turn the large part of the elbow so the entire edge can be turned in, especially at the heel. The small part of the elbow has the edge turned out, so as to receive the outer edge. For small elbows, ss those made of tin, that are to be soldered, the throat part of the small end is usually turned out, and the heel part of the large end turned in. Just how the patterns should be described would depend perhaps on the method of working. If difficulty was experienced in putting the two parts together after the edges were properly turned, or the desired angle was not obtained, it might be well to describe the patterns so the large end would have a little more than the required bevel, and the small end a little less. When describing patterns of any kind it is usual to obtain the net patterns, and then make due allowances for edges outside of the boundary lines.

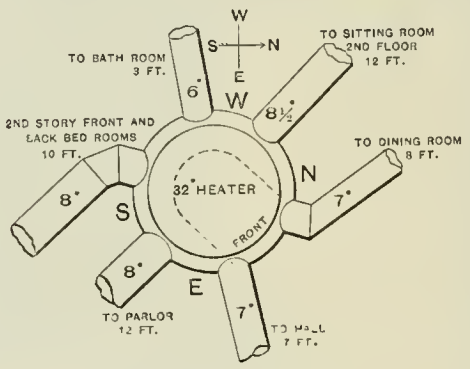
Allowance for Iron Pipe.

From C. C., *Livermore, Cal.*—Is there any set rule for each thickness of sheet metal in making round pipe? That is, how much to allow on the end the pipe goes in, or how much to take off on the end that goes in the pipe.

Answer.—There are general rules in use among tinners for making ordinary round pipe. Thus for No. 24 iron it is usual to allow $\frac{1}{4}$ inch, for No. 26 iron about $\frac{3}{16}$ inch, and for tin pipe say $\frac{1}{8}$ inch, depending on the thickness of the tin. Whether the allowance is to be given to the large end or taken from the small is a vexed question among tinners. When a crimping machine is used the two ends of the pipe are made the same size, the machine making the reduction. When making round pipe from heavy iron it is usual to allow three and a half times the thickness of the iron at each end, not counting for the lap. Thus supposing a certain pipe was to go inside of a flange, the iron would be marked three and a half times the thickness of the iron less than the circumference. If the inside of the small end of a pipe was to be made a certain diameter, three and a half times the thickness of the iron would be added to the circumference. That the large end of this pipe should allow another joint to enter, the large end should have added to it another three and a half times the thickness of the iron. Thus the large end of the pipe would measure in the flat seven times the thickness of the iron more than the small end.

Trouble With Furnace.

From TINSMITH, *Philadelphia.*—In reply to "Dealer," who reports trouble with furnace in *The Metal Worker* March 2. Having had 24 years' experience, I would suggest in the first place that the size of the pipes be reduced, as the furnace has not the capacity to fill them. 2. The pipes are too close together; they should be divided more evenly around the top of the furnace so that one cannot rob



Trouble with Furnace.

another. 3. Do away with the cold air duct and ventilate the cellar front and back. I submit the plan of a furnace job I completed a few weeks ago, during the cold snap, in one of a row of houses situated the same as the one in which my fellow mechanic is having trouble. All of my pipes are smaller and I have no cold air duct; all I do is to ventilate the cellar. I have tested the job to see what temperature I could raise, and the results were more than satisfactory. The average temperature on the first floor was 70°. By throwing one-half of the heat to the sitting room into the hall a temperature of 94° was shown in the hall outside of the sitting room door 8 feet away from the register. The house was a two-story seven-room residence and I used a first-class 32-inch furnace. I would like to hear if some of my fellow mechanics can do better than that with large heat pipes and cold air ducts.

Cement for Marble and Basins.

From H. F. H., *Boone, Iowa.*—In *The Metal Worker* of March 9 "E. S. N." inquires for a cement to fasten bowls to marble slabs. If he will use white lead and sand mixed as stiff as putty, he will find that it will stand all tests. He must be sure to have it stiff and well mixed, or the oil will soak through the slab if it is thin.

From CHICAGO.—I notice in *The Metal Worker* of March 9 an inquiry from "E. S. N.," Westminster, Md., who wishes a recipe for a good cement for joining marble and basins to marble slabs. The basins should be ground to fit the marble and then plaster of paris used as a cement. When properly applied it will not break or fall off.

Japanning Tin.

From J. H. R., *Munhall, Pa.*—For some time I have been unsuccessfully attempting to japan tin. Can *The Metal Worker*, through its columns, explain the proper method to be employed, as manner of applying, temperature for baking, &c. ?

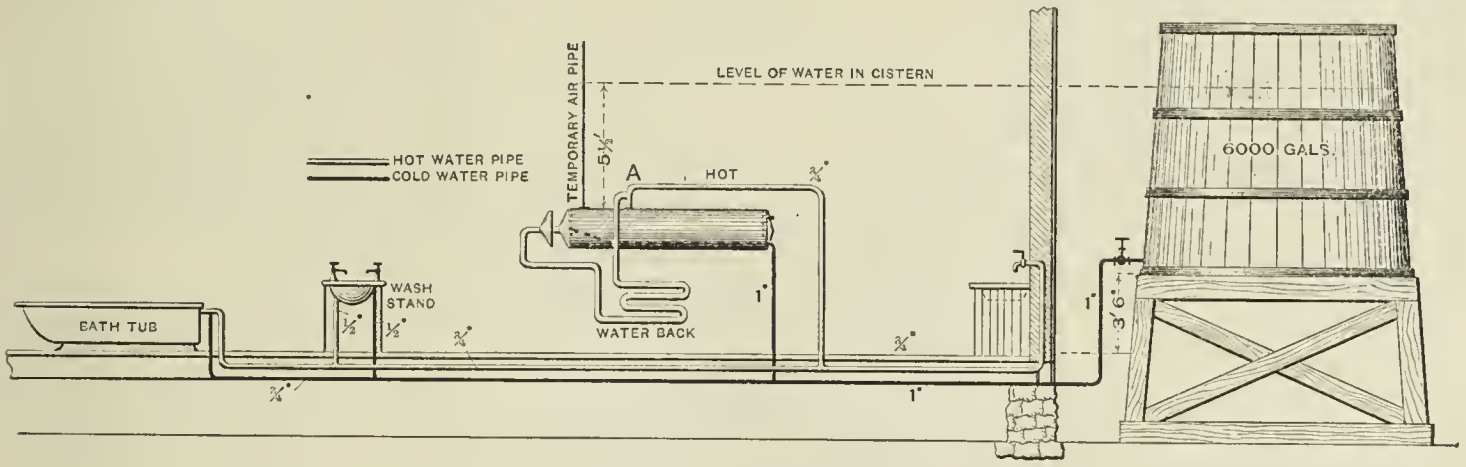
Answer.—The japanning of tin is an operation that requires considerable skill and experience, and if our correspondent has much of this work to do, it might be well to employ a regular japanner. For japanning by the means of heat, it is necessary to have a closed closet or oven, which is to be provided with a small stove or other heating device by means of which an even degree of temperature can be maintained for any desired time. The oven should be provided with a suitable door, and can be made of brick or galvanized iron, the walls being double, similar to the portable bake ovens. Provision should also be made for a steady draft of air through the oven for the purpose of removing the vapor from the drying japan. The oven should be kept free from dust or smoke, and be provided with proper shelves and hooks, so arranged as to be adapted to holding the various articles that are to be baked. Ovens of this sort are manufactured by the G. S. Blodgett Company, Burlington, Vt.

The japan is applied to the article by means of a flat varnish brush, and when applying the japan the strokes should have such a direction as to insure their being horizontal when the article is placed in the oven, thus preventing the formation of streaks. After the articles are covered with japan they are to be placed in the oven, which can be at a temperature of about 125° F., and gradually raised to 300°. As soft solder becomes weakened at 320°, soldered articles should not be heated over 300°. The articles are to be kept in the oven for five or six hours or longer, when the temperature of the oven is gradually reduced. Baking japans of various qualities and colors can be obtained from varnish manufacturers, as can also drying japans, that do not require to be baked. If it is not convenient to use an oven for baking a lacquer for tin can be made by reducing No. 1 furniture varnish with turpentine and coloring with

any of the transparent colors. A cheap brown japan varnish for tin can be made by reducing asphaltum varnish with turpentine, or rather by putting a little asphaltum varnish into turpentine, for so little of the varnish is required that it is liable to be made too thick, and thus give the tin the appearance of being painted. A thin varnish brush should be used for applying the liquid, and by experimenting on pieces of tin the required shade can be obtained. When the article to be covered with either thick or thin asphaltum is warmed, the varnish will dry quickly, and be quite hard and glossy.

Air Bound Service.

From E. M. P., *Brookhaven, Miss.*—I send a sketch of a range boiler and connections which I have recently put up and which does not work. I would be glad to receive some information as to the cause of the trouble; first, to stop the owner from visiting my shop three or four times a day and worrying me, and then, too, for my own satisfaction and enlightenment. The cistern is a large one, 10 feet high and 11 feet in diameter at the base, and holds 6000 or 7000 gallons. It has 4 feet of water in it, and the top of the water is 5½ feet above the boiler. The boiler is a patent self cleaning one holding 50 gallons. It has two openings in the side, two in the top and one in the bottom. I first set it upright on the floor and without the stand and connected it in the usual way, but it would not fill up. I concluded that there was not enough pressure from the cistern, as the water was only about a foot above the top of it, and then I connected it horizontally, as shown. I used the side opening near the center for the hot water return from the water back, and connected it direct with the pipe leading to the bathroom and kitchen sink. The boiler lies on a level with the water back. The hot water pipe between the stove and the boiler has three elbows in it, and the cold water pipe has only two turns in it. The openings in the boiler are all 1 inch, which I have reduced to ¾ inch. I use only one opening in the top end of boiler; the other I plugged. The cold water supply pipe is 1 inch until it enters the boiler, when it is reduced to ¾ inch. I have one main pipe under the house taking the cold water to bathroom and sinks from which I take the cold water supply for the boiler. Now, then, the trouble comes. The work is all done, and the cook is mad because I have turned the kitchen stove upside down, and the "man of the house" wants hot water to bathe. The trouble is this: There is plenty of hot water in the boiler, and the pipes under the house are full and hot, but it will not run out of the faucets. I forgot to say that my pipes all run down and under the floor and then up to the sinks and bathtub. There seems to be pressure everywhere except at the faucets. The cold water flows finely, but the hot seems to stop in the pipes just where they turn up through the floor to the faucets. Now I find that by opening up a union in the hot water pipe under the house there is plenty of pressure and boiling hot water. Thinking that the whole system needed air, I attached a piece of pipe temporarily to the unused opening on top of the boiler; but that did no good. I found, too, that when I gave the pipe air by unscrewing the union under the house the water ran some from the lowest faucet in the bathroom; but when the union was made tight again the flow of water stopped. The water is heated quickly and circulates well. There seems to be a lack of pressure somewhere. Please tell me where the trouble lies. I hope my description, explanation and drawing will enable you to see the cause of the trouble. Is it a lack of force from the cistern, or is it a want of air in the pipes? Is my construction of hot water pipe from coil to boiler right? Please let me hear from you through *The Metal Worker*.



Air Bound Service.

Answer.—The trouble is due to air collecting in the hot water pipe from the boiler where it turns down to supply the fixtures. If an automatic air valve is placed on this pipe at A or a pipe open at the top like that placed on the boiler, but run up high enough so that it will never overflow, the air can escape and the water will flow. If a pipe is used for an air vent, the end may be turned down after it has run up above the highest probable water level and the end carried to a sink so that an overflow could do no harm. A dip such as is shown is common in piping house service and only gives trouble when the water pressure is extremely low, as in this case, where, the head being about 5 feet, the pressure is but slightly over 2 pounds. All water contains more or less air, and in boiling the air is liberated to collect at some point unless it can escape. In this case it has collected in the service pipe and when heated it expands and the pressure is not sufficient to displace it. In drawing water from a hot water faucet the discharge often commences with an irregular stream interspersed with air puffs, when finally the water flows smoothly. This is because there is sufficient pressure to drive the air out ahead of or along with the first flow of water. On opening the union in the cellar a siphonic action was started which caused the flow of water. Water flows from the cold service because there are no air traps in it. The arrangement of the piping has no special defects, but for a 50-gallon boiler 1-inch pipes to and from the water back are better than ¾-inch pipes. It is better for the bottom or lowest part of any boiler to be higher than the highest part of the water back, even though many boilers are set differently.

Pattern for Conveyer.

From J. S. K., *St. Louis*—I would like to learn through *The Metal Worker* how to cut the pattern for the flange of a conveyer. I have a job at hand that requires a flange around an 8-inch pipe, the flange to be wide enough to fit tight into a 16-inch cylinder and must make a circuit every 30 inches, as shown in the sketch.

Note. This is a problem that has frequently been presented to us, but has never been answered in the way requested. As a matter of fact a pattern cannot be cut for the helix described by our correspondent. To make the form the metal has to be stretched. The usual way, we believe, is to cut the metal into split disks and then hammer them until they will take the proper pitch. Then by fastening a succession of disks together the conveyer is formed.

Stained Galvanized Iron.

From SUBSCRIBER, *New York*—Can some reader of *The Metal Worker* give the formula for restoring galvanized sheet iron from store or mildew defects?

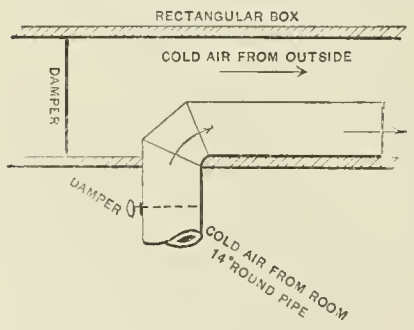
Note.—Galvanized iron is often discolored from dampness, and the appearance very closely resembles mildew, although, of course, it cannot properly be called mildew, which is a vegetable

growth. We think it is the custom in most shops to scour the discolored iron with a wire brush or something that would produce the same effect, and then use the iron in places where the discoloration is not objectionable owing to appearance. To restore the original appearance of the iron is impossible unless the sheets are regalvanized.

A Peculiar Furnace Experience.

From CHARLES N. ARNOLD, *Norwalk, Conn.*—If "C. S.," Cleveland, Ohio, who reports a peculiar furnace experience in *The Metal Worker* of March 9, will connect the exhaust pipe from the sitting room with the furnace pit, just under the edge of the bottom plate of the furnace, instead of running it into the furnace casing or chamber, it probably will work all right, provided that the slide in the cold air box is closed sufficiently far that the heater is compelled to receive a portion of its supply of cold air from that particular source rather than from the cold air box proper. Exhaust pipes of this description are often very erratic in operation, and not infrequently disappointing in results. In my judgment, the difficulty is largely a question of too great a supply of cold air for the number and size of hot air pipes in commission, which transforms this exhaust pipe into a service or hot air pipe. Neither of the methods proposed provides the best method of disposing of the cold air in the room. If "C. S." will send me his address I will endeavor to inform him how to construct a cold air relief or exhaust pipe that will properly ventilate the room.

From J. W. G., *Clinton, Ill.*—Referring to the communication from "C. S.," Cleveland, Ohio, in *The Metal Worker* March 9, I would suggest the following methods of meeting the difficulty. I have never met exactly this trouble in practice, but have had something similar. The cold air duct is of course made large enough to meet all the possible demands likely to be made upon it at any time. When only three

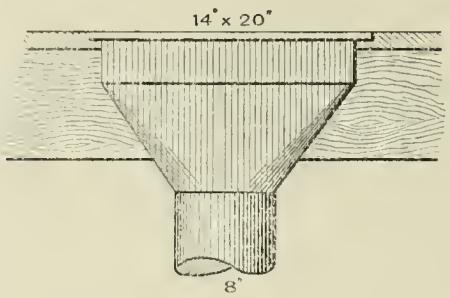


A Peculiar Furnace Experience.

or five pipes are used, as mentioned, the duct is of course larger than these pipes require. The cold air pipe should have a damper for use at such times, but we are not advised of any, nor do the sketches show one. It is likely that this was the condition when the inside cold air duct was added on the side of the furnace opposite the outside cold air duct. This latter having larger capacity than the hot air pipes in use would produce a slight pressure on windy days, which would be relieved by heated air coming from the register in question. I think a damper as mentioned above and properly set would prevent this trouble. I would also take the editor's suggestion and remove the length of pipe inside the furnace.

If the firm having this in charge do not care for expense I would recommend that they run pipe from the register in question direct to the nearest point of the outside duct and place an elbow and length of pipe just inside, the length of pipe pointing toward the furnace. Dampers should be placed in conspicuous places in both ducts. I think no difficulty would ever be found with this arrangement.

From S. J. P., *Pittsburgh.*—In answer to "C. S.," Cleveland, Ohio, on a peculiar furnace experience, in *The Metal Worker*, March 9, I would suggest that he reduce the exhaust pipe



A Peculiar Furnace Experience.

from 14-inch to about 8-inch, making his register box funnel shape or tapering from 14 x 20, which is the size of exhaust register, down to 8-inch or not over 9-inch, and then carry a pipe to the extreme bottom of heater, having an elbow turn up. Then put a damper in main cold air duct, if it hasn't one already; close the damper in main cold air duct until he finds the upward current drawing down the extra exhaust pipe and he will find it will work all right. The first mistake is the exhaust pipe is too large and the main cold air duct brings all the cold air the heater can take care of, consequently it won't draw on the extra one.

From EXPERIENCE, *New York.*—I had just such a peculiar furnace experience as that mentioned in *The Metal Worker* of March 9 some years ago. The room was exposed to the north and east. I ran the hot air pipe up to within 8 inches of the ceiling, and carried the cold air pipe from the floor to the furnace. Then everything worked like a charm. "C. S." can test this method easily by taking out the register and running a pipe that will fit tightly into the collar of the register box up near the ceiling. Then by having a good fire and the doors leading from the room closed, a few minutes will show him how he must vary the piping to suit the rooms to get the results he desires. There may be other circumstances connected with his case that hinder circulation, but ordinarily the method I have described will overcome the trouble. Furnace problems are very simple, consequently very elusive. If the cold air and hot air pipes are properly proportioned with the size of the furnace, air will flow in almost any direction. Madam Nature wants her laws obeyed and she can be coaxed to do most any thing, but always makes trouble when forced. She has always been very kind to me, and will be to any one who tries to please her.

Trouble With a Water Tank

From C. A. W., *Weissenburg, Pa* — About 18 months ago I was called upon to line a water tank which was used instead of a cistern. The tank was 7 feet long, 4 feet wide and 6 feet deep, and I used in it No. 26 galvanized iron. The tank itself is made of 2-inch planks thoroughly braced so it cannot expand. I considered it well made of wood, and put in the iron and soldered the seams as thoroughly as I could. The owner, however, soon reported that the tank was leaking, and when I came to find out the trouble I discovered that about one half of the side seams were cracked. I repaired it, but again it leaks. I find the bottom is all right. I would like to hear from readers of *The Metal Worker* if they have had similar experiences and how they overcame the trouble.

Finish for Slate Roofing on Ridge and Hip.

From SLATER, 772 *Columbia street, Hudson, N. Y.*—Replying to the inquiry of "M. A.," Suffolk, Va., that appeared in *The Metal Worker* of March 16, and noticing the explanation you have given him, would say that I think he will be obliged to look for an experienced, practical slater to teach him the trick of the trade; and if I can be of any service to him, I should like to have him write me. I would like to hear from "J. R. S.," West Fairview, Pa., who wants to know the best method of hanging gutters for slate roofs on high buildings without the use of ladders. The inquiry appeared in *The Metal Worker* of November 24, 1894.

Which Is Best for Furnace Tops?

From FOREMAN, *Newark, N. J.*—In answer to "J. C." in *The Metal Worker* March 2, in reference to the style of furnace top, my experience has been in favor of the cone top. Either style of top will not hinder the furnace from doing good work if there is an ample air chamber under it. If the radiator in the furnace reaches up into the top, leaving no space for a volume of air to collect, the hot air pipes are not likely to be well filled. I have known unsatisfactory furnaces made to do good work with no other change than an increase in the hight of the air chamber. If the radiator fills the furnace body or casing full, the air that passes up between may not be enough to fill the pipes, while if there was an air chamber for the inflowing air to cushion against, it would flow in faster and would expand to fill the air chamber, and then the pipes would be full. For instance, a 36 inch casing inclosing a radiator 30 inches in diameter would leave 3 inches of air space all around. The 36-inch casing would have an area of 1017 inches. The radiator would have an area of 706 inches, leaving an area in the 3 inch air space of 311 square inches. Now if the furnace was put up in a house with three 9 and four 8 inch pipes, with a cold air duct 12 x 24 inches, there would be trouble without an air chamber. The area of the pipes would be 389 inches, or 78 inches more than the air space, so that some of the pipes would surely feel the effect. The area of the cold air duct would be 288 inches, or almost equal to the air space before the air is expanded by being heated. It is generally conceded that the air would, in ordinary cold weather, expand one-third, when, if there was no

air chamber at the top to receive this increased bulk due to expansion, the air would be held in check and overheated. Then, when delivered to the pipes at a high temperature, it would cool and contract in the pipes, and there being no air chamber to supply the deficiency, some annoying behavior would follow. By all means have an air chamber at the top of the furnace whichever style of top is used, and the average furnaceman will find it advisable to use the cone top in low cellars, to get the air chamber and pitch for his pipes. He will be forced to use the flat top when a number of pipes run in one direction, and he will find that, used with judgment, both styles of tops will do good work if an ample air chamber is provided. With steel furnaces having solid domes not less than 12 inches should be used on a 36-inch furnace, and increased as the diameter of the furnace and the area of the pipe increase. Furnaces having a cast iron radiator of hollow circular style, supported by pipes which bring the gases to it, may work with less air chamber.

Water Hammer in Pipes.

From G. D. H., *New York*.—Answer to inquiries of "G. A. L.," Manchester, Vt., and "G. J. M.," Oshkosh, Wis., that appeared in the *Metal Worker* March 16. The sudden closing of fire hydrant will give a shock to every house water supply for many blocks around unless their water supply pipe systems are amply provided with air chambers. The intensity of the shock, or more properly the water hammer, depends upon the length and size of the main line of the water flow between the hydrant and the reservoir, the velocity of the water in the main being the measure of the intensity of the shock at the sudden closing of a hydrant, hence much greater trouble from this cause occurs in town water systems with small sized mains. Thus under the varying conditions of the spouting, volume, and the time of closing the valve of the hydrant, there are possibilities of any percussion pressure up to 400 or more pounds per square inch being brought to bear upon the main near the closing hydrant and the house pipes and hot water boilers in the neighborhood. The only safety in a water supply system is in using care and common sense in the handling of hydrants, and, in dwellings, to provide air chambers by extending the pipes a foot or more above each bibb in the house or as many as can be made convenient. As in "G. J. M's." trouble, if the plumbing construction does not allow of continuing the pipe for each sink or wash basin there should be an extension of both hot and cold water pipe at the bathtub and also at the kitchen sink. If the water is used above the kitchen, second or third floor, a branch pipe may be taken out of the water pipe near the floor and carried up under the sink for an air pipe on each story. Where the water is continually under pressure at the bibbs, the air finally becomes absorbed by the water, which will be known by the hammering in the pipes when bibbs are quickly closed. In order to recharge the air chambers, the water should be shut off in the cellar and the water in the pipes drawn off at the lowest bibb with the other bibbs open, when air will be drawn into the pipes and the air chambers will become charged with air. An air chamber in the cellar will only half remedy the water ram, as it will stop the impact on the street service pipe, but will not prevent it at the bibb that is closed suddenly. There is no necessity for making the air chamber other than with the pipe used for the house plumbing. Wherever a bibb is fastened on to a lead pipe the pipe can be continued up the wall or backboard for a foot or more as convenient. Ball cocks sometime stick. They should be left easy on the plug and the float be loaded to half immersion when free in the water; they will then pull down easy, or what is perhaps better use the compression valve and ball which is now almost universally used in our cities for flush tanks.

Method of Heating Water.

From E. M., *Omaha, Neb.*—In order that the great West shall be represented in the Letter Box, I will attempt to give "J. P.," Massachusetts, assistance with his water heating problem in *The Metal Worker* of February 16. Having set his boiler, the bottom of which should be above the heating coil for good circulation, it should be connected with the coil in the fire chamber of the steam heater, with a rise in the pipe from the top of the coil to the side connection in the boiler, and a fall in the pipe from the bottom of the boiler to the bottom of the coil. The coil has sufficient heating surface for a good size boiler, unless a great deal of hot water is drawn. The coil will expose about 14 square feet of heating surface, and having no data as to the capacity of such surface for heating water in a kitchen boiler, I make a deduction from house heating rules. One square foot of surface in a coil, under such circumstances, would carry 40 square feet of radiation, and assuming that there is a pint of water to the square foot, 1 foot in the coil should heat 5 gallons of water, and as the coil has 14 feet of surface, it would probably heat 70 gallons. The house heating rules are based on heating the same water over and over, while in the case of "J. P." cold water would enter the boiler to be heated every time hot water was drawn. However, as the surface exposed by the boiler is so very much less for the water contained in a house heating system, it is probable that the coil would keep even a large boiler filled with hot water. I would risk a 100-gallon boiler in connection with it. In piping from the coil to the boiler, at the proper or most convenient place for connecting with the summer heater a Y should be placed on both the flow and return pipe for receiving the pipes from it. On the flow pipe from both the coil and the heater a gate valve should be placed to shut off whichever is not in use. As the boiler is connected with a supply pipe, no expansion tank will be needed. Owing to the warmer temperature of the supply water and the atmosphere, the work of the summer heater will not be so heavy as that of the coil, and a small heater will do the work. Even though the coil is made of 1¼ inch pipe, as stated, the connecting pipes may be 1¼ inch with some advantage, and the boiler connections should be full size.

Furnace Pipe Rule.

From E. T., *New York*.—If I had the problem which "H. E. G." presents in *The Metal Worker* February 2, I would calculate on a velocity of 400 feet per minute and filling the room in 15 minutes. I would then get the velocity to do the same work in one minute by multiplying the 400 by 15, which would give 6000. I would then divide the known quantity of air by 6000, which would give the area in feet of the opening necessary to let this amount of air through. I would then reduce the area in feet to inches and divide the result by 0.7854 and extract the square root of quotient. This would give the diameter of a pipe that would let the known quantity of air enter in 15 minutes at a velocity of 400 feet per minute. I would use a register with dimensions that would give an area 50 per cent. greater than the area of the pipe, as register faces are made much more solid or close than formerly.

Is It a Good Investment?

From T. W. R., *San Francisco*.—We reply to "J. B," New Jersey, in *The Metal Worker* of February 23. It may be a little late, but you will remember that we do not receive *The Metal Worker* until Saturday, it then being about a week old, but we thought our experience in regard to his inquiry might be of some use to him and also to others. We cannot agree with him in the economy of a circulating pipe being a good investment in connection with an ordinary cook stove for a heater. The great objection to a circulating pipe in an ordinary residence is that the constant traveling of the water through the pipe cools off the water, as the proportionate body of water carried in a ¾-inch pipe to the boiler is many times greater, consequently making it difficult to raise the temperature to the ordinary requirements for domestic use. I have seen new residences where the silver tongued plumber talked the owners into putting in a circulating pipe, there not being over 200 feet of hot water pipe, where the kitchen range could not raise the water above 110°, and by shutting off the circulating pipe it could raise the water to 160°. This is actual experience. Circulating pipes do not give satisfaction where the ordinary kitchen range is used as a heater. In large buildings, where large quantities of water are used and where a special heater or steam is used, then it is a paying investment. This experience is in California, and if it is not a success in our mild climate, it surely could not be where you have below zero weather.

Are Gravel Roofs Durable?

From W. F. COZZENS, *St. Louis*.—My attention has been called to an article in *The Metal Worker* of March 2, from G. F. Wheelock, Birmingham, Ala. His position in respect to the cost of a tin roof is well taken. I think, however, I can break the club to which he alludes as being in the hands of the gravel roofer. If he ever visits St. Louis—and Southerners do sometimes come here—I shall take pleasure in showing him tin roofs 36 years old, and one that I worked on 54 years ago, and which has not had more than one coat of paint in 20 years.

Keeping Shop Tools.

From ZENOPHEN.—I wish some of the contributors to the Letter Box would describe the best method of keeping shop tools. I will start the question ball rolling by asking for a good way to keep shop soldering coppers.

Pattern Wanted.

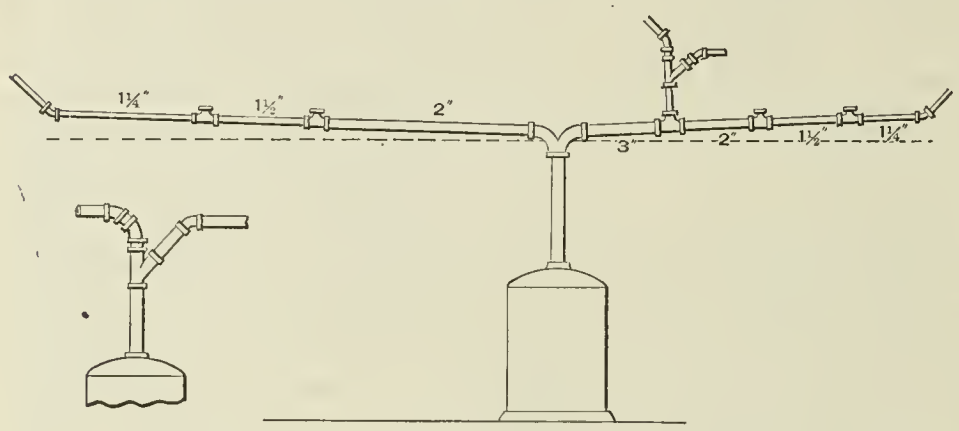
From C. R., *Baltimore, Md.*—Please ask some of the readers of *The Metal Worker* to submit a pattern for an 8-inch flaring collar to use in a square pipe. I think one of your former writers signing himself "Practical" described such a pattern.

STEAM AND HOT WATER.

A Pipe Fitting Question.

From SAMUEL HEINS, *Rondout, N. Y.*—Having snswered many questions of *The Metal Worker* on different subjects, and wishing to help my fellow workmen in ferreting out the defects on different kind of work, I read over *The Metal Worker* of February 9 and saw a pipe fitting question from "C. E." of Worcester, N. Y. With the experience I have had I think he makes a big mistake at the starting point on the boiler. I never approved of using a T when there are fittings made that would render better service. By using a twin ell or a Y with a nipple and a 45° ell he would get better results, as I will show further on. There is less friction with them and there would be a better circulation. There should never be any "bull nose" fittings used on hot water work. Each one of such fittings, especially elbows, is an obstruction. I would also recommend never to take any connections from the side of a fitting. They should be taken from the top with a short nipple and a 45° ell. As far as I understand it he would not get a good circulation. I would say that *The Metal Worker* is right as it explains the case. Let me say to "C. E." that the best way would be for him to experiment and find out himself which would be the best way. That is the way I would do. The way the best mechanics find out all the defects is by experiment. As the old saying is, "If at first you don't succeed, try, try again." I have had many difficulties in my past experience, and I started with steam and hot water heating when there were only about half a dozen men in the United States who did such work. I worked for Jas. P. Wood when he was the only man in Philadelphia who did steam heating, and we had to work hard, and it took a great deal of thinking to make a job work perfectly. Now every Tom, Dick and Harry that never served a day at the business comes out as a steam and hot water fitter. I remember one man in Riverton, N. J., who never saw a hot water valve or a hot water job done, and he did not know the minimum supply of different size pipes, but came out as a hot water and steam engineer. "C. E." starts off with a 3-inch pipe from boiler, which is the minimum flow that would be used for 500 to 800 square feet of direct radiation, which is large enough to supply a very good size job. I show in the sketch the way I would start. I never use any elbows if I can avoid them. The connection is made with a twin elbow. Another way of making the connection is with a Y and two nipples and two 45° ells.

By this method an essy flow will be started. A part of the labor on any job is making a plan of the proposed work, which should always be done. As I understand the branch on the main, it is intended that a T shall be placed on the riser in the same way as at the boiler. If I was doing the job I would put in a Y and with 45° ells make the turns as shown. This would make a first-class job and a free circulation, but my advice to "C. E." would be to study up on steam and hot water heating.



A Pipe Fitting Question.

Loss of Heat and Radiation.

From FRANK J. GRODAVENT, *Denver, Col.*—I have taken some interest in the questions of "H. T. G." on the loss of heat and radiation, as published in the issue of *The Metal Worker* for February 9, 1895, page 45. I have looked up the back issues of *The Metal Worker* for 1892 containing the articles of Leicester Allen on this subject, and to which you refer. In the issue of October 1, 1892, psge 38, in which illustrations of different constructions of walls are given, and practical example taken of Fig. 21 to show the application of the different rules given, there are a few points of doubt to me about which I desire to question. I have been over the several articles published by Mr. Allen, and they contain some most valuable ideas, and lead direct to the subject, and it is their many good points which make me the more desirable to clear the cloud of doubt. In going through the articles I found a number of errors regarding reference letters and decimals, but these I have corrected. The practical example is the one upon which I desire information, and relates to Fig. 21. First, regarding the second coefficient of transmission being 0.4411. Is this amount correct? Conduction for lath and plastering 1 inch thick being 3.86 units of heat per square foot per hour, for ⅞ inch (being less than 1 inch) would naturally lose more heat units than if 1 inch thick. Seven eighths inch equals 0.875 inch; 3.86 divided by 0.875 equals 4 411 as the units of heat lost through 1 square foot of lath and plaster in one hour. It therefore seems to me that 4 411 should represent the second coefficient of transmission, instead of 0.4411 as published. The third coefficient of transmission as published is 1.2100, and I cannot see why 1.2100 should be called the second coefficient of transmission, and used in the first part of "operation second"—viz., "1.1558 divided by 1.2100 equals 0.3931." First coefficient as published is 1.1558, and the second coefficient as published is 0.4411. If this 0.4411 is correct instead of 4.411, as I have questioned, why do we not divide 1.1558 by 0.4411, instead of by 1.2100, which is published as the third coefficient of transmission, and to which reference as the third coefficient of transmission is made in the fourth column, page 38, issue of October 1, 1892? These articles of Mr. Allen's are very useful, but with a hitch like this in his plain way of explanation leaves a doubt in the final result not satisfactory. Possibly there are others who are in doubt on the same matter. If it can be made more clear I for one will be glad to receive an explanation that I may further investigate this most interesting subject.

Answer.—The above letter was submitted to Mr. Allen, and he furnishes the following reply:

I offer your correspondent my hearty thanks for his criticism of the figures given in the example of the application of Rule I in my article on the above subject in *The Metal Worker*, October 1, 1892. The whole of that arithmetical computation was performed by a trusted assistant, as explained near the top of the fourth column on the same page. I was too busy at the time the article was printed to give it the attention it demanded. I did not see the proofs before printing, and having looked at the series only in the most cursory way since it was published, I had not discovered the errors pointed out. The rules and formulæ, which had been for some years prepared before they were published, are not vitiated by these figures. A writer in the *Popular Science Monthly* has recently said: "We often find that the errors in a conscientiously thought out thesis lead to a more thorough understanding of the subject than would have been attained had all the propositions been demonstrably true." I hope this case will prove no exception to that wise saying, although here it is only a mistake in the application, not the theorem that is questioned. If the

reasoning given at the conclusion of the article, and on which the rules are based, be not challenged (and so far no one has done this to my knowledge), the rules must stand good, and the application can be easily made to any particular case. The errors he points out in the working out of the example are admitted. It simply remains to correct them in order to reach an exact result.

The second coefficient in the computation is vitiated by the displacement of the decimal point and should be 4.411. With this correction we have, first, coefficient = 11.1558; second, 4.411; third, 1.2100; fourth, 1.1558; fifth, 1.1558; sixth, 2.50; and, seventh, 1.1558. In the second operation occurs the erroneous use of the third coefficient instead of the second in obtaining the first quotient. This quotient ought, therefore, to be $\frac{1.1558}{4.441} = 0.2600$, instead of 0.3931, as stated, and the second quotient should be $\frac{1.1588}{1.2100} = 0.9552$, instead of 1.0000. I also notice that in the fraction from which the fifth quotient in the second operation is derived the decimal point is dropped out of the denominator, although the quotient itself, as given after the sign of equality, is printed correctly. The sum of the corrected quotients and the first coefficient (according to the rule) will be 5.8360, which is the correct divisor or denominator of the fraction in the last operation whereby the temperature difference between the surface of the plaster and that of the interior air and objects is expressed. The numerator of that fraction is printed 700, instead of 70°, as it should have been, but the following quotient plainly shows that it was intended to be 70°. Now writing this fraction again, with both numerator and denominator corrected, we have $\frac{70°}{5.8360} = 11.994°$, the interior temperature difference sought, instead of 11.643° as published. The difference is 0.351°. Fortunately, in this case one error corrected another so largely that the final result differs by only a trifle more than ¼° from the true difference. If the difference originally stated has been taken on trust by any one without going over the figures, it cannot, therefore, have misled any one materially. It is because it so closely approached the figure for this difference as recorded in my note book for a wall of the kind for which the calculation was made that I accepted the calculation as correct, and incorporated it into the manuscript of the article published on the date named.

In conclusion, I beg to again thank your correspondent not only for his discovery and criticism of these errors, but also for the courteous style of his criticism and the compliment he is pleased to bestow upon my humble effort to reach exact methods in a field where guesswork is much too common.

Heating Power of Petroleum and Gas Stoves.

Some very interesting information is contained in the following paper by Thos. Fletcher, the well-known gas engineer, which we reprint from an English exchange:

The data from which the following comparisons are made are too long and technical for the general reader, but those who wish to study the subject thoroughly and verify the results, will find the matter dealt with by Deville (*Comptes Rendus*) and Box ("Treatise on Heat"). The heating power of ordinary coal gas has been repeatedly verified, and the standard universally accepted is what is known as the British thermal unit—*i.e.*, the amount of heat necessary to raise the temperature of 1 pound of water 1° F. One cubic foot of ordinary London gas has heating power equal to 660 of these units—*i e.*, if all the heat evolved in burning is perfectly utilized, 1 cubic foot of gas will heat 660 pounds of water, equal to 66 (Imperial) gallons, 1° F., or 6⅔ gallons 10° F. The heating power of an average sample of ordinary petroleum is 161.920 units per gallon, and if all the heat is perfectly utilized without waste, 1 gallon of petroleum will have the same heating power as 245 cubic feet of gas. If we take the price of gas at 2 shillings and 6 pence (62 cents) per 1000 cubic feet, the value of petroleum as a fuel should be 7½ pence (15 cents) per gallon, as compared with gas under the same conditions.

When these fuels are used in flueless stoves of any kind and the combustion is perfect the whole of the theoretical heating power given above can be and is obtained in ordinary use in heating the air. Either 245 cubic feet of gas or 1 gallon of petroleum will in a flueless stove raise the temperature of 603,000 cubic feet of air 20° F. The figures appear large, but the amount of heat required to raise the temperature of air is so exceedingly small that the figures become almost beyond the power of imagination. It will make matters more clear to deal with smaller quantities. One ounce of petroleum and 2 cubic feet of gas have precisely the same heating power, and either if perfectly burnt in a flueless stove will heat a quantity of air equal to that contained in a room 23 feet square and 10 feet high 20° F. Of course, nothing approaching this is obtained in practice for two very sufficient reasons: The walls, windows and ceiling absorb the heat rapidly, and the air in an ordinary room is on an average changed every 20 minutes by natural ventilation. Even when the walls, &c, are heated to the same temperature as the air it has been found by repeated trials that in a room this size the loss by conduction of the heat through walls, &c., is equal to that given off by the combustion of 15 cubic feet of gas per hour, and this added to the loss by ventilation makes a total of 21 cubic feet of gas, or 10½ ounces of petroleum per hour, to retain a rise of 20° F. where the room is continuously heated day and night. Of course, when the heat is only intermittent more will be required until the temperature of the walls corresponds with that of the air. and the raising of the temperature of these is a very slow process.

When we come to the heating of water or solid objects conditions are greatly changed, owing to the great loss of heat which is necessary in ordinary practice. Even with gas, in a perfect atmospheric burner with flame contact under the best conditions, water cannot be boiled in a copper pan without a loss of at least one-third of the heat; and with a petroleum lamp nearly two-thirds are lost owing to the impossibility of flame contact, which would cause smoking. The practical result is that for boiling water, the comparative value of petroleum, as compared with gas at 2 shillings and 6 pence (62 cents) per 1000 cubic feet, will not exceed about 4 pence (8 cents) per gallon.

Circuit Systems of Hot Water.

From PIPER, *Illinois.*—Is it practicable to pipe hot water heaters on the one-pipe system—that is, to use but one main from the boiler and to connect both flow and returns from the radiators with it, instead of running a separate flow and return main? In the one-pipe system, will the radiators that are furthest from the boiler get as warm as those that are nearer and get the water first? Will not the water be colder after passing the first radiator on the run, and so continue to grow colder after passing each successive radiator? Will the one-pipe system give as good results as the two-pipe system?

Note.—Some heating men have found no difficulty in making a hot water circuit system satisfactory. In making connection with the radiators, the flow connection is taken from the top of the circuit main, and the return from the radiator is connected with the side of the main. By this means the colder water from the radiator does not lower the temperature of the water in the top of the main to any considerable extent. In proportioning circuit mains some use the area of 1¼-inch pipe for each 100 feet of radiation, which is a more generous proportion than is usually applied. By this means the main has a considerably larger area than the connections to the radiators, permitting the water which is returned cool from the radiators to flow along the bottom of the main without influencing the hotter water in the upper part. Nevertheless, it has been found that the first radiators on a circuit system become somewhat hotter than those at the latter end. In consequence, some place a greater amount of radiation in the rooms that are fed on the last end of the circuit. Where a circuit system that is properly proportioned has been installed, satisfactory results are obtained. It is claimed by those who have had the most experience with it that it is not adapted for all classes of buildings. Some information on this subject will be found on page 40 of *The Metal Worker* of March 2. We will be glad to have our readers discuss this subject more fully.

G. B. LEONARD has discontinued his business at La Salle and moved to Chicago, where as one of the partners in the firm of Leonard & Weinberg, 4316 Cottage Grove avenue, he has engaged in the heating and plumbing business. He reports the prospects for good trade as excellent, and mentions that they have on hand at present from $3000 to $4000 worth of heating contracts and expect soon to have their shipping and show rooms in good order.

Formula for Hot Water Piping.

BY J. L. BIXBY, JR.

The following original and purely empirical formula for calculating the size of pipes for hot water heating may be of interest to the readers of *The Metal Worker:*

Sq. ft. = square feet of surface.

D = diameter of pipe in inches.

$\sqrt[5]{F}$ = fifth root of the floor, as first, second, &c.

INDIRECT RADIATORS.

$$\text{Sq. ft.} = \frac{100 \times D^2}{3} \qquad D = \sqrt{\frac{3 \times \text{sq. ft.}}{100}}$$

FIRST-FLOOR RADIATORS.

$$\text{Sq. ft.} = \frac{100 \times D^2}{2} \qquad D = \sqrt{\frac{2 \times \text{sq. ft.}}{.00}}$$

RADIATORS FROM RISERS.

$$\text{Sq. ft.} = \frac{100 \times \sqrt[5]{F} \times D^2}{2} \qquad D = \sqrt{\frac{2 \times \text{sq ft.}}{100 \times \sqrt[5]{F}}}$$

The appended table gives the square of the nominal diameter of the pipes in inches and the fifth root of the floors. The allowable variation from the answers given by the formula is the mean between the next larger and smaller size pipe. The allowable distance of the radiators from the boiler equals about one-half of the square feet of surface in the radiators. The heating surface in the main pipes must be included in the radiation.

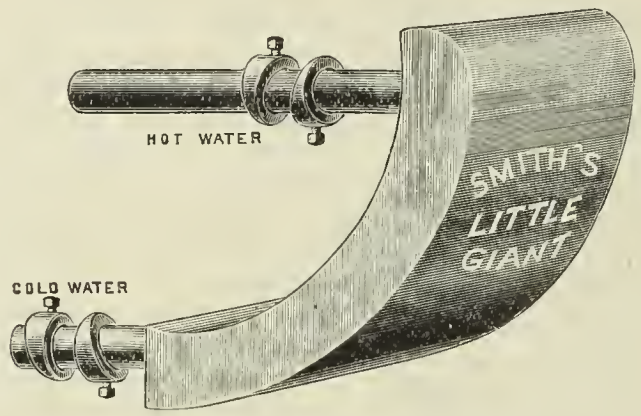
Nominal diam.	D^2	Floor.	$\sqrt[5]{F}$
½	0.25	1	1
¾	0.5626	2	1.15
1	1	3	1.24
1¼	1.563	4	1.32
1½	2.250	5	1.38
2	4	6	1.43
2½	6.250	7	1.47
3	9	8	1.52
3½	12 25	9	1.55
4	16	10	1.58
4½	20.25	11	1.61
5	25	12	1.64
6	36	13	1.67
7	49	14	1.69
8	64	15	1.71
9	81	16	1.74
10	100	17	1.76
11	121	18	1.78
12	144	19	1.80
13	169	20	1.82
14	196	21	1.84
15	225	22	1.86

A NEW CORPORATION at Columbus, Ohio, are the Columbus Steam Boiler & Heater Company. The company have a capital stock of $5000 and are formed for the purpose of repairing and manufacturing steam boilers and heaters, tanks, stacks, water towers and the manufacturing of sheet and rolled iron work, the incorporators being William H. Page, William A. Pope, Dennis J. O'Grady, R. T. Huggard and Thomas O'Hare.

Smith's Little Giant Water Heater.

An illustration is herewith given of an attachment intended for use with any warm air furnace. It is placed in the upper section of the fire chamber opposite the feed door, holes being drilled in the furnace casting for the passage of the flow and return pipes. Being placed in this position, above the fire, its curved shape and broad surface cause it to receive the full benefit of the coal consumed without detracting from the general heating power of the furnace. The flow and return pipes are threaded for connection with pipes running through the house. They are also fitted with washers so shaped as to set snugly against the furnace casing and prevent the escape of gas and smoke. Set screws hold the washers tightly in place.

This water heater is designed for two kinds of service. In the first place, it can be used for combination heating, to warm one or two rooms more than can be heated by the furnace, or which are too remote to be easily reached by warm air flues. In the second place, it is adapted to houses in which cooking is done exclusively with gas or gasoline, as while the furnace is in operation the house is supplied with an abundance of hot water without additional cost. Four sizes are made, which are rated to carry respectively 30, 50, 75 and 100 feet of radiation. The Little Giant is manufactured and sold by Charles Smith, 175 and 177 Lake street, Chicago.



Smith's Little Giant Water Heater.

HEATING NOTES.

STEWART A. JELLETT, Philadelphia, president of the American Society of Heating and Ventilating Engineers, had a visit from Vice-President W. M. Mackay of New York this week.

THE KALAMAZOO RADIATOR COMPANY of Kalamazoo, Mich., have opened a salesroom for their radiators at 96 Lake street, Chicago, which will be in charge of Clarence M. Converse.

WE ARE REQUESTED by the Gurney Heater Mfg. Company, Boston, Mass., to state that they have no agency in New York City and that their goods are for sale to any of the trade who might apply for prices.

THE SMITH & WINCHESTER COMPANY, Boston, Mass., send out on the back of an advertising card an acrostic furnished by J. M. Knox of Chicopee, Mass. The verses, in which the initial letters spell "The Winchester Boiler The Best," relate to this well-known apparatus and tells in rhythmical fashion what a great boiler it is.

PRESIDENT JOSEPH BOND of the American Radiator Company had the honor of taking luncheon with the Lord Mayor of London, at the Mansion House in that city on February 28, and also had the pleasure of meeting the Lady Mayoress and family, several members of Parliament, generals and other dignitaries.

J. EDGAR TITZELL, Millerstown, Pa, has added steam and hot water heating to his business and will be glad to receive catalogues and other printed matter from the trade.

W. B GRAVES, foreman of the steam and hot water department of the E. W. Oliver Company, Niagara Falls, N. Y., has tendered his resignation. Mr. Graves has purchased a one-half interest in the establishment of his brother, C. H. Graves of 62 North Clark street, Chicago, who is in the steam heating business.

IN AN ADDRESS before the Stationary Engineers' Association No. 2 of Cincinnati on Wednesday evening, March 13, delivered by Capt. W. H. Meredith, an old marine engineer, the speaker said that in a long experience he had found that the practice of heating and ventilating required more actual ability to carry it through successfully than any branch of engineering he knew of. The speaker went on to show the parallelism between the steam heating plant and the human body. "Let the boiler," he said, "represent the stomach receiving the fuel. Here combustion takes place and starts the vapor on its course through all the ramifications, finally entering the radiator, and there giving up its heat and being condensed into water, it again returns to the boiler through the return pipe, there to receive more heat and start on its circuit again The steam pipes represent the arterial system and the return pipes the venous system of the human body, and the blood flows through the lungs, taking up fresh oxygen and passes on, giving strength, tone and tissue to the body. So also the vaporized water of the heating apparatus gives warmth, comfort and life to those who use it."

THE AMERICAN RADIATOR COMPANY will establish their London office at 143 Queen Victoria street and expect to occupy it by April 1. A commodious storeroom in connection will give ample space for the display of samples of all kinds of heating apparatus and specialties of American manufacture. The location is a most convenient and desirable one, and the company desire that those of the trade who visit across the water should be sure to make that office their headquarters.

The State Department at Washington is about completing a work which will be of great utility to manufacturers and others who are connected with the Central and South American trade. It is a compilation which has been in course of preparation for some time, under a provision adopted by the International American Conference some time since. The work in question is an "International Catalogue of Exports and Imports," containing a uniform nomenclature of articles of merchandise such as are common in the trade between the United States and the Latin-American countries. The terms will be published in English, Spanish and Portuguese,

and the publication will probably be sold to business houses at the cost of printing.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until April 4, for work, including the plumbing, for the United States Court House and Post Office, New Albany, Ind. Drawings and specifications may be obtained from the custodian at New Albany.

THE BOARD OF EDUCATION of Erie, Pa., are to readvertise for bids for heating and ventilating schools 4 and 14.

W. F. RUTTER & Co., Lawrence, Mass., bid $1841 and secured the plumbing contract which requires McShane water closets for the John Tarbox School.

THE H. R. BARKER COMPANY, Lowell, Mass., have the contract for the piping and plumbing in the Shattuck Street Universalist Church.

THE CONTRACT for repairing the steam pipes in the Federal Building, Rochester, N. Y., the estimated cost of which is $900, has been let to Roeser & Co.

A SEPARATE building for housing a system of water closets is to be erected in connection with one of the school buildings at Utica, N. Y.

GEO. B. MARTIN, New Haven, Conn., is building a fine residence in which specially fine plumbing will be required from the successful bidder for the contract.

THE FOSKETT & BISHOP COMPANY, New Haven, Conn., have the contract for the heating and plumbing in a new residence for H. C. Warren.

W. A. T. SMITH, agent for the Kelsey Heat Generator in New Haven, Conn., has recently placed heaters for A. E. Blakeslee, A. J. Carmichael, E. F. Wilson and S. A. Hopkins. Mr. Smith calls attention to the fact that by the peculiar construction of the Kelsey it is adapted for heating rooms in large houses, however remote from the heater. The hot air chambers are built in sections and by this means the hot air from any number of these sections may be directed to any particular room. It is claimed for the Kelsey that it has a large radiating surface and gives a great heat for the amount of coal burned.

SEALED PROPOSALS, addressed to Geo. W. Kerker, Davenport, Iowa., chairman of City Hall Committee, will be received at the office of the Board of Public Works until 2 p.m. Wednesday, March 27, 1895, for all labor and material required for the steam heating, plumbing, gas fitting, electric wiring, and for a complete electric passenger elevator, with all necessary machinery and fixtures, for the new City Hall, in accordance with the plans and specifications now on file in the office of J. W. Ross, architect of said building.

SHEAHAN & GROARK, New Haven, Conn., are doing the plumbing and furnace heating of C. M. Fisher's new house; they are putting two hot air furnaces in Dr. Cremin's house, two in L. P. Sperry's house, and they are doing the plumbing and steam heating in James F. Molloy & Co.'s new factory. They are also thoroughly overhauling the steam heating of the Winchester Avenue Railroad car houses in West Haven and have put in between 2 and 3 miles of piping in the Fair Haven and Westville car houses.

GEORGE F. HAUSLEIN, 80 Fullerton avenue, Chicago, has the contract for plumbing and drainage in the residence of Louis Reemer, 1434 Marshfield avenue.

NELSON & CEDERHOLM, 87 West Ohio street, Chicago, have the contract for the plumbing and drainage in the flat building of J. Gustafson, 183 Richmond street.

WILLIAM READ, 345 Forty-third street, Chicago, is to do the plumbing and drainage in the 15 residences and cottages being built by W. Frenk on Blue Island avenue, Leavett street, Hoyne avenue and Oakley avenue.

FRANK FALK, 729 Milwaukee avenue, Chicago, is to do the plumbing and drainage in the residence of J. P. Rusthoe, Mead street and Milwaukee avenue.

JOHN K. MORAN, 4139 Wentworth avenue, Chicago, has the contract for the plumbing and drainage in the flat building of G. Krahn, 1015 Fifty-first court.

JAMES J. DOYLE, 6040 South Halsted street, Chicago, has the contract for the plumbing and drainage in the flat building of B. F. Jones, Sixtieth and Aberdeen streets.

THE GEORGE ALIES ESTATE, 463 Division street, Chicago, has the contract for the plumbing and drainage in the store and flat building of Adolph Kruse, 2241 North Ashland avenue.

ERNST GARNER, 1740 Milwaukee avenue, Chicago, has the contract for the plumbing and drainage in the residence of E. Melins, 790 Wallace street.

JACOB E. HEDMAN, 656 West Division street, Chicago, is to do the plumbing and drainage in the flat building of William Ballman, 838 West Ohio street.

HARVEY & MOSE, 665 West North avenue, Chicago, are to do the plumbing and drainage in the flat building of B. Larson, 213 Evergreen avenue.

BYRNE & RYAN, 254 Forty-third street, Chicago, are to do the plumbing and drainage in the flat building of T. J. Davis, Sixty-fourth street and Evans avenue.

DORE & SON, 1042 West Van Buren street, Chicago, have the contract for the plumbing and drainage in the flat building of W. Farson, Birch and Kendell streets.

CHARLES C. BREYER, 187 West Division street, Chicago, has the contracts for the plumbing and sewerage in the flat building of J. H. Dittmer, 483 Potomac avenue, and in the store and flat building of J. Palenske, 802 North Hoyne avenue.

JOHN C. HICKEY, 551 South Ashland avenue, Chicago, has the contract for the plumbing and drainage in the flat building of C. Kastler, 117 Edgemont avenue.

ROBERT C. MILLER, 897 West North avenue, Chicago, is to do the plumbing and drainage in the store and flat building of A. W. Wolff, 1485 same street.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until April 19 for a low pressure return circulation steam heating and ventilating apparatus for the United States Post Office Building at Lima, Ohio. Drawings and specifications may be obtained from the office of the Supervising Architect, Washington, or from the superintendent at Lima.

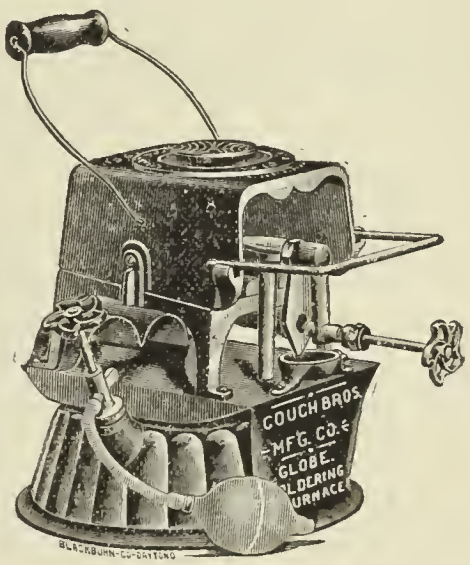
KEEFE & WARNOCK, 1105 Lincoln avenue, Chicago, is to do the plumbing and drainage in the nine cottages of L. P. Hammond, Gidding, and Lawrence avenues.

MORRIS BROS., 3442 South Halsted street, Chicago, are to do the plumbing and drainage in the store and flat building of W. Marks, 2953 Archer avenue.

ARNOLD W. ZIMMERMANN, 10,571 Meridian avenue, Chicago, has the contract for the plumbing and drainage in the residence of George Morrison, 104th and Charles streets.

The Globe Soldering Furnace.

The accompanying illustration shows the Globe soldering furnace manufactured by Couch Brothers, Dayton, Ohio. This new Globe furnace which the concern have brought out has a stationary generator so arranged that the flame will light the burner from the generator. Special attention is called to their new goose head generator, which is described as an entirely new feature. The construction of the goose head is simple and very efficient in the production of gas. It is noted that the shape and construction of the burner is such that it will not clog up by the dripping of solder. It is said to be very quick in heating and melting metal and another advantage is its lightness, it weighing about 11 pounds and being but 10 inches in hight.



The Globe Soldering Furnace.

A bill has been prepared for presentation to the New York Legislature authorizing the erection of a bridge over the East River from Grand street, New York, to Broadway, Williamsburg. The project meets with general support, and it is proposed that the two cities unite in erecting the new structure in the same manner as was the case with the existing Brooklyn Bridge. The necessity of additional means of transportation other than by ferryboat is daily becoming more pressing, as the inhabitants of the Eastern District of Brooklyn have found to their cost on several occasions during the past winter when ice or fog have prevented the regular running of the ferry steamers.

THE TIN SHOP.

Pattern for Offset, Oblong to Round.

From E S., *New York.*—In Fig. 1, let A B C D E F G H represent the elevation of an offset, oblong to round. A B G H represents the round pipe, C D E F the oblong, and B C F G the transition from oblong to round. In the plan, J K L M represents the round pipe, N O P Q R S the oblong, and J N S, L P Q the two triangles necessary to effect the transition. Two sections of cones are also shown by J K N O P L and J M S R Q L. As a cut through a cylinder oblique to its axis is an ellipse, the cut through the cylinder A B G H produced by the line B G will be an ellipse. A similar result will be produced by cutting the oblong C D E F by the oblique line C F. In order to obtain the pattern of B C F G of elevation, it will be necessary to obtain the shapes on lines B G and C F.

In Fig. 2, C D E F represents a duplicate of oblong shown in elevation by similar letters. To obtain the shape of cut on line C F, proceed as follows: Above and in line with C D E F draw the half plan of oblong, as shown by D N O P E. Divide the semicircle N O P into any convenient number of equal parts, as shown by the small figures. With the blade of the T square placed at right angles to D E, drop lines cutting C F. With the T-square placed at right angles to C F, and brought against the points in C F, draw lines, extending them indefinitely, as shown. Measuring in each instance from C F, set off on the lines just drawn the same length as similar lines in D N O P E, and through the points thus obtained trace a line, as shown by *n o p*. Then C F *p o n* is the half shape of cut on the line C F. In Fig. 3, A M H represents the half profile of round pipe, above which is drawn the elevation of same, as shown by A B G H. To obtain the shape of cut on line B G, divide the half profile A M H into the same number of parts as was N Q P, and with the T-square placed parallel with A B, and brought successively against the points in A M H, carry lines cutting B G. With the T-square placed at right angles to B G, and brought against the points therein contained, erect perpendiculars, as shown. Measuring in each instance from B G, set off on the lines just drawn the same length

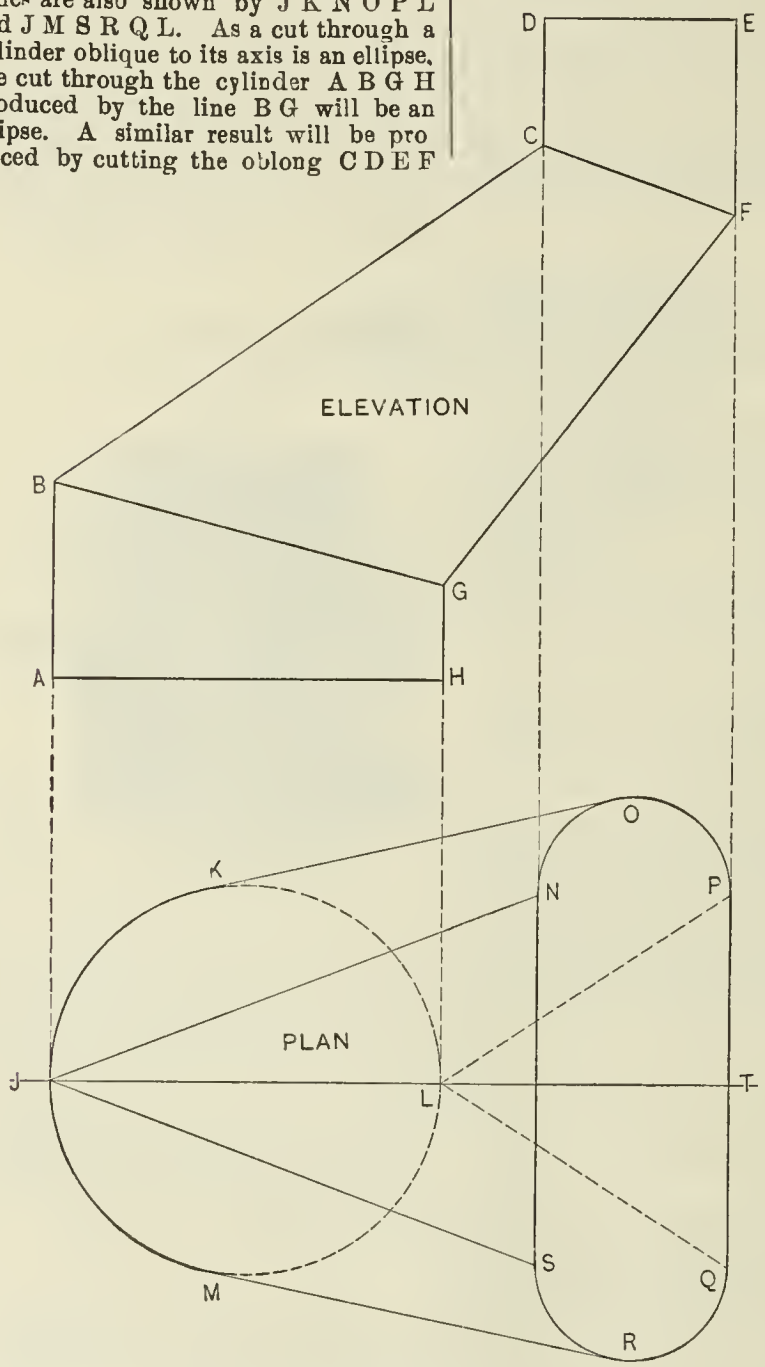


Fig 1.—*Plan and Elevation.*

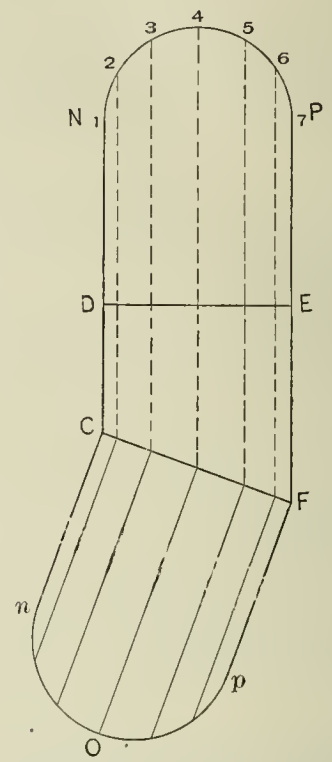


Fig. 2.—Method of Obtaining Shape on Line C F of Elevation.

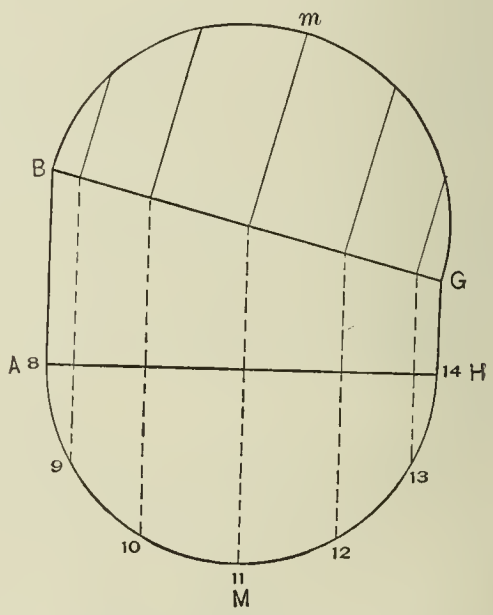


Fig. 3.—Method of Obtaining Shape on Line B G of Elevation.

PATTERN FOR OFFSET.

as similar lines in A M H, and through the points thus obtained trace a line, as shown by B *m* G. Then B *m* G is the half shape of cut on line B G. An inspection of the elevation will show that B C F G is the shape of that part of article on line J T of plan. In order to avoid a confusion of lines, a duplicate of B C F G is presented in Fig 4. On C F is drawn the shape C *n o p* F in Fig 2, and on B G the shape B *m* G in Fig. 3. Connect the points in B G with those in C F, as shown by the solid lines, and also by the dotted lines. The up at right angles, to construct divisions that will give the distance from points in B *m* G to points in C *n o p* F,

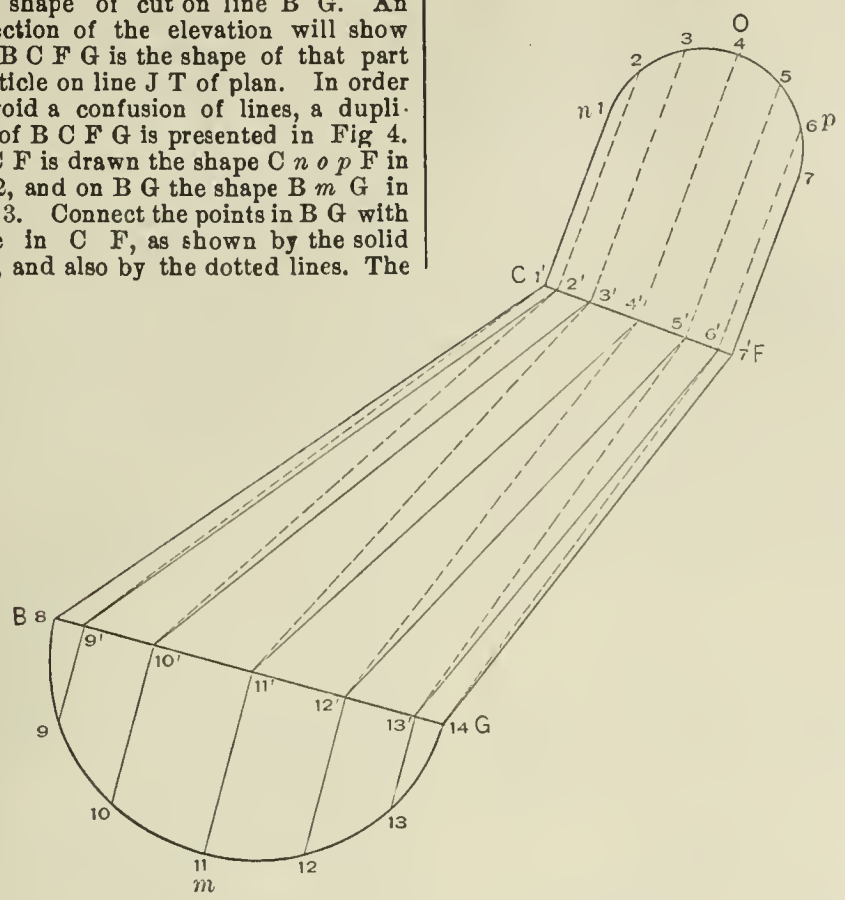


Fig. 4.—Divisions Drawn on B C F G of Elevation.

lines in B C F G of Fig. 4 are shown in Fig. 5. To construct these divisions proceed as follows: Draw the right angle U V W. From V, on V W, set off the length of lines in B *m* G, Fig. 4. From V, on V W, set off the length of lines in B C F G, and from the points thus obtained erect perpendiculars in length equal to lines of similar number in C *n o p* F, Fig. 4. Thus make line W 1′ of Fig. 5 equal to line C *n* of Fig. 4, and draw V 1′, which gives the distance from point B to point *n* in Fig. 4 as if measured on the finished article. Connect the perpendiculars drawn from V W with the points in V U, as shown, and corresponding with the figures in Fig. 4. Thus connect 1′ and 8, 2′ and 9, 3′ and 10, &c. The divisions shown in Fig. 6, which correspond with the dotted lines in Fig. 4, are constructed in a similar manner. Draw the right angle X Y Z, and from Y set off the length of lines in C *n o p* F. From Y, on Y X, set off the length of dotted lines in B C F G, and from the points thus obtained erect perpendiculars, in length equal to lines of similar number in C *n o p* F, as indicated by the small figures. Connect the perpendiculars drawn from X Y with the points in Y Z, as shown, and corresponding with the figures in B C F G. Thus connect 1 and 9′, 2 and 10′, 3 and 11′, &c.

In the pattern, Fig 7, *x s r g t* represents the stretchout of C *n o p* F, as *j m l* does of B *m* G. To obtain the pattern shown in Fig. 7, using for the

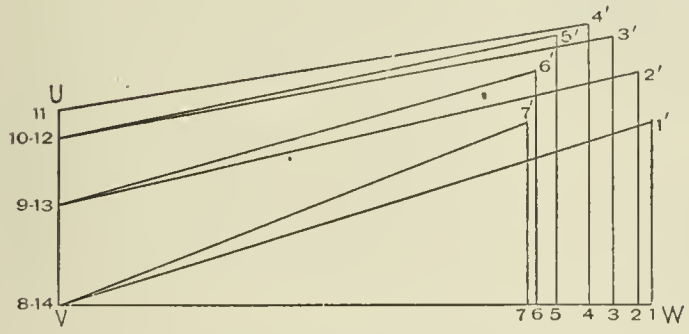


Fig. 5.—Divisions Represented by Solid Lines in Fig. 4.

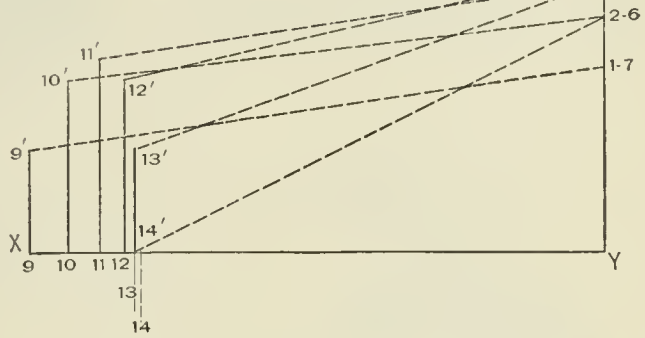


Fig. 6.—Divisions Represented by Dotted Lines in Fig. 4.

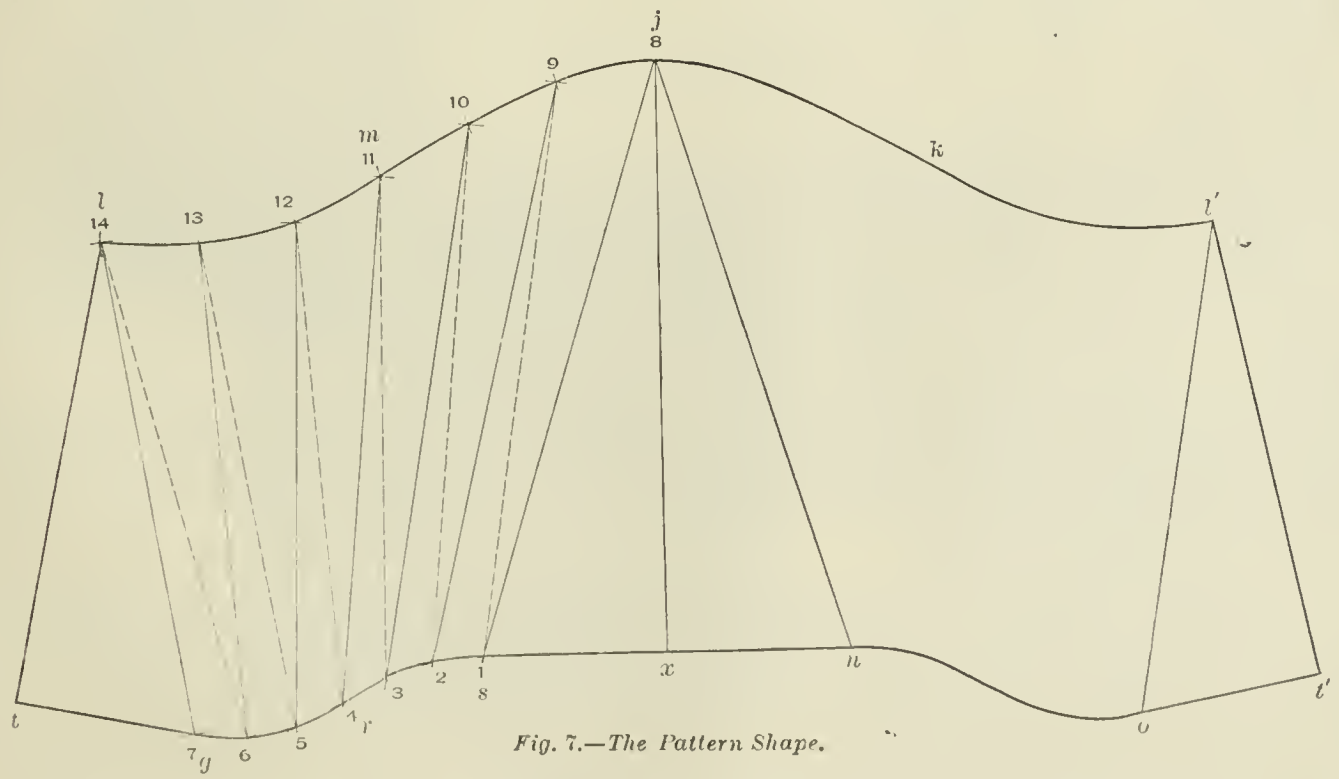


Fig. 7.—The Pattern Shape.

PATTERN FOR OFFSET.

method we shall pursue for obtaining the pattern will be as follows: Supposing B *m* G and C *n o p* F to be bent as indicated by the solid and dotted lines in B C F G, Fig. 4.

The divisions represented by solid purpose diagrams 4, 5 and 6, proceed as follows: At any convenient place draw the line *j x* of pattern in length equal

to V W of Fig. 5. With *x* as center, with radius W 1′ of Fig. 5, describe a small arc. With *j* as center, with radius V 1′, describe a small arc intersecting the one just drawn, thus establishing the point *s* in pattern. Draw *x s* and *s j*. From the point *j* as center, with B 9 of Fig. 4 as radius, describe a small arc, as shown; then, with *s* as center and 1 9′ of Fig. 6 as radius, describe another arc intersecting the other, thus establishing point 9 of pattern. With point *s* of pattern as center, and *n* 2 of Fig. 4 as radius, describe a small arc, which intersect with one struck from point 9 as center, and 9 2′ of Fig. 5 as radius, thus establishlishing point 2 of pattern. Proceed in this manner, using the tops of sections in Fig. 5 for the distances represented in pattern by the solid lines, the tops of sections in Fig. 6 for the distances represented by the dotted lines, the stretchout of *n o p* for the distance between points in *s r g*, and the stretchout of B *m* G for the distance between points in *j m l*. Trace lines through the points thus obtained, as shown. From *g* of parallel to the stretchout line, and, bringing it successively against the points in C F, cut corresponding measuring lines. Trace a line through the points thus obtained, as indicated by F″ C″. which forms the desired pattern. In Fig. 9, A B G H represents the round part of offset, as indicated by similar letters in elevation. A M H is the half profile. The half pattern, as shown by G″ B″ A″ H″, can be obtained from Figs. 1 or 2, but as in the previous instance, for the purpose of avoiding a confusion of lines a separate diagram is used. To obtain the pattern divide the half profile A M H into any convenient number of parts. Place the T-square

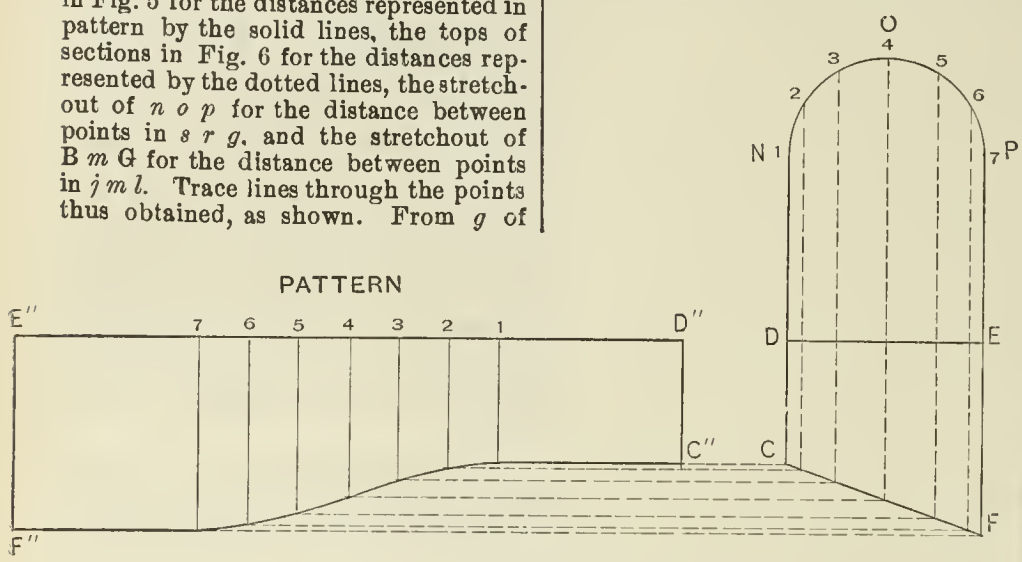


Fig. 8.—Half Pattern of Oblong Part.

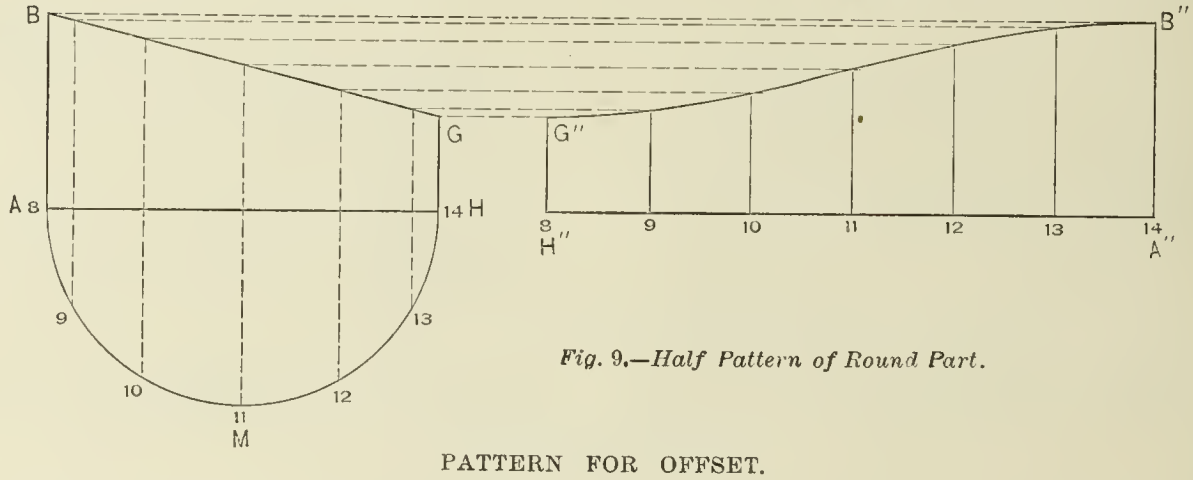


Fig. 9.—Half Pattern of Round Part.

PATTERN FOR OFFSET.

pattern as center, with radius 7 7′ of Fig. 5, describe a small arc, which intersect with one struck from *l* of pattern as center and radius V 7 of Fig 5, thus establishing point *t* of pattern. Draw *l t* and *t g*, which completes the half of pattern. The other half can be obtained in a similar manner or by duplication.

The pattern of oblong part of offset, as shown by C D E F of elevation, or N O P Q R S of plan, can be obtained from Figs. 1 or 2, as may be desired. To avoid a confusion of lines the half pattern is obtained, as shown in Fig. 8, in which C D E F represents the elevation and D N O P E the half profile. To obtain the half pattern proceed as follows: Divide N O P of profile into any convenient number of parts, as indicated by the small figures. Place the T-square parallel with C D, and, bringing the blade successively against the several points in the profile, drop corresponding points on the miter line C F, as indicated by the dotted lines. On D E extended lay off a stretchout of D N O P E, and through the divisions draw the usual measuring lines, as shown. Place the blade of the T-square parallel with A B, and, bringing the blade successively against the several points in the profile, drop corresponding points on the miter line B G. On A H extended, as H″ A″, lay off a stretchout of A M H, and through the points thus obtained draw the usual measuring lines, as shown. Place the blade of the T-square parallel with the stretchout line H″ A″, and, bringing it against the several points in B G, cut corresponding measuring lines. A line traced through the several points thus obtained, as indicated by G″ B″, will form the desired pattern.

The Star Coupler Company, St. Louis, Mo., advise us of an order of considerable dimensions just received from the War Department of the United States to be delivered at Madison Barracks, Sackett's Harbor, N. Y. This order is the result of a sample lot sent in December last which were thoroughly tested and which the consulting engineer of the barracks, E. C. Knowlton, reported he had tested and found satisfactory under all conditions. The Star Coupler Company also advise us that the town of Staunton, Ill., began tapping the mains a week ago and are using the Star coupler exclusively in making the necessary connections. The same thing prevails in Venice, Ill.

The Hardening of Aluminum.

A tale which savors strongly of the romantic has come from Canada to the Boston *Herald*, and, after publication in that journal, has been reprinted in nearly all the daily and weekly newspapers. It is to the effect that F. Allard, the Canadian blacksmith "whose rediscovery of the lost Egyptian art of hardening copper stirred the mechanical world some three or four years ago," has recently succeeded in hardening aluminum, so as to give it the consistency and resistance of iron. According to the story, Mr. Allard has made a small cannon out of his hardened metal from which he is alleged to have obtained some astonishing results. The personality of the discoverer, as detailed in a special dispatch from Quebec to a leading New York paper, is calculated to lighten the impression of romance which surrounds this tale, being very suggestive of the ancient alchemists with their mysterious ways and occult arts. He is described as being an aged man who works in seclusion and who is very likely to die without revealing the secrets of the hardening of aluminum and copper which he holds, unless he is adequately rewarded for the discovery, the inference being that no time must be lost by capitalists in paying him for the precious secrets which he claims to possess. The redlscovery of the art of hardening copper, we are told, only failed to make the fortune of the ingenlous blacksmith "because of the expensiveness of the process." Will the present alleged discovery prove any more profitable to the author or to the world at large?

The Chilian Government has announced its intention of buying up all the existing railroads in the Republic in order to place them under State management.

Rumors, which have been flying around with some persistence during the week, assert the probability of a consolidation of the great electrical manufacturing interests of the country, including such corporations as the Westinghouse and the General Electric companies, placing them under the control of Standard Oil capital. This new gobble of that omniverous corporation has received a half-hearted denial from several parties interested in the reputed deal, yet the news contlnues to be reiterated.

THE RETAIL STORE.

Iron Platform for Cisterns and Wells.

The Bucket Pump Company, Cincinnati, Ohio, are introducing an iron platform for cisterns and wells in connection with their bucket pump as here shown. The platform, Fig. 1, is made

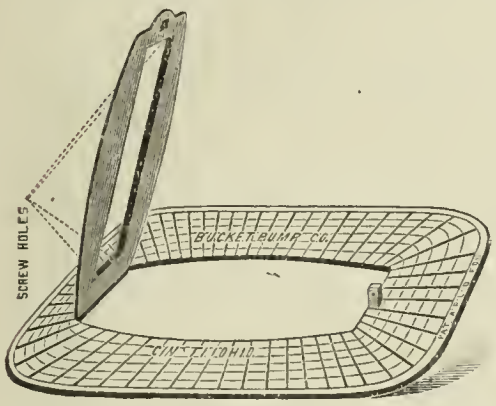


Fig. 1.—Iron Platform for Cisterns and Wells.

in two parts, the center portion being hinged, permitting it to be opened at right angles, leaving an opening 16 x 24 inches in size. The platform is corrugated, having an outward fall, also a small flange at the edge of the opening in the movable portion, into which the curb sets, to prevent filth, sediment, *débris*, &c., coming in contact with the water. The flange is fitted closely to the lower edge of the pump curb to prevent the water spreading and causing the curb to decay. The curb is permanently attached to the movable portion of the platform, as in Fig. 2, by screws, the position of the screw holes being shown in Fig. 1. This arrangement permits of ready access to the cistern or well, without removing screws, bolts, pump or platform, when it is desired to make repairs either to the cistern, well or pumping apparatus. The curb in such cases is turned back, when the chains swing back out of the way. When the repairs have been made the curb is turned again into position and a cotter is passed through the small lug at the front of the curb to hold the whole firmly in place. The manufacturers refer to the platform as strong, easily placed in position, and as inexpensive.

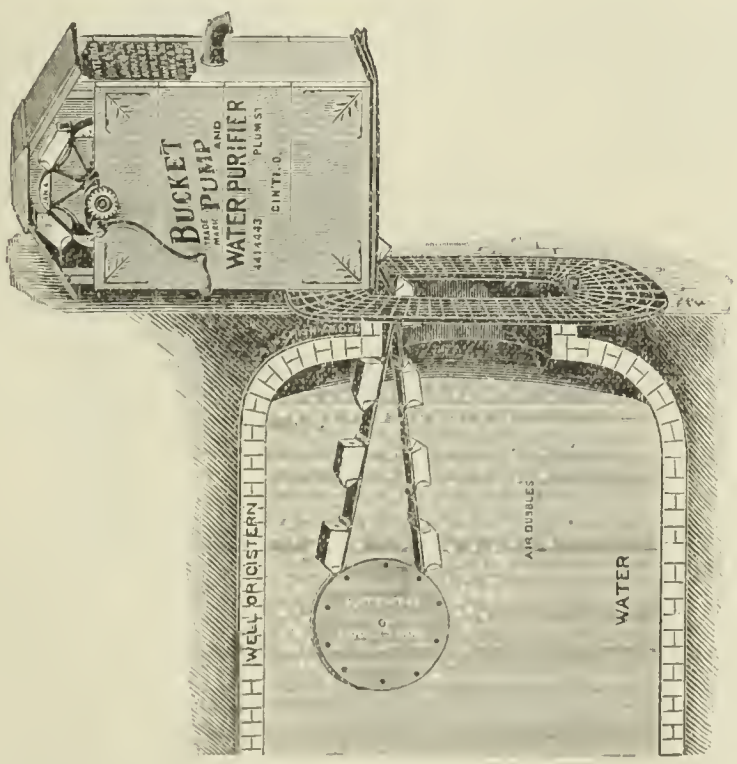


Fig. 2.—Pump Attached to Platform.

The Champion Roaster or Oven.

Illustrations are herewith given of a small portable oven which has just been brought out by the Leach Roaster & Baker Company of Paxton, Ill. The oven is compact in form and the shape makes it convenient to be used with great advantage on gasoline, gas, oil or coal stoves. It only requires a moderate heat and is stated to be practically automatic in its functions, requiring no basting. It has an air chamber which diffuses the heat equally throughout.

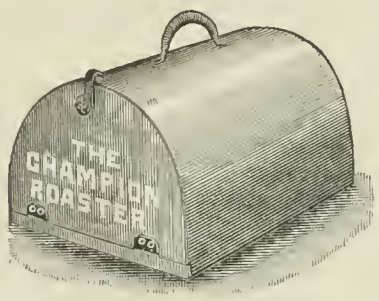


Fig. 1.—The Champion Roaster or Oven.

There are numerous uses for small portable ovens of this character which will suggest themselves to those who are familiar with cooking requirements. One special use is mentioned, however,

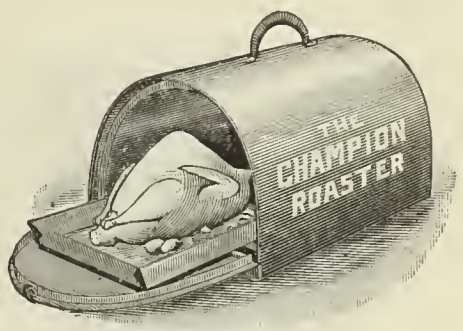


Fig. 2.—Roaster or Oven in Use.

in the fitness of this oven for camping parties.

West's Dust Pan.

James R. West of Gas City, Ind., is manufacturing the new dust pan which is herewith illustrated. It has a tread extending from the bottom of the pan, upon which the foot of the operator can be placed, which holds the pan firmly in position, enabling it to be used with a broom, thus avoiding the necessity of getting on the knees with a brush or stooping over. The pan has a large hood and the handle is very conveniently arranged.



West's Dust Pan.

REPRESENTATIVES of the various hardware firms of Milwaukee, Wis., met on the 11th inst., and decided to accept the proposition of the Milwaukee Gas Light Company in regard to selling gas ranges. From April 1 to August 1 gas ranges without water heaters can be bought at about half price and in addition the gas company will set the stoves in position, lay pipe and make connections free of charge. The company will pay to the hardware dealers the difference between the regular price and the new price.

Porcelain Lined Milk Delivery Can.

The Stuart & Peterson Company, Burlington, N. J., have augmented their line of Golden Crown ware by the addition of the porcelain lined milk delivery can here shown. It is made of cast iron, has a porcelain lining, and is supplied with either glass or porcelain lined iron covers. The article is designed to supersede glass jars and tin cans, over which it is said to possess an advantage, inasmuch as glass jars readily break and tin cans rust, and both have small necks which condense foul odors in cleaning. Another advantage it possesses is that it may be placed on a stove and the milk sterilized. It is made in sizes holding one and two quarts.



Porcelain Lined Milk Delivery Can.

Stove and Hardware Dealers Along the Hudson River.

BY HENDRICK.

At the foot of the Catskill Mountains and along the western shore of the historic Hudson are many flourishing towns in which will be found enterprising stove and hardware dealers.

At Catskill, N. Y., Day & Holt have been doing business for the past ten years. The firm is composed of J. Day and Samuel Holt. Mr. Day is also secretary of the Catskill Savings Institution, so that he devotes but little time to the hardware business. Mr. Holt can always be found in his office attending to the details of the business. The firm carry a large stock of heavy and shelf hardware, mechanics' tools, agricultural implements, stoves, ranges, &c. Of late they have given up considerable of their floor space to bicycles, which has grown to be an important branch of the trade. The Western Wheel Works' Crescent and the Overman Wheel Company's Victor are the leading goods handled by them. The firm also do a large plumbing, steam and hot water heating business, representing the Boynton Furnace Company of 214 Water street, New York. They have had excellent results from their hot water and steam heaters during the past winter. Mr. Holt is a firm believer in selling one line of ranges and stoves, and during the past four or five years they have pushed the sale of the Rochester Co-operative Stove Company's Red Cross ranges and stoves.

At the corner of Church and Main streets Russ & Beach have been doing business since 1860. They carry a large stock of general hardware, stoves, ranges, &c. Their leading lines of parlor stoves are the Fuller & Warren Company's, P. P. Stewart and the Splendid Diamond. Probably no other dealers along the Hudson River have sold more West Shore ranges than this concern, their sales running up in the hundreds on this popular range. They enjoy a good trade from the farmers, their place of business being conveniently located at the head of the street where they drive in to town.

Peary & Lobdell, in 1891, succeeded Brooks Brothers, and now occupy the large store on Main street, where they carry a stock of hardware and stoves and do a general tin and plumbing business. They enjoy a large trade on Rathbone, Sard & Co.'s Acorn and Philips & Clark Stove Company's Andes ranges and stoves. The young men have been very successful since their start in business four years ago.

The Richardson & Boynton Company are represented in Catskill by Adams & Spencer, who do a thriving business in steam and hot water heating, plumbing and tinning. They have built up a good trade on the company's Perfect line of ranges and furnaces.

Henry T. Jones & Son do considerable in tinning and plumbing. This firm are an important factor in the completion of Catskill's plumbers and tinners.

Ten miles up the Catskill Mountain Railroad is the summer resort of Cairo, noted in summer for city dudes and in the winter for its immense snowbanks. It is here that Decker & Olmstead have a model country tin and hardware store. They carry a good stock of hardware, tinware, stoves and agricultural implements, their leading line being the Syracuse Stove Company's Welcome ranges and heaters.

Frank M. Halstead carries on the stove and tin business at Ravena, selling the Fuller & Warren Company's Splendid Diamond and P. P. Stewart stoves.

At the same place is A. M. Stuvill, who sells the Perry Stove Company's Argand line. Healso carries a line of hardware, and does a general tin and jobbing business.

J. B. Holmes & Son carry on the stove and tin business at Coeymans. Mr. Holmes senior is an old settler in that part of the country, having started in business long before the late war. He often looks back, and refers to the time when they made their own tinware from plates free from the pin hole difficulty which is so prevalent among the tin plates of to-day. They carry a line of hardware, tinware and stoves, selling the Fuller & Warren Company's line of Splendid stoves, which have had a large sale with them.

At Coxsackie W. R. Church has been in business for many years, and carries a complete line of heavy and shelf hardware, tin, wooden ware and agricultural implements. He enjoys an excellent trade among the farmers for many miles back in the mountains. His leading lines of ranges and stoves are the Rochester Co-operative Stove Company's Red Cross, Van Wormer & Co.'s American heater and D. G. Littlefield's famous West Shore range.

W. A. Edwards occupies a large store on the main street, where he carries on a thriving business, selling the Perry Stove Company's Argand and Orr, Painter & Co.'s Sunshine. "Will," as he is known among the traveling men, prefers at any time to sit with them and tell funny stories rather than to buy goods, and he has many funny ones in store for those who are yet to visit him. He has recently remodeled his store, and it now presents an attractive appearance, and he will, no doubt, continue to enjoy a good trade among his many friends as in the past.

MEMORANDA.

HAMMER & FOWLKES have succeeded to the stove and hardware business at Bakerville, Tenn., formerly conducted by W. H. Fowlkes.

WADE BROTHERS, Prattsville, N. Y., have succeeded A. M. Allen, dealer in hardware, tinware, stoves and crockery.

THE G. S. BLODGETT COMPANY, Burlington, Vt., have purchased the stock and good will of A B. Kingsland & Co., of the same city, who have been dealers in stoves, tinware, &c., and have also conducted a plumbing, gas and steam fitting establishment. This consolidation makes the G. S. Blodgett Company one of the largest heating and plumbing concerns in northern New England. The latter firm have for a number of years done a large business in the above lines, and besides are known to the trade generally as manufacturers of the Blodgett portable oven, which is especially adapted for use in hotels, restaurants, steamships and large institutions, and is also used for japanning, core baking and the manufacture of confectionery. This business was established over 40 years ago by Blodgett & Sweet. The ovens were first manufactured by this concern and are now known all over the world. This firm continued for 20 years and then were succeeded by G. S. Blodgett and E. P. Manor, under the style of G. S. Blodgett & Co. Ten years later Mr. Manor died and George H. Holden took his place in the firm. The concern were incorporated in 1892 and continue as the G. S. Blodgett Company.

C. SIDNEY SHEPARD & Co., Chicago, Ill., issue a pretty little leaflet with the title "A Few Words About Aluminum and Aluminum Kitchen Utensils." The two inside pages give some interesting facts about aluminum covered by an article recently printed in *The Metal Worker*, from which long extracts are made. On the back of the leaflet it is stated that they have in preparation a catalogue of aluminum articles, some of which they mention by name.

E. E. KOHLER has purchased the stock of hardware of M. D. Comstock, Byron, Mich., and will continue the business and will likewise carry on a tin shop, which has been his line of work.

The returns of the Chief of the Bureau of Statistics at Washington for the month of February show that the imports into the United States during the month exceeded the exports by $2,017,809. In February, 1894, the expoits exceeded the imports by $11,812,190. During the eight months ended February 28, 1895, the excess of exports over imports was $91,967,932, and the excess for the corresponding period of the preceding year was $218,061,832.

The Pennsylvania State Legislature has passed a bill appropriating $500,000 for the improvement of the channel of the Delaware River.

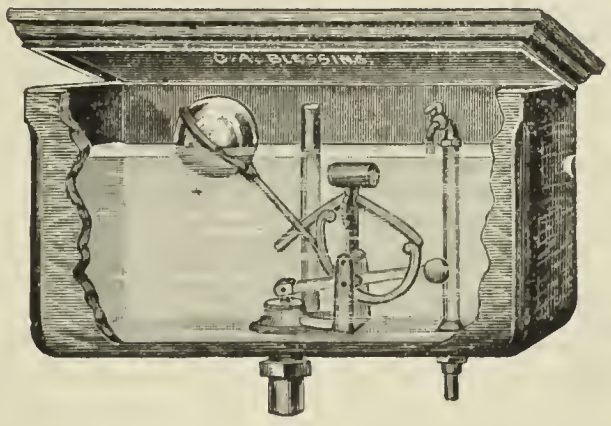
PLUMBING and GAS FITTING.

Public Conveniences.

The large cities of the United States are wretchedly equipped with public conveniences. The rule to leave the public to provide or do without them is so general that even the exception to prove it is difficult to discover. The need of these public conveniences was never made so clear as by a recent order from one of the public departments of the city of New York. It commands that none of its employees shall enter saloons during working hours, which, on its face, seems commendable. These employees, however, are collectors of ashes, garbage, &c., and would not be permitted to use the urinals and closets of stores, restaurants and hotels by the proprietors. The order has been broken by honest, hard working, well meaning men, who, as a result, have been discharged. If proper public conveniences were provided at frequent intervals throughout the city this hardship would not have been incurred, and owners of property having an open alley or driveway would have fewer nuisances to complain of. The plumbers would do well to bring their influence to bear on this matter.

Universal Urinal Tank.

C. A. Blessing, Philadelphia, has patented and is introducing to the trade the Universal urinal tank shown in the illustration herewith, which is designed for flushing urinals, hoppers and latrines. The tank is simple in construction and is described as being absolutely reliable in operation. The



Universal Urinal Tank.

parts are few in number. There is no ball cock used, the water entering by the supply pipe and cock seen at the right of the cut. The valve is operated by a balanced lever controlled by a fork which is combined with the valve stem. When the water entering the tank reaches a point about 1 inch from the top the ball float reaches its highest point and the end of the fork nearest the ball strikes a lug on the front of the weighted lever balance, causing it to fall on the disengaged end of the valve lever and thus open the outlet. As the water is discharged and the float falls, the fork from the other side turns the balance weight over again, thus closing the valve. The tank then fills for another discharge. The discharges are regulated by the supply cock, which may be set to admit more or less water according to the number of flushes required. The tank fittings are adapted to small tanks as well as large by simply bending the fork to bring the ends closer together. The tanks are furnished in cherry, ash, oak, maple and walnut.

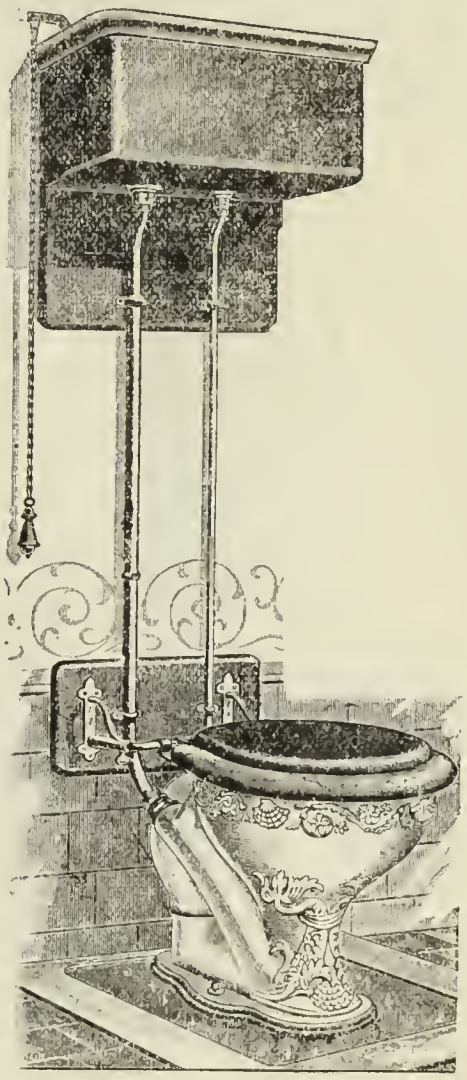
James M. Heatherton.

The many friends of James M. Heatherton in the plumbing trade will learn with regret of his death on March 20, at his home, 773 Monroe street, Brooklyn, N. Y. The funeral services will be held at the house at 1.30 p.m. to-day. Those who desire to attend should take the East New York elevated road at the Brooklyn Bridge and stop at Gates avenue station. Mr. Heatherton was born at Albany, N. Y., in 1841, and at an early age was apprenticed to Ridgway & Russ of that city, at the plumbing trade. He left their employ and opened a plumbing shop in New York in 1859, where his trade grew, and he at one time ran three shops at 159 Mercer street, 35 Ann street and at 1690 Third avenue. He continued in the plumbing business until 1887. Among his notable jobs was the plumbing in the Post Office Buiding, which is now being remodeled. In 1880 the *Plumbers' Trade Journal* was started and later occupied his whole time. Mr. Heatherton entered the late war as a private, but rose to the rank of colonel at its close, and was a member of a number of social and secret societies. He leaves a widow, three sons and four daughters.

SANITARY EXPERT THOMAS S. AINGER of Detroit has made his report to the Board of Health of Saginaw, Mich., and strongly condemns the sanitation of the court house and jail. The supervisors will be called upon to remedy the defects as speedily as possible.

The New Era Siphon Closet.

A new combination siphon jet water closet is shown in the picture herewith, and is called the New Era by the manufacturers, the John Douglas Company, 162–166 Poplar street, Cincinnati, Ohio,



The New Era Siphon Closet.

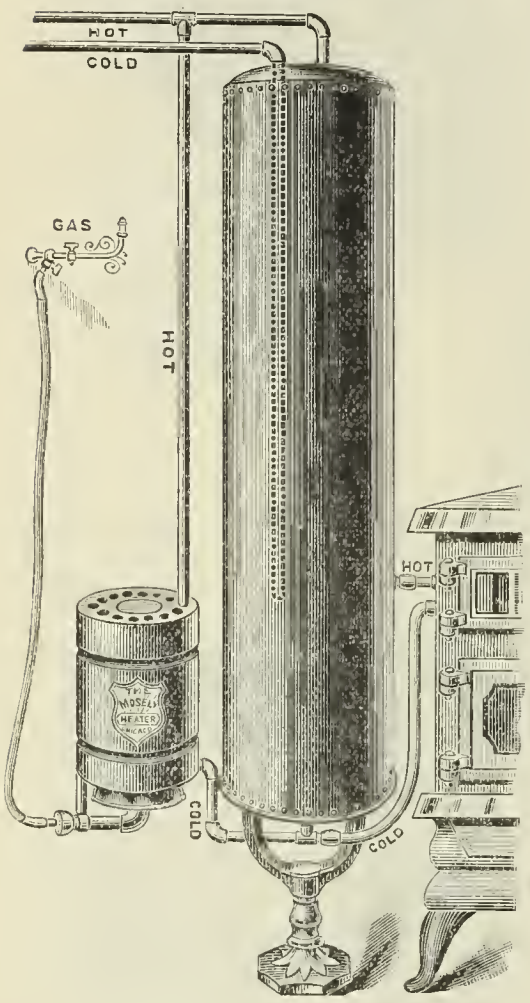
who also have a branch house at 131 Lake street, Chicago, under the management of Geo. L. Bottom. The closet is of ornamental design, and so constructed, it is claimed, that it works noiselessly, discharging its entire contents at once. The wood work in the seat, flush tank and bracket support is well finished and in a way to stand hard service. The seat and cover are detached from the closet and supported by means of brackets secured to the wall. For roughing in, 12½ inches should be allowed from the face of the wall to the center of the outlet of the closet. Every closet is tested and all the metal trimmings are nickel plated.

THE Board of Health and plumbers' inspectors of Cohoes, N. Y., held a joint meeting last week and adopted a set of rules and regulations similar to those in use in Troy. The rules were ordered printed in pamphlet form and published in the city newspapers. Following the joint meeting a meeting of the plumbers' inspectors was held and a committee consisting of Messrs. Bottum, Cady

and Swatling was appointed to draft by-laws, &c. The board also decided to visit the Troy Board of Plumbers' Inspectors and get an idea from them what was necessary to be done and have their duties defined.

The Mosely Circulating Water Heater.

The Mosely Folding Bath Tub Company, 161 South Canal street, Chicago, have brought out a new water heater, which is herewith illustrated. It is designed for use in connection with a range boiler, and is furnished with Mosely's improved gas, gasoline or oil burner, as desired. It contains 32 feet of copper coil. The illustration shows the method suggested for its use.



The Mosely Circulating Water Heater.

When connected in this manner the range or water heater can be used separately or at the same time. This method of connecting the heater affords the advantage of furnishing hot water at once and always drawing the hottest first. The manufacturers claim for this device high heating efficiency and minimum consumption of fuel. It is made in three styles of finish—polished black iron jacket, polished copper jacket and copper top, or nickel plated copper jacket and nickeled top and fittings.

THOMAS J. CUSACK has removed from Fair street to his former old store, 45 North Front street, Kingston, N. Y., which he is having thoroughly renovated and improved. The basement is being converted into a modern workshop, while the main floor or display room is undergoing decided changes. One section will be devoted to an exhibition of garden hose and another to steam and hot water ranges &c. A special feature will be one of the large show windows, which will be constructed and furnished like a modern bathroom.

Operation of Siphon Closets.

From S. C. P. C., *Sioux City, Iowa.*—Will *The Metal Worker* be kind enough to give a theoretical explanation of the operation of a siphon tank and closet?

Answer.—The various tanks in use have many different kinds of valves, all operating on the principle of using the pull to put the valve in operation. Water from the tank rushes down the flush pipe to the closet, and if the pull is released at once the valve will resume its seat, and water will be drawn through an inverted U-shaped pipe or some construction answering the same purpose by siphonic action, and will continue until the water in the flush tank falls below the end of the short leg of the siphon, when the flush will stop and the tank fill up until the supply is cut off by the ball cock used in connection. The water, on reaching the water closet, by its construction is made to thoroughly scour and flush the internal surface of the closet, while a jet enters at the bottom of the trap and shoots toward the trap outlet. The shape of the waterway from the trap to the soil pipe is so arranged as to create a spray and retard the flow of the water through it so as to flush and fill the waterway from the closet to the soil pipe. Then, through a larger surface of water being exposed to atmospheric pressure in the closet than there is at the soil pipe, a siphonic action is induced and continued until the contents of the closet have been disposed of and the siphonic action broken. This occurs before all of the water from the flush tank has escaped and the after flow seals the trap.

Burst Pipes.

A plumber corresponding with an English journal in reference to pipes bursting from freezing gives an interesting account of some experiments as follows:

For trial, any strength pipe would do, but for a simple demonstration, take about 20 feet of light ½ or ¾ lead pipe. Put a stop tap at one end and a bib tap at the other. Fill this pipe by a hose, shut the bib tap, then the stop tap tight, double the pipe with an easy bend, cut a hole through a wall into a warm room, then put the double pipe inside with the taps outside, and gradually draw them out about 1 foot at a time to allow them to freeze up from the taps, and by the time the pipes are nearly all drawn out the burst will take place in that part not frozen or last to freeze.

Again, take the same pipe, filled as before, and draw out one end only; the burst will then take place at the end not frozen or last to freeze close to the tap inside.

Again, take the pipe and fill it, then put the end with the bib tap inside. Open it, put a bottle or can to catch the water, and then draw out as before, and as it freezes it will push the water into the bottle, and no burst can or will take place on any part of the pipe swollen.

Again, take the same pipe as before, shut off both ends, expose it equally, all at once, to frost; no burst will take place, but the pipe will be slightly expanded.

The expansion caused by freezing is great, and will burst almost anything. Why? Because there is no vent or escape for the pressure of the water; but if a passage is kept open to the center, or the last place of freezing, no burst will take place, not even a bottle, if it could be attended to.

Take a simple test, as I have done—a water butt; let it freeze, and before it is half frozen it will burst the butt. But keep the center open with a small iron rod, and though it may get solid, it will not burst. Why? Because the hydraulic pressure is taken away.

Burst pipes are caused by expansion in freezing and forcing the unfrozen water between two given points, and by hydraulic pressure expanding the pipe until it is relieved by a vent.

It is on this principle that pipes are burst by the sudden stoppage with the old fashioned half turned taps. Hence the introduction of the screwdown taps. This I have experienced many times of old when the high pressure of town water was introduced. The burst in these cases is exactly like that by frost.

TRAPS AND VENTS.

REPRESENTATIVE REVELL has prepared, and will introduce into the Illinois Legislature at the first opportunity, says a Chicago daily, a bill to compel gas companies to supply to consumers prepayment meters. The prepayment meter is operated on the slot machine plan. The consumer drops a coin in the slot and a certain quantity of gas is produced. These meters are in use in some of the cities of Europe. It is estimated that if this bill becomes a law it will involve an expenditure for meters by Chicago gas companies of about $5,000,000.

THE PROPERTY of the Cleveland Gas Fixture Company was recently purchased in the Probate Court and will be operated by a new company to be known as the Cleveland Gas & Electric Fixture Company. The new company elected officers recently as follows: President, R. E. Gill; vice-president. Bernhard Schatzinger; treasurer, B. G. Tremaine; secretary, H. L. Taylor. The officers and L. Poplowsky constitute the Board of Directors.

DENNISON, OHIO, it is reported, has raised $30,000 and secured 20 acres of land which is to be used as an inducement to James B. Clow & Son, Chicago, to locate their pipe works there, their works at New Philadelphia having been destroyed by fire.

JOHN VAN DE VELDE has moved his plumbing and steam heating establishment to 27 East Third street, Dunkirk, N. Y.

B. P. CONNEALY has been appointed Pumbing Inspector at Waterbury, Mass.

JAS. F. DUFFY, 124 Main street, Hartford, Conn., has been fitting up his store in a handsome manner so as to display to the best advantage the fine plumbing fixtures, including porcelain tubs, marble lavatories, closets of various kinds and the accompanying nickel work. In the heating line he carries the boilers made by the American Boiler Company.

SINCE ZALMON GOODSELL has become president of the Builders' Exchange, Bridgeport, Conn., the membership has grown from 10 to 70, and the value of the exchange is being appreciated.

GEORGE H. FARRELL, Westfield, Mass., has repaired the damage done his plumbing establishment on Arnold street by fire, and is ready for business again.

THE CITIZENS' GAS COMPANY, Bridgeport, Conn., will establish a plant as soon as possible to supply fuel gas to factories and dwellings.

R. D. WALLACE AND H. J. PLOCK have arranged to open a plumbing, steam and gas fitting establishment in Seneca Falls, N. Y.

ALLEN & WARD, Athol, Mass., have made extensive alterations and enlargements at their plumbing shop in Cardany's Block.

THE PLUMBING SUPPLY HOUSE of Geo. D. Kimber & Co., Brooklyn, N. Y., sustained damage last Sunday night from water used on a fire in the upper part of the building they occupy.

F. J. STURN, Newark, N. J., has taken a store adjoining his plumbing establishment, which he will fit up as a showroom for gas and electric lighting fixtures, and will make a fine display of modern plumbing fixtures.

S. B. PARKER of Goldsboro, N. C., who has been running a plumbing and tinning business for 15 or 20 years, has opened a branch in New Berne, with headquarters on Craven street.

ACCORDING to newspaper report elec tric heat has been applied with success to the thawing out of frozen water pipes in England. A wire is run into the pipe until it meets the obstruction, and then the current is turned on.

E. L. POWELL, Atlantic Highlands, N. J., was a visitor at *The Metal Worker* office this week. Mr. Powell has invented several devices that have proven useful to the plumber.

C. H. ROLLINS is remodeling his plumbing store in Watertown, Mass.

PLUMBING INSPECTOR SIEBEN of Kansas City, Mo., has prepared a new plumbing ordinance. The old law contains some sections which, although good when written, are now said to be objectionable. A meeting of master plumbers took place last week to discuss the new ordinance. The two chief bits of contention were the proposed examination of plumbers as to qualification and outside sewer drains from the basement, with fresh air inlets, instead of a circulation pipe through the roof. It was voted to require the circulation pipe. At present the law requires a fresh air inlet on the soil pipe between the main trap and the house. It is claimed that the extension of a pipe or stack through the roof will vent vapors and stop a nuisance that the old system causes. Another interesting point is that of prohibiting unflushed vaults along the lines of the sewers. Health Officer Wsring contends that the thousands of unflushed vaults are the gravest menace to public health.

LE BLOND-MATTOON PLUMBING COMPANY have been incorporated at Sheboygan, Wis., with a capital of $5000. The incorporators are Sarah Le Blond, E. B. Mattoon and Emma G. Mattoon.

THE MASTER PLUMBERS of Cleveland, Ohio, met last week in the rooms of the Builders' Exchange and listened to the report of Daniel Roberts, chairman of the committee which represented the Cleveland organization at the recent convention of the master plumbers in Cleveland. The master plumbers desire to bring about State and national legislation which will establish uniform rates and methods for plumbing.

THE WHITAKER SUPPLY WORKS, Kokomo, Ind., manufacturers of plumbers' brass goods, have sold out to Henry Goelitz of Chicago, who will immediately double the capacity of the works.

AMONG the new plumbing establishments that have recently been established in Chicago can be mentioned the following: D. G. Monteath, 1558 West Harrison street; Thomas M. Joyce. 32 Pine street; John G. Henzel, 3506 Vincennes avenue; Mark Abrahams, 3456 Cottage Grove avenue; E. F. Anderson, 286 Western avenue; F. P. Gleason & Son, 12 Quincy street; Machalitzky & Loula, 885 Twelfth street; Levy & Son, 4009 State street; Henry Schmidt, 3463 Irving street; Wilson Sanitary Plumbing Company, 3341 State street; William F. Reinmeeth, 4849 Hoyne street

AT A MEETING, last week, of the Shuster Foundry Company, South Pittsburg, Tenn., F. H. Shuster of Philadelphia was elected president, and Joseph Lodge of South Pittsburg, vice-president.

THE CITY COUNCIL of Kokomo, Ind., has taken preliminary steps toward putting in an entirely new system of sewerage during the coming summer, which will provide employment for some hundreds of laborers.

"THE MONSON MAINE SLATE COMPANY" is the title of a neat brown covered pamphlet calling attention to the products of this well-known company, whose Boston office is located at 113 Devonshire street. The first pages give prices, with list of sizes and other particulars, of Monson Maine unfading black roofing slates. Then the company refer to their slate stone products for other purposes, such as urinal stalls, blackboards, wainscoting and capping tile, kitchen sinks, cisterns, laundry tubs, bathroom and vestibule floors, closet seat slabs, register borders, &c. Accompanying the tables are prices and likewise circulars, in which the company give further particulars of these goods.

ARTHUR F. MAYHEW has gone into the plumbing business and opened a shop at 5 Lowell street, Peabody, Mass.

E. T. FORD has opened a steam and hot water heating and plumbing shop at Hanover, N. H.

ROW & BENZ, plumbers, 258 South Ninth street, Reading, Pa., will dissolve partnership, and Mr. Benz will continue the business at the present place. Mr. Row will engage in the same business April 1 at 216 South Ninth street.

IN *The Metal Worker* of March 2 we announced the dissolution of the firm of Hughes & Stephenson of Montreal, Canada, and said that W. A. Stephenson retired from the firm. This may have given the wrong impression that Mr. Stephenson was going out of business. This is not the case, however, for he has leased the premises at 36 Victoria square, corner of Craig street, Montreal, Canada, where under the firm name of W. A. Stephenson & Co. he will carry on a general plumbing, heating, gas fitting, lead burning and electric business. In his announcement he states that he enjoys special facilities for purchasing goods from the leading manufacturers, and has in his employ skillful and practical workmen in the several branches.

N. S. & P. C. STEWARD, plumbers and steam fitters, have leased the Littlefield Building on Elm street, Skowhegan, Maine.

THE CITY COUNCIL of Springfield, Ill., have passed an ordinance providing for the supervision of plumbing and drain laying, for the registration of plumbers and drain layers, to define the powers and duties of city officers and the duties and obligations of registered plumbers and drain layers and to authorize the collection of fees for inspection.

Wade's Plumbing Specialties.

J. J. Wade & Son, 276 Dearborn street, Chicago, have just brought out a fine catalogue of J. J. Wade's plumbing specialties. Mr. Wade is a most progressive and enterprising plumber, with the happy faculty of putting his ideas in practical shape for the benefit of the trade generally. His inventions have been brought out from time to time and quietly placed on the market. They have been known to be quite numerous, but even those most familiar with them will be surprised to learn how wide a field they cover, as shown collectively in this catalogue. The contents begins with the Accessible sewer flushing fittings, the object of which is to make the sewer pipe for house drainage always accessible throughout its length, as well as capable of frequent flushing at traps and other points likely to be fouled. The fittings connected with this system are of great variety, to cover every possible requirement. Then follows the Wade patent sectional flushing iron catch basin, built in sections, which can be bolted together, making a basin of any depth desired. The frequent flushing idea extends to this device also. Next comes the Wade accessible flushing iron catch basin, adapted for boiler blow off, drainage, or for all purposas requiring tight basins. This is supplemented by a sink flushing grease catch basin ejector. Another important improvement is the Wade automatic cellar drainer, for removing water from cellars, excavations, wheel pits, &c., which is operated by water pressure. An illustration is given of the Wade lead burning system, to join the edges of sheet lead or lead pipe so as to resist the action of acids. Next follow lead lined iron ventilation, soil, waste and supply pipe and fittings. The concluding pages illustrate the Wade siphon jet water closet, Centennial pedestal closet, Purity washout closet, Columbian flush rim hopper, Delaware lavatory, Delaware secret waste basin, Delaware plug basin, automatic basin lock valve trap, Delaware lavatory plug basin, Purity basin, &c.

THE PHILADELPHIA STEAM HEATING COMPANY, 1513 Filbert street, Philadelphia, have the contract for placing an extensive steam heating plant in the Real Estate Trust Company's building at 523 Chestnut street. It will cost $6000. They will also put a $2000 plant in the St. Thomas parish school building at Eighteenth and Fernon street.

A FIRE STARTED in a neighboring planing mill destroyed the Baldwin Refrigerator Company's factory, Burlington, Vt., on March 19. The company's loss is reported to be fully covered by insurance.

GROUND has been broken at Tifton, Ga., for a new iron and brass foundry.

ROOFING AND CORNICE.

Berger Bros.,

231 and 237 Arch street, Philadelphia, have just issued what they claim to be the largest catalogue ever published in this country covering a line of tinners' hardware and roofers' supplies, pipe, pipe hooks and fasteners, furnace fittings and kindred goods. The catalogue contains 128 pages of heavy enameled paper, well printed and plentifully illustrated. Following the title page is an introductory announcement to the trade, in which the firm's appreciation of the patronage hitherto extended to them is expressed, as well as their intention to merit its continuance. Page 3 carries the terms under which they do business. The catalogue proper commences on page 4, which page with its follower is devoted to joint gutter. Next in order come miters and roof gutters, quarter circle, O. G. and box gutters. Gutter hangers follow, a large variety being shown. Page 13 and two following pages show Berger's new hinged shanks and circles, on which a patent is being sought. These shanks are claimed to combine great strength and variation, and allow the stems to hang close up to the cornice and the circles close to the shingles; several styles are shown, as well as suitable materials for their application. Trough and gutter hangers and fittings are next shown. Pages 20 to 25 are devoted to corrugated expanding, lock seam and spiral lock seam conductor pipe and fittings, and cast iron header shoes and sewer connections. Two pages are assigned to rain water cutoffs, filtering joints and strainers. Eight handsome designs of conductor heads follow, the designs being now published for the first time. Pipe fasteners and holders of all kinds occupy upward of eight pages. One page shows the B. B. pipe hanger, an entirely new article for use in a great variety of ways, above floor or under ceiling and side walls; it is said to be adjustable to any distance for single or twin pipes and is made in either plain or polished metal. Pages 38 and 39 show expansion bolts, stove bolts and rivets and burrs; and the two following pages cover sundry supplies and tools. Pages 42 to 66 are devoted to a general line of tinners' hardware, including ears, handles, shanks, rings, can screws and bottoms, knobs, stove turn buckles, roof irons and collar clamps; coffee pot and sad iron stands; lifters, lemon squeezer, valves and plungers, and speaking tube and fittings. Considerable space is awarded to sheet iron and zinc, corrugated sheet iron crimp roofing, pressed steel brick and rock face brick siding, roll steel roofing, continuous tin roofing, felt roofings, sheathings, asbestos felt, metallic paints, roofing and furnace cements. Pages 78 to 85 contain furnace fittings of all kinds, dampers being especially prominent. Coal hods, water buckets, stove shovels and pokers occupy two pages. Chimney ventilators and caps take up four pages; then follow galvanized iron ridgings; crestings, cresting blocks and finials are displayed on pages 94 to 111, many new and original designs being shown. Galvanized iron cornices next appear, succeeded by hot air registers. The remainder of the catalogue is devoted to tools and articles of a miscellaneous character. A feature of the book is the number of fine illustrations used, the smallest article being deemed worthy of pictorial representation. The catalogue is bound in stiff paper covers of dark green color, having the firm's name and address on the front, embossed in gold, their lines of goods appearing within a conqueror's wreath, also in gold. The back page bears the firm's well-known trade-mark contained within a scroll. The firm will distribute the issue only to such tinners, tinware manufacturers, roofers, plumbers and architects as apply for them.

FLASHINGS.

Powers & Williams, Streator, Ill., issue an eight-page circular calling attention to the line of goods which they manufacture and sell. The front page shows two styles of galvanized iron vases, while the next four pages show a number of different cornices, the dimensions and prices of which are given. The styles vary from the plainest kind of cornice to quite an elaborate construction. Other goods noted are crestings, skylights, chimney tops, window caps, &c.

A little memorandum book that will be useful for vest pocket purposes is issued by the Burdick Mfg. Company, manufacturers of roofing, cornices and skylights, who are located at 312–314 John avenue, West Superior, Wis. At the top of the blank pages are printed references to their business.

John Severding, Richmond, Ind., is making a new strap eave trough hanger which he commends to the trade. The hanger is very simple in design, and it is especially mentioned that it utilizes the narrow strips of galvanized iron and tin that have heretofore been thrown into the dump. The features of this new hanger are that it is particularly strong and substantial, being made of No. 15 hoop iron and wide strips. The cross bar is $\frac{7}{8}$ inch wide and a $\frac{1}{4}$-inch strap goes around the gutter. The upright on the roof strap is $\frac{5}{8}$ inch wide, while a $\frac{1}{4}$-inch strip goes through a slot at one end and is fastened with a rivet, and for this strip the galvanized iron or tin scraps are utilized.

Landell & Skelton is the name of a new firm at Fayetteville, Ark., organized to deal in roofing and cornice materials, &c.

The Wheeling Corrugating Company, Wheeling, W. Va., have just issued their catalogue D 169. It is a volume of convenient size, handsomely published, bound in dark blue heavy paper, and contains 112 pages. In an introductory note, referring to the quality of their product, they state that their corrugated sheets are made from the best quality of iron, while their rolled roofings are made from the best quality of steel, their pressed standing seam and V-crimped roofings being made of semi-steel. They state that they will not fill orders for this roofing of common iron, as it will not give satisfaction to their customers. The first goods noted are corrugated sheets. Illustrations are presented showing the style and size of the corrugations, and a few pages are devoted to directions for applying corrugated roofing to wooden framing. A variety of other corrugated sheets are shown. A new feature of the present catalogue is the steel roll and cap roofing with protected cleats, which is illustrated by a section of a roof showing the method of applying the sheets and their appearance when laid. With this are full particulars telling how to apply the roofing. Similarly steel roll and cap roofing with galvanized or outside cleats is illustrated and described. These are followed by other styles of roofing, pressed standing seam, V-crimped, &c. Among new goods are steel rock faced brick siding and steel stone siding, of which illustrations are shown. A few pages are devoted to their tin plates, of which they give a list of brands, sizes, &c. In the section devoted to conductor pipes there is shown corrugated square expanded conductor pipe made in 10-foot lengths, in addition to the others previously illustrated. Among the miscellaneous goods of interest to the roofing trade is the Rainbow rain water cut off, which is described as the best cut off made. Following these are shutters, eave troughs, hangers, &c. A new chapter in the catalogue of the Wheeling Corrugating Company is devoted to malleable crestings and finials, of which many pleasing designs are shown. Galvanized cresting blocks, hip caps, finials and vanes are likewise illustrated, the whole covering over 20 pages. Skylights with frames of galvanized steel or copper are illustrated, and a number of sections of crown moldings and raised moldings are presented. Following a section on cornices and miscellaneous goods comes a chapter devoted to their patent continuous steel ceilings and side wall finish, of which some new and very handsome designs are shown. At the end of the volume is an alphabetical index.

We are advised that the Old Bangor Company of Bethlehem, Pa., have joined the new organization, known as the Bangor Roofing Slate Manufacturers' Association, to which reference was made in our issue of last week. Thus all the manufacturers of genuine Bangor roofing slate are now united, and the maintenance of a uniform scale of prices in the trade will be secured.

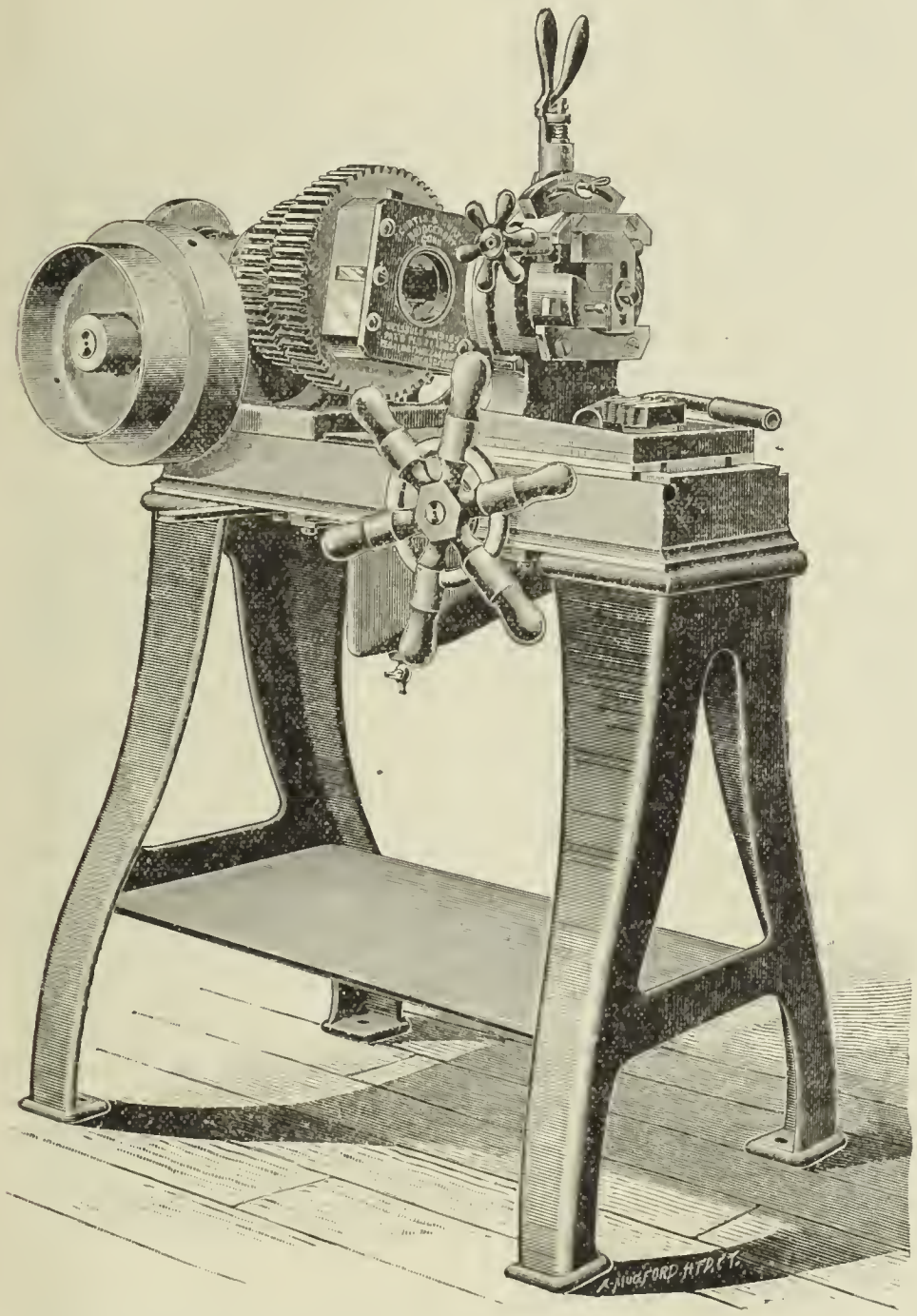
The plant of W. H. Mullins, Salem, Ohio, manufacturer of sheet metal and statuary work, is being equipped to burn oil by the system of the Thurman Fuel Oil Burner Company of Indianapolis, Ind. The furnaces, which will be used to anneal copper and zinc and to melt lead and zinc, will be 50 x 11 feet in size. Waste heat from the melting pots will heat the copper and annealing furnaces.

THE LATEST souvenir that has been issued by Gummey, Spering & Co., Philadelphia, is a most serviceable rule, and one that will be most appreciated by architects, for whom it is specially intended. The rule, of celluloid, is 12 inches long, folded in the middle. The advertisement is very simple and merely calls attention to Pennsyl Old Method, described as the finest quality of American roofing tin, and the Alderly brand is spoken of as a very choice quality of heavy coated roofing tin. The rule, which as mentioned is particularly for architects' use, is divided into 12 inches and along each edge the divisions are made for different scales. On one edge is the $\frac{3}{4}$ inch to the foot scale, together with the ordinary even scale of 12 inches. On the other edge are two scales, one $\frac{1}{8}$ inch to the foot and the other $\frac{1}{4}$ inch to the foot. These are the common scales in use, and the rule is so plainly marked that its usefulness will be apparent to every one who is the fortunate obtainer of one.

A circular has been issued by the Scottish Iron and Steel Workers' executive to all trades unions in Great Britain connected with this industry suggesting that a conference of delegates should be called within the next three months to consider the question of home and foreign competition in the iron and steel trades, with a view to devising measures for the maintenance and stiffening of prices.

No. 20 Power Pipe Machine.

To meet a demand for a machine in which when the pipe revolves the dies are stationary, Curtis & Curtis, Bridgeport, Conn., have designed and placed on the market the machine herewith illustrated. A special feature to which the manufacturers allude is that all parts are made interchangeable so that duplicates can be readily secured. The gears are all cut from the solid block, and all working parts, it is stated, are finely finished to gauge. To operate the machine, the pipe to be cut off or threaded is run through the hollow spindle of the machine from the left, passing through the self-centering gulde chuck shown at the left of the spindle and the self-centering vise at the right, and the die head. The pipe is then clamped by turning the screw in the vise, which not only clamps the pipe, but brings it central with the dies; by turning the hand wheel shown on the front of the machine the die head is moved so that the cut off tool comes opposite the point on the pipe where it is desired to cut, and can there be clamped in position. The back stop shown on the right side of the die head is run down over the pipe, and the pipe cut off by turning the wheel on the side of the die head. All this cut off arrangement is self-contained and allows a movement within ways, so that if the pipe should be slightly bent or out of round it would move with it, and thus facilitate the operation. Should it then be desired to thread this end of the pipe, the lever shown on top of the die head is thrown over to the proper graduation on top of the machine, which brings the dies to the standard size for the size of pipe to be cut. Should there be found that the fittings to be used varied from the standard, the proper allowance can be made with this lever so as to cut over or under standard size. Should there be a number of pieces of the same size to be cut, as in making nipples, the block into which the lever engages can be set to size and the lever simply snapped back into it each time without resetting. This feature is of particular value where the machine is operated in a dark room or where unskilled labor is employed. The die-carrying head is then advanced by turning the hand wheel shown on the front of the machine, operated through a rack and pinion under the die head, and the dies lead on to the pipe. When the dies have advanced as far as desired the top lever is thrown back, which frees the dies from the pipe, the die head is drawn back and the pipe is removed without running back over the thread. This machine is arranged with two sets of gearing for rotating the spindle and pipe, each of which is adapted to give a different speed to the machine. A change of speed from one to the other is obtained by simply moving a convenient lever while the machine is running at full speed and without being obliged to stop. This feature, it is said, will be found of special value in changing from threading to cutting for where a higher speed is desirable. With a change of belt speed on the cone four speeds of machine are obtained. When desired the machine is fitted with a hand wheel which is attachable to the cone shaft, thus allowing the machine to be operated by hand power. Solid pipe or bolt dies can be used with this machine when desired.



No. 20 Power Pipe Machine.

United States Consul Bruhl, at Catania, Sicily, suggests to the State Department what he considers may be a good opening for American trade in that island. It is for the building of small frame houses of from three to five rooms, such as we usually term cottages, which can be shipped from this country for eventual erection in Sicily. Mr. Bruhl is led to the belief that this industry could be established and carried on profitably from the fact that in that country the frequent earthquakes damage and destroy the houses erected there, the builders not being sufficiently advanced in the building art to be able to meet the demands in their construction. Relying on the superior facilities of the American builder and the workmanship that would be used, the consul is convinced that the people there would readily adopt the American structures, as better calculated to resist the frequent shocks. He has interested himself in the subject to a considerable extent, and is anxious to obtain illustrated catalogues and other information from American manufacturers and builders to lay before the Royal Earthquake Commission, with a view to having the experiment tried.

TIN PLATES.

The Proposed Restriction of Welsh Tin Plate Production.

The close of the present month promises to prove a period of critical importance in the Welsh tin plate trade. On March 31 expires the term of the arrangement whereby the men at a number of the works in South Wales agreed to accept a temporary reduction of wages, averaging about 12½ per cent. When this agreement was arrived at the manufacturers were in hopes that an improvement in business might occur in the interval and that prices might advance to a more profitable level. Neither of these expectations has been realized. Business has, if anything, declined in volume, mainly on account of the slackness in the demand for tin plates from this country, and prices have dropped from 3 pence to 6 pence a box. Consequently the makers are in an even worse position than they were at the opening of the year, and are now in no condition to restore the old wage scale. The men on the other hand seem disinclined to a continuance of the present scale of payment unless their working time is reduced. According to the latest advices from the other side, the two interests are endeavoring to agree on a compromise. But the obstacles to any arrangement which will be agreeable to both the employers and the Tin Platers' Union are said to be considerable.

It seems to be generally conceded that a restriction of output is imperative. Judging by the business done last year, the productive capacity of the active Welsh works, even if limited to 36 boxes a turn per mill, exceeds the present average demand to the extent of about 100,000 boxes a week. This represents the surplus production which, accumulating, gluts the market and causes constantly falling prices. To avoid this evil, the newly formed Board of Control in the tin plate trade, composed of a number of the leading manufacturers, has suggested that in order to assimilate the make to the demand, production should, after March 31, be reduced one-third of the capacity throughout the entire number of mills. To make this rule effective it is proposed that every third week should be a "stop week."

This proposition has received the approval of a large number of the makers and, in principle, is favorably considered by the union. The main obstacle, however, to its general acceptance lies in the fact that the manufacturers who are most strongly pushing the plan happen to be those who at one time or another have been connected with tin plate ventures in the United States, and an impression has got abroad among many of the makers as well as the men, that these persons are not working for the best interests of the Welsh trade. As, however, nearly all of them are stated to be no longer financially connected with the American industry, the prejudice seems to be somewhat unreasonable; still, it exists, and as Welshmen are notoriously tenacious of a once formed notion, the impression is regarded as likely to operate against harmonious action on this line.

The executive of the Tin Platers' Union have meanwhile issued a manifesto to the tin plate workers of South Wales, Monmouthshire and Gloucestershire, in which they approve the plan for the proposed assimilation of supply to demand by the stoppage of one-third of the capacity throughout the trade provided the men divide the work. "Employers of standing," runs the circular, "agree that this is practicable, and further contend that the action proposed will have the effect of advancing prices, and while we will be no party to secure artificial prices, which may encourage American competition, we submit that it is as much your duty to help employers to get fair prices as it is for yourselves a living wage. We welcome the assistance of employers and trust that few will be found so inhuman as to oppose this solution of our unemployed difficulty and their folly of having to sell plates under cost; but we wish to make it clear that our hopes and reliance rest upon tin platers realiz'ng in due time their best and truest interests. Wage reduction agreements terminate at the end of March. You will be tempted to extend these arrangements. We ask you on no condition to do so unless your employers contract with you to permit two-thirds time being worked. If a successful stand is thus made, in all likelihood the standard wage rate will be yours within a short time and you will agree that to work six hours' shift with a full wage-rate is better than working eight hours' shift with 12½ per cent. reduction. . . . Your executive in this way opens a course before you, which, if followed with the determination and enthusiasm characteristic of tin platers, will aid in removing misery and suffering, restore uniformity of conditions and do away with that mad competition destructive to the employer and intolerable to the tin plate workman."

A further conference between the manufacturers, represented by the Board of Control and the representatives of the union, is to take place, it is understood, before the end of this month, when strong efforts will be made to arrive at a basis of agreement. Want of sympathy with promoters of the present movement on the part of a large number of people in the trade is thought, however, to be adverse to any effective joint action. A strong party is said to be still desirous of raising the price of plates to a basis of 10 shillings and 6 pence or 11 shillings a box, while others again propose that by mutual concessions on the part of employers and employed, the former contenting themselves with no profit and the latter accepting a further substantial reduction in wages for a fixed period, the price of plates might be reduced so low as to practically kill American competition. Both these schemes are regarded, however, as unworkable in effect, and except for the prejudice in regard to its source, before mentioned, the proposition offered by the Board of Control seems to be the only one that would command the assent of a majority of the makers and workmen.

SCRAP.

Two of the black plate mills recently built by Ætna-Standard Iron & Steel Company, Bridgeport, Ohio, have been put in operation, the first black plates for tinning having been rolled on Thursday morning, the 14th inst. Two others are about ready, and are expected to be rolling black plates within the next two weeks.

The Whitaker Iron Company, Wheeling, W. Va., have started up four sheet mills which have been idle for the past six or eight weeks. Two other sheet mills in this plant, which have been working right along, have been closed down.

The tinning department of Meurer Bros. Company's works, 575–577 Flushing avenue, Brooklyn, which has been closed down for alterations and repairs, will start again into full operation on Monday. Messrs. Meurer report a good demand for their various brands of American tin and terne plates.

The machinery has all been received and is now being placed for the new works of the National Tin Plate Company, North Anderson, Ind. It is announced that the works will be in operation by May 1. When completed they will employ some 750 men.

The Anderson Foundry & Machine Works, Anderson, Ind., shipped last week three carloads of tin plate machinery to the new plant of the Monongahela Tin Plate Company, Pittsburgh, and one carload to that of the Great Western Tin Plate Company, Joliet, Ill.

The tin plate plant of the La Belle Iron Works, Wheeling, W. Va., is fast approaching completion. The machinery is being installed, and it is expected that the works will be in operation by May 1.

The Board of Trade, Beaver Falls, Pa., has succeeded in raising nearly the whole of the $20,000 bonus for a new tin plate mill, which it is proposed to locate at that place.

The Washington Improvement Company of Washington, Pa., a concern who have been organized and chartered for the purpose of promoting the location of industries at that place, have, it is said, practically closed arrangements for the establishment there of a large tin plate mill.

Wheeling Corrugating Company, Wheeling, W. Va., have started up a couple of stacks in their new tinning plant. The company purpose making both charcoal and bright tin, as well as roofing plates. According to their latest catalogue, just issued, the firm are making two brands of high grade hand redipped ternes, the Margaret and the Nelson, and two brands of rolled, full coated roofing plates, Elea-

nor and Wylie; besides three grades of bright charcoal and one brand of coke plates. They are also manufacturing and offering to the trade continuous roofing plates in their various brands, as well as flat seam tin roofing and tin valleys and gutters. In this manner they expect to consume a part of the output of their tin plate department themselves. The agent of the Wheeling Corrugating Company in New York City is H. C. Mechling, 81 and 83 Fulton street. They have also branch offices at Chicago and St. Louis.

F. A. VINAL, dealer in tin plate, sheet iron and metals at 124 Purchase street, Boston, Mass., has recently begun importing two special brands of terne plates, namely, Allston and Gem, which he is offering to the trade of New England.

THE FAMOUS Botallock tin mine in Cornwall, after being worked for over 200 years, is about to be closed, either permanently or until times are better, as it does not now pay to operate it. The Botallock is one of the most famous and frequently visited mines in the world on account of its picturesque situation near the wild Cornish coast and the remarkable engineering features connected with it.

THE MEN employed in the black plate mills of the Monongahela Tin Plate Company, at Pittsburgh, have been organized into the Amalgamated Association.

THE BRITISH BOARD OF TRADE returns for February show a large falling off in the shipment to the United States of black plates for tinning. They were only 451 tons, as against 2277 tons in the previous month. This is probably due to the large increase in the number of American mills producing these sheets which have come into operation since the beginning of the year.

GUMMEY, SPERING & Co., Philadelphia, advise us that they have not shut down their tin plate plant a single working day during the past quarter, such has been the demand for their brands of American tin and terne plates, many of which have become well known and appreciated among consumers. They call attention to a new brand of best bright coke plate, Champion, which they are now offering to the trade.

AMERICAN SHEET IRON COMPANY, Phillipsburg, N. J., are arranging for the addition to their plant of a second black plate mill.

Salt Lake Supplied with Natural Gas.

Salt Lake, Utah, is rejoicing over the final arrival of natural gas, which has been piped from the wells 14 miles distant. The completion of the first connection was celebrated by the illuminating of the main streets with flambeaux turned on at high pressure from the mains at the Temple Block. The supply is brought to the city by an English company and will be connected with the mains of the local gas company, who have contracted to supply a number of large local manufacturers and city consumers at a price low enough to displace coal as a fuel. The wells already improved have an aggregate output of 20,000,000 feet per day. The supply already available is ample for the entire demands of the city for domestic light and heat, with a good surplus for manufacturing purposes.

Capital and Confidence.

In business circles the one achievement which is devoutly hoped for, says *The Iron Age*, is a restoration of confidence. We find that a good many merchants and manufacturers interpret that phrase as a recovery of sufficient nerve among buyers to place more liberal orders, for more extended delivery. We believe that a deeper search will reveal that a sense of security on the part of capital is the most important influence bearing upon it. If that be true, then it needs much to overcome the disastrous effects of the developments of the past two years and the influence of current contentions. A review of recent industrial and commercial history appears to show that success could not have been more complete if the deliberate aim had been to frighten moneyed men into inactivity. Capital is proverbially timid, although it has its spells of reckless courage.

Whatever may be the merits of the questions involved in the great battle of the standards, this one fact will be hardly disputed, that the great majority of moneyed men are either uncompromising "gold bugs" or believe in bimetallism only when it is backed by the unqualified support of all civilized nations. So long as such men see before them the danger that power may pass into the hands of legislators representing what to them are crazy views, capitalists will keep their money idle.

It is curious that the same men who will resort to cajolery and to every means of persuasion to win the confidence and good will of capital when they want it for their own individual use and profit, believe that the best instrument of conviction against capital collectively is the club. The same men who rush to financial centers to secure money for the development of the resources of their native States and Territories at home make ringing speeches against the Shylocks. They recognize the power of money and yet attempt to overawe and domineer capital.

When business men, who ought to know better, resort to such bulldozing tactics, it is not surprising that workmen, piloted by their walking delegates, do the very acts which must prolong the sufferings against which they rebel. Every unreasonable strike, every act of violence, discourages enterprise and drives into the financial centers money, the employment of which would mean work for the idle and the needy. So long as no power exists to force capital into the channels of industry injustice and violence on the part of those who work for their daily bread must react upon them.

There is another very serious cause for the timidity of capital, be it foreign or American, which should be frankly exposed, and that has been the laxity of business principles which has widely prevailed. The course of the managers of some of our great railroad systems now in the hands of receivers has been outrageous. The deliberate falsehoods uttered on the eve of failure have shocked that large class of security holders who may pardon a loss but never forget deception. The stock-jobbing on the part of officials, the juggling with accounts and the manipulation of corporate interests for private gain are scandals which have discouraged the flow of money into channels into which they went freely for many decades.

Revival can only come when conservative capital has become convinced that the lesson of the past few years has been thoroughly learned. A speculative spirit can only develop after continued moderate successes have made the timid venturesome. The vast majority of the born speculators and boomers have nothing but the memory of past financial greatness left to them. The men of large means and solid wealth will be the first to seize the many opportunities for successful operations. But they, too, are the most cool headed, the ones who can afford to wait patiently, the ones who cannot be bulldozed, but must be convinced by clear evidence that irresponsible and dishonest attacks upon capital have ceased.

Furnace Fittings.

The Excelsior Steel Furnace Company, 38 West Monroe street, Chicago, have made an important reduction in their price of Furnace Fittings. They are enabled to do this by the lower cost of material, thus giving their customers the benefit of the decline which has taken place since last season. They are now quoting 50 and 10 % discount on the old list, and in addition allow full freight to points east of Omaha and Kansas City on orders of $10 or over, provided payment is made within 30 days by remittance in New York or Chicago exchange, accompanied by railroad expense bill. No charge for cartage or crating on such orders. Orders of less than $10 subject to charge of 50¢ for cartage and crating; 2 % extra allowed on bills paid in 10 days. Equally important reductions have been made on their entire line.

The late G. T. Simonds of Fitchburg, Mass., gave the last years of his life to the development of ball bearings. An English company are bringing out his patents abroad. Among them is one to which Mr. Simonds attached much value, and that is the method for hardening the balls after they had been rolled. The object to be hardened is plunged first into brine and afterward into oil. This by itself is not new; but the novelty consists in the manner in which it is done. It is desirable that the object to be hardened should remain for a certain number of seconds in each of these fluids, and that it should pass from one to the other without coming in contact with the air. This is effected by making the bath double, the partition in the middle not extending quite to the bottom. It is then half filled with brine, on the top of which oil is poured on one side only. An endless chain fitted with wire buckets enters the brine at one side of the bath, and passing under the partition, comes out through the oil. The rate at which this chain is driven being decided and the depth of brine and oil regulated accordingly, it is evident that the objects in the wire buckets will remain immersed the exact time required.

THE WINDOW GLASS manufacturers from all over the United States met this week in Pittsburgh and formed a pool to be known as the National Association of Window Glass Manufacturers, whereby they will regulate prices and place the industry on a more profitable basis. The Indiana manufacturers after the general meeting met and advanced prices from 10 to 15 per cent. This action will, it is said, be made general shortly.

STOVE TRADE NOTES.

The Ohio Stove Trade.

Reports from stove manufacturers, in the main, are encouraging, but they are not uniform. A few producers are in the slough of despondency, judging from the tone of their communications, but these advices are from a small section, where the general improvement, so noticeable in other terrltory, has not been felt. Throughout Ohio and many parts of Indiana, however, come most encouraging reports, the first quarter of the year 1895 showing an increase of 50 per cent. in sales over the corresponding time a year ago, and even comparing favorably with the trade of two and three years ago. One manufacturer writes that business in stoves has been double that of a year ago, and, further, that his company are booking more orders for future delivery than ever before.

But while there is little room to doubt that the volume of business is increasing, it is equally true that profits are not increasing in the same proportion, but this cannot be expected by thoughtful business men.

Not a few stove founders have been farsighted enough to cover probable needs for pig iron by purchasing supplies for delivery during the next few months, thus protecting themselves against any advance in prices which the present buying movement of pig iron may create. Up to the present tlme, however, the pig market has been in favor of consumers, and the advance anticipated by furnaces has not been realized, but the indications at the moment are certainly for a hardening market.

Industries other than stove foundries dependent largely upon iron in this section are improving decidedly, and the activity previously noted in the money market continues. Loans of the Cincinnati banks have been expanded over $1,500,000 during the first quarter of 1895, while deposits have increased only about $500,000, and now country banks are drawing upon their balances quite heavily, and in addition are borrowing funds, indicating activity in the rural districts.

THE SYRACUSE STOVE WORKS, Syracuse, N. Y., have in the Kernan Welcome range a very attractive six-hole stove, which embodies the results of years of experience both as regards ornamentation and constructive features. The range has large fire box so arranged that the grate pulls out through the front opening without disturbing the water back or brick, capacious oven and Duplex Dockash or plain flat grates, as may be desired. The sheet flue is of good size and the stove is guaranteed a quick baker and worker. The hot air for the upper rooms is drawn from the base and rear of the range without interfering with the water back or baking qualities. The Kernan Welcome is offered in two sizes, portable form and brick set.

Settlement of the Trouble at the Southern Stove Works.

The differences existing for some time past between the workmen and the management of the Southern Stove Works, at Evansville, Ind., have been adjusted and it is expected that matters will now run along to the satisfaction of all concerned. A brief account of the trouble and the settlement is contained in the issue for March 10 of the Evansville *Courier*, being an interview with August Brentano of the firm of Kiechle, Brentano & Oberdorfer, proprietors of the Southern Stove Works. In this interview Mr. Brentano says:

The firm closed their works in December, as they usually do for some time during that season. Early in January many of the employees went to Mr. Brentano and desired him to commence work again. He then called together 30 of his most skilled workmen and said: "Now, you can all go to work if you will not interfere with other men who make all kinds of stoves." They agreed not to and we commenced operation again. After we had been working for about two weeks we received an order for a Franklin stove from New Mexico. Several pieces were missing and the foreman gave orders to have them made. As soon as the workmen commenced work on them the 30 men stepped up to him and told him he must desist. There's where the difference originated. In the first place, there was no walk out; there was no lock out; there was no strike. All but 11 of the molders that were working for us were discharged by the foreman of the molding department, through the firm, for not obeying orders in regard to the discharge of some work they were told to do.

It appears that there is a certain make of stove called the Franklin that is termed a "strike" job when union men are forced to work on it. On Saturday, when the men were asked to commence work on that make of stove, there was wrangling at once. Some said they would quit that night—in fact, all but 25 said they positively refused to obey the orders of the foreman. On the following Monday all of the men reported at the molding room for duty. The question was again asked them if they would work on the stove and all but 11 refused. The foreman at once told those who would not follow instructions to take their tools and leave the premises at once, which they did.

My next action was then to advertise for non-union molders. They soon came from all over the country. The union men living here captured them, however, on their arrlval, and after intimidating them paid their way out of town again. I finally had quite a large number of molders together, however.

In the mean time the union men were continually harassing the 11 union men in our employ and their families also. They even went so far as to "do them up" and scared their families. The men were true to me as long as they could be, and then for fear of their welfare and their wives and children they went out also. I desire to say right here that those men are still in possession of their union cards and will go to work for me on Monday morning.

I finally had nothing but non-union men. This continued so until Monday of this week.

On Monday G. F. Valentine of San Francisco, Cal., vice-president of the International Molders' Union of North America, came to me and introduced himself and related to me his official posltion, and asked for an interview. It was granted.

At the interview he asked me if the matter could not be arbltrated. I told him the firm were tired of the unfairness shown them by the local unlon; that this trouble had been continuous for the past seven years. We have adhered to the local union as close or closer than any manufacturer here, and we have had the most trouble and we are tired of it—thoroughly disgusted with being dictated to by our employees. However, I found Mr. Valentine a courteous gentleman, and it was not as difficult as I at first supposed lt would be to adjust our differences.

The matter is now settled to the firm's satisfaction in every detail. You may say in your valuable paper that the firm are in far better condition in regard to our rights and privileges in our works than we were before the strike occurred. We now know what we are doing. Heretofore our employees run our business, and hereafter we will run it ourselves and to suit our own fancy and in accordance with the new management.

You might add that we will have nothing to do whatever with the local union. Our contract is made solely and directly with the International Molders' Union of North America.

You can say in your paper that the firm's boarding house at the manufactory was closed Friday night, and that the union men have paid all the non-union men's transportation out of the clty or taken them into the union.

The union force will work for us, commencing Monday morning. I engaged 50 molders to-day, including the 11 who stood by me in time of need. There is no reason why these men should not continue their work, as Mr. Valentine admitted to me that the men, our employees, alone were in the wrong.

We have gained a decided vlctory, and our firm are thoroughly satisfied with the present arrangements.

STOVE MANUFACTURERS who have pattern making departments of their own will probably be interested in a new rotary wood trimmer which the Hess Trimmer Company, Twenty-fifth and Callowhill streets, Philadelphia, are

putting on the market. It is said to trim very wide work, accommodate material as thin as $\frac{1}{64}$ incb, and to possess numerous other advantages. The company have published a circular explaining the machine in detail.

S. M. Howes.

The New England stove trade recently lost a valued member in the death of S. M. Howes, which occurred Sunday, March 10, after a lingering illness, at Rockland, Mass. Mr. Howes was a native of Dennis, and while a young man went to Methuen, where he learned the tinsmith trade. In 1872 he established himself in the stove and tinware business in Rockland, where he continued for seven years. He then engaged in business in the city of Boston, and for a period of 15 years was at the head of the S. M. Howes Company, well known to the trade of the country, and especially throughout the New England States, as wholesale dealers in stoves and heating apparatus. A fully attended meeting of the Wholesale Stove Dealers' Association of Boston was held on the afternoon of Monday, March 11, at the office of the Walker & Pratt Mfg. Company, Boston, to take action upon the death of Mr. Howes. A Committee on Memorial Resolutions was appointed, as well as a committee to attend the funeral at Rockland on the afternoon of Tuesday, March 12. Mr. Howes was born 44 years ago. A widow and three children survive him. The funeral services were conducted by Rev. A. L. Wadsworth of the Baptist Church, music being rendered by a quartette. The remains were taken to Abingdon, where they were interred in the Mount Vernon Cemetery. Among those in attendance at the funeral were the directors of the Rockland National Bank, trustees of the Rockland Savings Bank and the committee from the Wholesale Stove Dealers' Association of Boston. Out of respect to the memory of Mr. Howes all the stove and hardware stores on Union street, Boston, were closed between two and three o'clock on the afternoon of the funeral.

The Manufacture of Furnaces in Syracuse.

We have received from E. C. Moses, assistant secretary of the J. F. Pease Furnace Company, Syracuse, N. Y., a letter in which he makes reference to the article printed in a recent issue of *The Metal Worker* respecting the manufacture and sale of furnaces in this State. Mr. Moses' letter, which explains itself, we present in full below:

Our attention has been called to the statement made on page 49 of *The Metal Worker* of March 9 in an article written by William H. Landers of this city, on "The Manufacture and Sale of Warm Air Furnaces in New York State." The statements refer to a comparison of the production of warm air furnaces in the several cities of the State of New York. Syracuse is set down as producing 2500 in an average year; Utica 8000, &c. As the estimate is preceded by the statement in which the writer says that it is made merely from observation, we do not suppose the comparison should be taken seriously by those who understand and know the relative production of the two cities. However, to correct an impression which may have been gained from the article and to set Mr. Landers right, we would state that Syracuse produced in 1890, or in any subsequent year, far more than 2500 furnaces; in fact, the J.F. Pesse Furnace Company alone have produced far more than that number. We think it would not be overestimating this city's production to state that fully 5000 furnaces are easily manufactured annually. There are, we believe, six or seven wide-awake manufacturers in Utica, and it is quite probable that they produce together from 5000 to 8000 furnaces. There are only three manufacturing concerns of this character in Syracuse. These three concerns are by no means insignificant in the production of furnaces. If the statement referred to heating apparatus in general we would, witb the help of our house heating boiler manufacturers of this city, roll up some figures which would be interesting if not preponderating.

Cupola Tuyeres.*—VI.

BY DR. EDWARD KIRK.

Number of Tuyeres.

A cupola may be supplied with blast from one tuyere placed on one side of the cupola, but the objection to one tuyere arranged in this way is that the heat is driven by the blast against the opposite side of the cupola, and the destruction of lining at this point is very great. For this reason, at least two tuyeres are always placed in a cupola, and they are located on opposite sides so that the blast will meet in the center and be diffused through the stock. When a greater number of tuyeres than two are placed in a cupola they are located opposite each other and at equal distances apart to admit an equal amount of blast on all sides and prevent an uneven destruction of lining from the heat being forced unevenly against it by the blast. Any number of tuyeres desired may be placed in a cupola, and as high as 100 have been used in a 40-inch cupalo and a greater number in larger cupolas. But these large numbers have given no better results in melting than two or four tuyeres in the same cupolas. It is not necessary to place a large number of small tuyeres in a cupola to distribute the blast evenly to the bed, and it is not advisable to put in small tuyeres, which are easily closed by the fuel, cinder and iron, and are oftener rendered useless than large ones. Better results are obtained from large tuyeres and fewer of them.

The largest cupola in use may be supplied with blast by two tuyeres if they are big enough. The large cupola of the Buffalo School Furniture Company, Buffalo, N. Y., is supplied with blast by two tuyeres 12 x 18 inches, placed on opposite sides. This cupola, which is 60 inches in diameter inside, does excellent melting with only these two tuyeres, and the destruction of lining in melting is very light. I saw a large cupola with two tuyeres of about the above dimensions in use in a stove foundry in St. Louis, Mo., about 20 years ago, and it did excellent melting. The results obtained from these two cupolas would go to show that there is nothing gained in distributing the blast to the bed evenly by a large number of small tuyeres. When a number of tuyeres are placed in one row every other tuyere is sometimes placed about the width of the tuyeres higher than the tuyeres on either side of it. I have, however, never observed that anything was gained in melting by placing tuyeres in this way. When a double row of tuyeres is used the upper row should be made very small in comparison with the lower row, for if they are made of the same size as the lower row, or even half the size, and the two rows are placed at any great distance apart the heat is so concentrated upon the lining between them that it may be burned out to the casing in one or two heats. Foundrymen using the double tuyeres, who find the destruction of lining very great, may prevent it to some extent by reducing the size of the upper tuyeres.

*Copyrighted, 1894, by Edward Kirk.

Shape of Tuyeres.

The shape of a tuyere has nothing to do with the melting, except as it may tend to prevent bridging or increase the depth of the melting zone by supplying blast to the fuel at different hights in a cupola. A small horizontal slot tuyere extending around a cupola, or the greater part of the way around it, tends to promote bridging, and it is generally conceded that a cupola with a tuyere of this kind cannot be run for a greater length of time than two hours without bridging and clogging up. Vertical slot and reducing tuyeres supply blast to the bed at different levels and increase the depth of the melting zone the same as the double tuyere. For this purpose the Truesdale, Lawrence or triangular tuyere, with elongated sides, are excellent tuyeres when made of a proper size and placed a proper distance apart. When it is not desired to admit the blast to the bed at different levels the flat or oval tuyeres are generally considered the best shapes, for they admit the blast freely, and a less amount of fuel is required for a bed with these shapes than with a round or square tuyere of the same area.

Tuyeres to Improve the Quality of Iron.

All kinds of fancy shaped tuyeres have been placed in cupolas to improve or change the quality of iron in melting; they have been placed to point up, point down, point across each other at certain angles and to point to the center of the cupola. There is nothing more absurd than to attempt to improve the quality of iron in a cupola by the shape or angle of the tuyeres. The instant the blast leaves the mouth of a tuyere it strikes the fuel in front of it. The shape or angle given to it by the tuyere is then instantly changed, and it passes through the crevices in the fuel until its oxygen enters into combination with the carbon of the fuel and produces combustion; it then escapes at the top of the melting zone, where it comes in contact with the iron as carbonic acid gas. This is the result, no matter what the shape or angle of the tuyeres, if a proper amount of blast is supplied. It may be claimed that the blast acts upon the iron as it drops through the fuel in the bed after being melted, but as before stated, the shape or angle given to the blast by the tuyeres is changed by the fuel, and the effect on the iron of the blast from one tuyere would be the same as from another.

Tuyere Boxes.

The tuyeres may be and are often formed in the lining of a cupola when laying the brick, but this is a very poor way of making tuyeres, for there is nothing to support the brick and maintain the shape of the tuyeres, and they are often broken or burned away until there is no regular shape to the aperture, and it is difficult to put the blast into the cupola at the point desired or to prevent iron or slag getting into the tuyere. Tuyeres are more generally

formed with a cast iron lining or tuyere box, having the shape and size of tuyere desired. This box may be cast with a flange on one end and be bolted to the casing, or it may be cast without a flange and placed in the lining at the desired point as it is laid up. They are made in both ways, but it is better to cast it with a flange and bolt it to the casing, making an sir tight joint, as it then insures the blast going directly into the cupola at the point desired. Tuyere boxes laid in a lining answer the purpose very well when the lining is new, but when it becomes old and shaky, or a section is removed and replaced, the lining often settles and the grouting or filling falls out, leaving crevices through which the blast escapes between the casing and lining, and from there enters the cupola at points where it does no good.

The cold blast supplied to a cupola keeps the tuyere box cool and it is not necessary to cast it hollow and fill it with water to prevent it being melted or injured by the heat. The only part of the box that is exposed and liable to be injured is the end next the fire, and to protect it the box at this point is generally cast about ¼ inch shorter than the thickness of the lining and the end covered with a little clay or daubing.

Selling Gas Stoves.

The season for the dealer to buy a line of gas stoves is here and there is little doubt but that the use of this kind of summer cooking apparatus is on the increase. This fact, however, is not enough to make handling a line of them profitable. They must be displayed both conspicuously and with good taste, and the report of an official of an English company is worthy of consideration on this point. The company had previously paid little attention to display, but finally tried the experiment of a fine showroom. A very handsome department for the sale of gas stoves had been fitted up. It had been a slightly costly enterprise, but they looked upon the outlay in the light of an advertisement to a large extent. Apart from that, although the department had only been opened a very few weeks the sales had amounted to several hundred dollars. It had been shown that a wonderful difference existed between having stoves on view in good airy, handsome premises, where the consumer could go and examine them, see them lighted, and, if satisfied, figuratively take them away (in other words, agreeing to purchase before leaving); and the other style of doing business by which the customer was obliged to go to a small space, where he was shown merely a picture or representation of a stove, and if he made up his mind to have one had to wait to be supplied. When, as in the case of a fine display, he saw a stove that suited him the business transaction followed, and was completed at once.

A LETTER from one of the spokesmen of F. M. Borden & Bro., Philadelphia, states: "Our vocal instructor has trained the boys to shout quality first and then talk price." They are now showing their samples of Challenge Iceberg refrigerators, Reliable gas ranges, Electric and All Right oil cooks, and the New Process, Splendid, Novelty and Globe, Jr., gasoline stoves. Their stove repair department is now located at 122 North Second street, under the management of C. S. Stevens.

ODD PLATES.

THE MISSISSIPPI VALLEY STOVE COMPANY of Fulton, Ill., have been reorganized. It is stated that local capitalists have purchased the interests of the Ohio stockholders. The new Board of Directors consists of J. W. Broadhead, E. Lockheart, Edmund Jackson, H. T. Heller, Jacob Martin and A. L. Van Osdale. The president is J. W. Broadhead; vice-president, H. T. Heller; secretary, A. L. Van Osdale; treasurer, Edmund Jackson. The manager is A. L. Van Osdale and the superintendent is Jacob Martin.

OTTO W. ROPIEQUET, who was appointed the assignee of the Rogers Stove & Foundry Company of Belleville, Ill., has filed in the County Court his bond in the sum of $8000.

WORK has been resumed at the Shakopee Stove Foundry, Minnesota.

THE NEW YORK STOVE WORKS, Peekskill, N. Y., are making a handsome addition to their line of 45 styles and sizes of gas hot plates and special appliances. The new candidate for kitchen favor is a gas range which they call the Surprise and a sample of which is on exhibition at John Savery's Son & Co., 97 Beekman street, New York. The range has three cooking holes on the top, one having a double ring burner, the inner ring giving a small flame for simmering or slow cooking, and when reinforced by the large flame of the outer ring a very powerful burner is available. The range is of the high cabinet type with an oven 12 x 12 x 10 inches high, with a boiler below the oven and the burner arranged to do double duty. All of the burners are provided with a regulator on the air mixer for adjusting the air supply to the gas pressure. In appearance the range is attractive, the design of the castings being neat and embellished by a fine nickel panel and an art tile on the oven door.

THE STOVE DEALERS of Pennsylvania, New Jersey and Delaware are to have a fine variety of gas and gasoline stoves from which to make a selection, says a local observer. J. Elwood Yeager, Philadelphia, who runs the New Era line of stoves, has the Clark's Jewel gas and gasoline stoves. Faith & Co. have the Reliable gasoline stoves and another line of gas stoves. The Philadelphia branch of the Mt. Penn Stove Works are showing the Dangler line of gas and gasoline stoves. J. Geo. Kurtz & Bro, Mahood & Co. and Hansell & Belson also have attractive gas and gasoline goods.

THE MAJESTIC MFG. COMPANY of St. Louis, Mo., last week awarded the contract for the erection of a new factory building which is estimated to cost $75,000. The structure will occupy a lot fronting 108 feet on the south side of Morgan street between Twentieth and Twenty-first streets. This addition to the company's plant has been made necessary by the increase in the demand for steel ranges.

THE VICTOR STOVE COMPANY, with works located at Salem, Ohio, resumed operations on Thursday, March 14.

THE AMERICAN GAS STOVE COMPANY of 615 Ogden avenue, Chicago, Ill., have issued a catalogue and price-list of the gas cooking and heating appliances which they manufacture. The goods are made under the name "American" and are offered in a variety of styles and sizes. In the ranges the bodies, ovens and broilers are constructed of heavy cold rolled refined steel, the oven having a double bottom consisting of an extra heavy steel plate. The oven has the makers' patent automatically balanced drop door with cold handle. The broiler contains broiler pan and wire broiler grate, and there is a galvanized drip pan under the top burners. There are pilot cocks at the oven and water heater burners. The statement is made that three single and one double top cooking burners are used on all four-hole ranges, the single burner consuming 10 and the double burners 20 feet of gas per hour. The catalogue shows the American Junior, New Enterprise and Columbia hot plates or table stoves, the American china kiln and a variety of styles of gas heaters.

GAS STOVES, both for heating and for cooking, appear to be becoming more and more popular, says a London paper. According to the experience of the Gas Light & Coke Company the demand for them is increasing by leaps and bounds. In 1889 the rentals yielded a revenue of £5860; last year the income from this source had risen to no less than £18,872. Nor is this London's testimony only. From Norwich and Ipswich come reports that the adoption of these modern substitutes for kitcheners and grates has already materially affected the carriage of coal in that part of the country.

THE MARION STOVE COMPANY, Marion, Ohio, have brought out a new heater for 1895 named the Retort Oak. It is built upon the same principle as the company's well-known Retort stove, which has proved by years of success that it is possible to burn soft coal and at the same time secure a steady fire, freedom from smoke or soot and safety from gas. This is done by fitting the stove with a magazine of peculiar construction so that the fire is properly fed. The Retort Oak is of handsome appearance, having an ornamental nickel foot rall completely encircling the stove, an ornamental base, full mica illumination around the fire chamber, an artistic name plate over the central door and a well finished swing top with a graceful urn. This stove is made in two sizes, 16 and 18 inch.

AN ACTION to foreclose the trust deed on the Superior Stove Company's property, at Superior, Wis, has been filed by the Keystone National Bank, trustee. This is expected to lead to a speedy reorganization, after which the plant may be started again.

WE ARE INDEBTED to the Eclipse Stove Company, formerly the Van Wie Gas Stove Company of Rockford, Ill., for a copy of a 40-page catalogue of gas stoves which they manufacture. In the announcement to the trade attention is called to the fact that the new concern own and control all rights, titles, patterns, patents, &c., of the Van Wie Gas Stove Company, and that the manufacture of all old style stoves will be discontinued. Nothing but the latest improved goods will be turned out, special attention being given to increasing the capacity of the stove and making it possible to change a three to a four and a four to a five burner; adding a water heater, high broiler, warming oven, &c., and replacing old linings without dismounting the stove. The Eclipse Gas Stove Co. state that they will also manufacture a line of cheap one, two and three burner boiling stoves and a hotel and restaurant cake baker. The goods illustrated are for the most part cabinet ranges, the engravings being accompanied by brief descriptive par-.

ticulars, dimensions of the various parts, &c. In connection with the description of their water heater a sectional view is given showing the internal construction. A list of repair parts, reference to the Eclipse ventilated oven, sad iron heaters, soldering furnaces, &c., constitute other features of interest.

THE ANNUAL STATEMENT of the Michigan Stove Company's Employees' Mutual Benefit Association, covering the period from February 20, 1894, to February 19, 1895, shows receipts of $3693.49, and disbursements of $1529.16, leaving a cash balance of $2164.33. The total benefits disbursed during the period named amounted to $1424.16, and the total amount paid in benefits since the organization of the association, May 12, 1882, aggregates $18,336.01. From this it will be seen that the association is more than self-sustaining, and the benefits paid have in many cases helped to tide over what would otherwise have proven very serious situations.

THE WORKERS IN STOVE LINES in Albany, N. Y., are rejoicing in the prospect of a more prosperous season than the city has seen for several years. During the recent depression in the iron market local manufacturers purchased a great deal of material at reduced rates, so that they are admirably situated at this time to take advantage of the constantly improving pulse of the stove trade in general. As far as Albany is concerned, the demand for heating goods has seldom been greater at this time of the year, especially in contrast with the sales of the past several years. In consequence of a hopeful view of affairs caused by the improvement of the local and general market, Rathbone, Sard & Co. have satisfactorily settled all minor differences with their employees and will set their big stove foundry in operation again on Monday next, March 25. They will at the start employ 150 men and increase that number as business warrants. A large number of Albany iron workers have been out of employment for many months, but the men are congratulating themselves that from present indications there will be work for all before the season is very far advanced.

THE FOUNDRY of the Bussey & McLeod Stove Company, Troy, N. Y., started up again Thursday, March 14, the shut down having been of several weeks' duration. A limited number of men is employed at present, but it will probably soon be increased. The foundry was all ready to resume operations on the Tuesday morning previous, but a cylinder broke on the engine and repairs necessitated a delay until Thursday, when they were completed.

AN ENGLISH WOMAN, writing from Singapore, says: "All the cooking is done in a kitchen at the back of the house. Our cook uses coke as fuel; but wood or charcoal is the general fuel in Singapore. The appliances are very simple, but the Chinese cook can serve up a dinner equal to any to be found in the best houses in England. Cooking by gas, excepting at one of the hotels, is quite unknown in Singapore, as the Chinaman is very conservative, and will only work in the way he has been accustomed to. I have my own pet gas stove, so as to occasionally amuse myself by preparing a special dish or two; but the Chinese cook is very jealous of my work, and is always rather sulky when he sees 'Mem' cooking anything. When I say that there is not a chimney on a dwelling house in Singapore, and not a fire place in any of the rooms, it will give people at home a little idea of the unhomelike look of the town."

THE TROY OIL STOVE COMPANY, Troy, N. Y., manufactures of the Beauty oil stoves, have appointed Reeves & Smiley, Philadelphia. Pa., and C. T. Corly, Brooklyn, N. Y., agents for the sale of their goods.

THE COLLINS & BURGIE COMPANY have removed their shipping department from Chicago to Marengo, Ill. Manager Albert Moffat has transferred his headquarters to the works at Marengo, but a salesroom and sample room will still be maintained at 225 West Twelfth street, Chicago, under charge of James A. Lounsbury, secretary of the company. All shipments of either large or small lots will hereafter be made from Marengo.

THE DETROIT STOVE WORKS of Detroit, Mich., favor us with a copy of their 1895 catalogue, which they have recently issued, illustrating and describing the Detroit Jewel gas stoves. The publication is attractively printed in a blue black ink and bound in paper covers, with embossed side title in old gold and deep blue. The Detroit Jewel ranges are of rich ornamentation, substantial construction and embody the latest features of convenience and utility. They are offered in various sizes, and in connection with each illustration are given prices, code words and weights. The body of the Detroit Jewel range is of cold rolled steel, lined throughout with asbestos. The top plate is extra large and the grates are of proper hight for good combustion and made to allow for expansion when heated, so they will not crack. The oven doors are balanced, the spring being covered and so arranged that when the door drops the latter is flush with the oven bottom. The face of the door is smooth steel, forming a strong and convenient shelf when opened. Some of the opening pages are devoted to Detroit Jewel burners, while others are devoted to illustrations of Detroit Jewel hot plates.

A Problem in Hydrostatics.

At a recent meeting of the Engineers' Club of Philadelphia, C. H. Ott described an ingenious solution of a problem in hydrostatics which had come under his notice at the town of Anniston, Ala., in 1882. Works there established for the purpose of water supply and fire protection for the industrial establishments consisted of a well 10 feet in diameter, driven to a water bearing stratum 80 feet below the surface of the ground, and containing a double acting single cylinder pump located about 15 feet above the bottom of the well and worked from the pump house above.

As the water required at the time these works were established was not very heavy, the supply from the well in six hours of pumping was sufficient for 12 hours of service, and the engine and pump had sufficient capacity to empty the well within 8 or 10 feet of the bottom in about 12 hours of continuous working. When it became necessary to repair or examine the pump cylinder the water was lowered by pumpage to the greatest possible extent, and then, by means of a steam jet, the well was kept drained

As the town grew, the supply from the well became inadequate, and a new well was started about 40 feet east of the pumping well. A shaft 6 x 12 feet was driven to a depth of 120 feet, where a flow of water was had. In order to provide storage for water, and to connect the new shaft with the pumping well, a timbered drift, 4 x 6 feet, was run to directly beneath and about 40 feet below the bottom of the pumping well. The water supply not yet being deemed sufficient, an 8-inch well, cased with pipe, was bored in the new shaft to a depth of 230 feet below the pump house floor, and a great flow of water was struck. The drill in passing through the disintegrated limestone bored a much larger hole than 8 inches in diameter, so that large quantities of water passed up outside of the casing. When the depth of 230 feet was reached the latter quantity was so great that the water level in the new shaft could not be lowered and maintained with the apparatus at hand to more than about 20 feet below the pump house floor. An 8 inch hole was then drilled from the bottom of the pumping well to the drift below. It was still found impossible with all of the pumps and jet apparatus available to lower the water level in the pumping well to more than about 25 feet below the pump house floor, thus furnishing an ample water supply.

Some months after these arrangements had been finished a failure occurred in the pump cylinder under 50 feet of water, and with no apparatus available to lower the water in the well sufficiently to make the necessary repairs. After several expedients had been tried the following contrivance was devised:

A balloon shaped bag, in dimensions about 3 feet in diameter and 6 feet long, was made of six plys of bed ticking, roughly quilted into squares. The bag was soaked in linseed oil, and a quantity of rye flour inserted and well shaken around. A 1-inch pipe terminating in a sleeve was inserted in the mouth of the bag, which was then securely wired around the pipe. Sewn to the bottom of the bag was a stout ring and to this was wired a half pig of iron by a ring bolt inserted into its end. The bag was then wrapped tightly with twine into a cylindrical shape and was lowered into the drill hole in the pumping well by means of sections of pipe until the weight struck bottom; by estimation one-half of the bag entering the drift below, the remainder being in the drill hole. The 1-inch pipe was then attached to the service main through a stop cock and a pressure gauge attached thereto, and the bag was slowly distended until a pressure of 50 pounds per square inch was reached and maintained. The upper part of the bag swelled out and accommodated itself to the irregularities of the drill hole, the lower part of the bag swelled out into a bulb shape, the whole resembling an inverted champagne bottle cork. The drainage pump and steam jet were then set to work and speedily emptied the pumping well, the bag being held in shape during the lowering of the water by an interior water pressure of about 10 pounds per square inch in excess of the exterior water pressure. The repairs to the pump having been readily made the water was exhausted from the bag and the apparatus withdrawn.

As the materials not already on hand could only have been obtained by express in about 48 hours, and as the contrivance described was easily made and did the work so quickly that the pumping engine was stopped only about ten hours, Mr. Ott considered that the treatment of this problem was a most ingenious and clever solution of what threatened to be a most serious condition of affairs for that neighborhood.

TRADE REPORT.

The Iron Market.

The advance in wages voluntarily granted to the men in the Connellsville Coke region has been a startling surprise, and has appeared to many a revelation concerning the movements of a leading Pittsburgh interest. The other operators have fallen into line promptly. A good deal of guessing is being done as to the position in which some of the Coke operators, furnace companies and Steel producers find themselves. Have Coke producers sold largely at 90¢ up to July? Have furnace interests contracted to sell Bessemer Pig for the second quarter at the low prices recently ruling without covering their Coke requirements? These are the questions which are being eagerly asked.

It is pretty well known that nearly everybody has stocked up with Coke lately as fast as possible. It is a matter of fact that stocks of Pig Iron have increased during the past few months. These points are in favor of the surprised buyer.

The one argument on the other side is that prospective cost has gone up. In other words, more money must be asked for crude and finished products as soon as the supplies of cheap Coke are exhausted. Whether the advance will be 25¢ or 35¢ ℔ ton is still a question.

It may as well be acknowledged that many in the trade regard the movement with suspicion. They urge that the market is being taken hold of by the wrong end, and that only an increased demand and not a forced rise in the cost can bring about a lasting improvement.

Against that it may be urged that after all it is largely a matter of sentiment; that the industry must be jerked out of the old rut; that if that is once done, no matter how, the right start has been made, to which many will give their powerful aid.

Pig Iron.—The New York market is quiet and displays a weakening tendency so far as prices are concerned. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

In the Philadelphia market sellers are talking a little more money; some who sold at $11 for No. 2 Foundry X claim to be holding firm for $11.25, and those who sold at $11.25 similarly ask $11.50. No objection will be made to these prices, providing that the movement is uniform all along the line. Consumers would be glad to see an advance, the great point being not to pay more than others are paying. It is thought not unlikely that prices will stiffen up, and it is doubtful if the inside figures of last week would be accepted as readily as they were at that time. Producers feel more encouraged than they have done for some time past. Quotations are usually given about as follows, but it is not improbable that the inside figures will be more of an exception than they have been heretofore:

Standard No. 1 Foundry X	$12.00 to $12.50
Standard No. 2 Foundry X	11.25 to 11.50
No. 2 Plain	10.75 to 11.00
No. 1 Soft	11.50 to 11.75
No. 2 Soft	10.75 to 11.00

Another week of increasing business in local Coke Iron marks the advance toward better times in the Chicago market. A decided improvement in inquiry has taken place, and consumers are buying small lots very freely, with some disposition to increase their shipments. Some expectation exists of an advance in local Iron in consequence of higher prices on Connellsville Coke, although it remains to be seen whether West Virginia Coke will also be advanced. Unless this is done it is likely that the proportion of West Virginia Coke used here will grow considerably. Southern Iron was comparatively quiet during the week. The outlook for next week's business is much better, as quite a number of good inquiries have recently developed. An item of interest to foundrymen in adjacent towns is the notice which has been given of an advance on freights to those points of 20¢ ℔ ton from Southern localities. Prices have recently relaxed to some extent, and our quotations are revised accordingly. Quotations are as follows for cash:

Lake Superior Charcoal	$12.75 to $13.00
Local Coke Foundry, No. 1	10.25 to 10.50
Local Coke Foundry, No. 2	9.75 to 10.00
Local Coke Foundry, No. 3	9.50 to 9.75
Local Scotch No. 1	10.25 to 10.50
Ohio Strong Softeners, No. 1	12.50 to 13.00
Southern Silvery, No. 1	11.50 to 11.75
Southern Silvery, No. 2	11.25 to 11.50
Southern Coke, No. 2	10.00 to 10.25
Southern Coke, No. 3	9.50 to 9.75
Southern, No. 1, Soft	10.00 to 10.25
Southern, No. 2, Soft	9.75 to 10.00

Careful inquiry shows that most furnaces in the Pittsburgh district whose Coke contracts expire on March 31 have very little Iron sold ahead at low prices. Those who sold ahead based on 90-cent Coke will probably prefer to close down in preference to paying higher prices for Coke and making the Iron at a loss. As to Pittsburgh prices, little can be said. Furnaces whose Coke contracts expire with this month are refusing to quote. Those who have cheap Coke up to July 1, are holding off to see whether higher prices will not come. In the absence of any recent sales we quote nominally as follows:

No. 1 Foundry	$10.50 to $10.65, cash
No. 2 Foundry	9.65 to 9.70 "

The buying movement in the Pig Iron market at Cincinnati continues quite active, but while there is an evident disposition among consumers to provide for their wants, in part at least, for the next four or five months, they are unwilling to meet any demand for higher prices and thus far the increased volume of business has not resulted in any appreciation of values. The largest buying during the past few days has been by rolling mills in the northern part of the State. There have also been several contracts of moment placed by local foundries. The sales to foundries were mainly of No. 2 Foundry. One encouraging feature is the number of small sales making from single cars up to 500 ton lots and the diversity of interests covered by the buying movement. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.00 to 9.25
Southern Coke, No. 3	8.50 to 8.75
Ohio Soft Stone Coal, No. 1	14.50 to 15.00
Ohio Soft Stone Coal, No. 2	14.00 to 14.50
Lake Superior Coke No 1	11.75 to 12.25
Lake Superior Coke, No. 2	10.75 to 11.50
Hanging Rock Charcoal, No. 1	16.00 to 16.50
Hanging Rock Charcoal No. 2	15.50 to 16.00
Tennessee Charcoal, No. 1	13.00 to 13.50
Tennessee Charcoal, No. 2	12.00 to 12.50
Bessemer	11.65 to 12.00

Metal Market.

Pig Tin.—There has been a sharp rise in prices on both prompt and future deliveries and more or less excitement in the wholesale market at times, yet a smaller volume of business than might have been expected under the circumstances. On prompt and current month delivery the advance was about 0.70¢. May delivery moved up 0.60¢ and later futures 0.40¢ @ 0.50¢. Speculative dealings, however, did not involve much, if anything, over 500 tons, despite this movement in values and remarkably heavy trading in London. Out of town jobbing purchases were merely routine in character and nothing more than the average business was done with consumers. Not a few of the latter have a good stock from deliveries made on prior purchases and requirements generally seem to have been so well covered that the speculative flurry stimulated purchases in a very moderate degree only. The rise in prices was due chiefly to comparatively light shipments from the Straits and the advance in silver. The shipments during the first half of March were 1460 tons, of which 230 tons to the United States, 900 tons to London and 230 tons to the Continent, against 1775 tons in the corresponding period last year. Quotations on small lots of Straits from store are virtually unchanged at 14½¢ @ 15¢ ℔ lb.

Copper.—Continued pressure to sell has caused a further decline in prices and the market remains unsettled and depressed. Home consumers have taken a very fair amount of Copper through closing contracts previously pending and new purchases at the lower range of prices. Electrolytic sorts fared relatively the best. Some export purchases have been made and more or less stock has gone abroad on consignment. The entire movement, however, has little effect against the depressing influence of large supplies at the mines and continued heavy production. Exports from this port the past week include 253 tons Plates, 60 tons Ingots, 130 tons Pigs, 40 tons Bars and 290 tons Matte. In small retail business inquiry has been only moderate and prices unchanged on a basis of 10½¢ for Lake Ingot in small parcels.

Sheet Copper.—While the demand for cornice Copper is fully equal to if it does not exceed that of last year at the same time, it still lags behind the average of a good season. Inquiry is, however, rather more active and the

large amount of building in prospect in this section gives promise of much better trade later in the year. Small lots of sheet Copper from store are quoted at the net list price of 14¢ ℔ lb.

Pig Lead.—A decided change has taken place in the market and there are indications that the long drawn out contest between prominent consumers and producers has ended, temporarily at least. In any event it is the fact that fully 2500 tons have been taken by home consumers and that nearly or quite 1500 tons were purchased for export. Export purchases were stimulated by a rise in London prices, due to comparatively light stocks of Spanish and English Lead there, and home trade buying was helped along by that circumstance and knowledge as to the favorable statistical position on this side of the Atlantic consequent upon restricted production here during the winter months. Jobbers report a rather light demand for both Pig and manufactured Lead, with no changes in the prices for small parcels quoted last week—namely, 3¼¢ for American Pig, 5¼¢ for Pipe, and 6¼¢ for Sheet; the two last quoted being subject to a discount of 20 %.

Spelter.—Nothing more than routine business has been effected in this market, and there is little if any change as regards demand. In short, the market here is still a very narrow one in all particulars. Enough orders go out from other quarters to keep the primary market in very fair shape, however. Prices for small lots of good Western brands from store are quoted at 3¾¢ @ 4¢ ℔ lb.

Antimony.—Jobbing business is fair, but otherwise there is little doing. Prices for small parcels are quoted at 9¼¢ @ 9½¢ for Cookson's and 8¢ for Hallett's.

Nickel.—Seller's quotations remain at 35¢ @ 40¢, as to size of lot.

Tin Plate.—Having passed the proverbially fatal "ides of March," the long and continuous period of dullness in the Tin Plate trade seems to have been broken. A better tone has developed in the market, and some quite liberal purchases have been made of ordinary Coke Plates for delivery during the spring months. There has also been more general buying of spot stock, low prices having at length served to stimulate purchases. Assistance to sellers has come also from the curtailment of production abroad, and the consequent depletion of stocks, leading to a general hardening of prices to a greater or lesser extent all along the line—that is to say, concessions on quoted rates are less readily given. No quotable change in prices has taken place, however. The weather has been against building operations, and the call for Roofing Plates has been very moderate accordingly. Small business is still behind the average, and the size of individual orders does not yet increase much beyond the limit of present requirements.

A special London cable dispatch of March 20 to *The Iron Age* reports as follows in regard to the British Tin Plate market: In the Tin Plate market there has been a change for the better. Inquiries have improved decidedly and buyers are offering 3 half-pence over last week's bids. Sellers' figures are up 3 pence from the lowest point touched. Large lines for Russia have been placed and there is improved demand from the Continent. Quotations, f.o.b. Wales, are as follows:

Bessemer Cokes, IC 14 x 20	9/1½	@ 9/3
Siemens Cokes, IC 14 x 20	9/4½	@ 9/6
Ternes, 20 x 28	17/6	@ 22 6
Charcoals, IC 14 x 20	10/	@ 13/

Sheet Iron.—Both Black and Galvanized Sheets are in exceedingly good demand. Mills are well supplied with orders, and manufacturers are showing some disinclination to contract for future deliveries, particularly in view of the possibility of an advance in Billets. Values are, however, as low as ever, notwithstanding that the leading mills are refusing to book at the lowest prices prevailing. Small lots of No. 27 Common Iron are quoted at 2.60¢ @ 2 65¢ from stock and of Galvanized at 75 and 10 % off.

Chicago Report.

Scrap.—Business continues fair, with a marked scarcity in Cast Scrap. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per ℔
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2¼¢
Rubber	....	4 ¢

Anthracite.—Trade is quiet. Winter is about over, and little will now be done for several months. Dealers here have large stocks with which to enter upon another season. Carload lots of 12 net tons or over are quoted as follows, although some concessions are now being made:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$4.75	$5 00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8.10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

A MEETING of the Canadian tinware manufacturers was held last week in Montreal, and was attended by representatives of all the leading firms. Some changes were made in the list prices of goods and a number of important lines of goods were withdrawn from the association's list and will henceforth be sold at open prices.

CONDITION OF THE

Hardware Trade.

TRADE runs along without any important modification in volume, the demand being somewhat uneven, and, to a certain extent, spasmodic. Seasonable goods are moving with a fair degree of freedom and constitute a considerable portion of the current business. It is evident that trade in general is, on the whole, better in the West than in the East, and the reports which come from many Western points are gratifying. It is the view of many well-informed persons that as soon as moderate weather prevails in the East there will be a marked quickening in the demand, and that business will assume something like its normal volume. Advices from architects and others in close touch with builders indicate that there will be an increased amount of building this year, and some are taking sanguine views of the prospect. The outlook for the market in general would be much more satisfactory if there were evidences of a decided improvement in its tone so far as prices are concerned, but these unfortunately continue without showing many signs of firmness. Some of the staples are not apparently quite as strong as a short time ago, and on many classes of Shelf Hardware and miscellaneous goods prices are somewhat ragged, furnishing sufficient reason for the manufacturers' complaint of their unprofitableness. Manufacturers are, however, learning to be more conservative than formerly, and some of them are holding aloof from the market for a while rather than force the sale of their goods by further concessions. Stocks certainly are low both in the hands of producers and the trade, and a sudden demand would in many lines cause something of a scarcity.

Advices from Chicago.—The past week showed a rapid growth in the volume of business. A leading house here is reported to have received on Monday the largest mail in any one day for three years. Orders are not only more numerous, but they are steadily growing larger. One of the strongest features of the trade to which allusion has previously been made is the continuous demand for new stocks of goods. Scarcely a day passes that a new stock is not purchased in this jobbing center. Orders of this character swell the volume of business very decidedly. The general demand for goods is still of a hand to-mouth character, orders being sent in only when the goods are needed. This is shown by the urgent demand for prompt shipment. Tinware has been moving much more freely. The only material change in prices recently made is an advance of 5 per cent. on the new list of Carriage and Machine Bolts. Excepting the cut in Wire Nails, nothing has happened so far this year to seriously disturb the even course of the jobbing trade in this locality. No serious cut has been made in any other class of goods by jobbers in order to induce trade, as has been the case in previous seasons. The Nail situation now promises to adjust itself, and in a short time this irregularity will probably be eliminated. Heavy Hardware is picking up, particularly with agricultural implement makers.

Notes on Prices.

Wire Nails.—The Wire Nail market is characterized by a good degree of activity and many inquiries are being received by the manufacturers. It is evident that there has been quite a free movement of Nails from jobbers to retailers, making it necessary for the former to replenish their stocks. There is no doubt that the fact that the jobbers, especially some of the Chicago houses, have been underselling the manufacturers has had an injurious effect on the market as a whole. The situation is, however, referred to by the manufacturers as very satisfactory, and the expectation is expressed that prices will be well maintained and the volume of business large.

Advices from Chicago.—Manufacturers report a very strong movement in carload lots, with further indications of a much larger trade with the fine spring weather now extending over the Northwest. All buyers are pressing for immediate shipment. Factory prices are quoted on the basis of $1, Chicago, for carload lots, and $1.05 for small lots. A few jobbers continue to name 95 cents for carload lots, but this price is not so freely given as was the case earlier in the season, and it is now regarded as likely to be withdrawn at any day. Jobbers' quotations usually are $1.05 for shipments from stock.

Cut Nails.—During the past week there has been a good business in Cut Nails. Inquiries have been many and orders satisfactory considering the season and the general condition of trade. Small lots from store, New York, at 85 to 90 cents.

Advices from Chicago.—The trade in Steel Cut Nails pursues the even tenor of its way. Orders are fair and business is steady. Small lots from stock are selling at $1.

Barb Wire.—The Barb Wire marke is fairly active and little complaint is made in regard to the volume of business. The outlook also for the season continues good. A slight weakness has, however, been developed in prices and the market is represented by the quotation of $1.85 to $1.90 for carload lots of Four-Point Galvanized at mill. Some of the jobbing houses are offering Wire at the above figures and in some instances slightly shading them.

Advices from Chicago.—The demand is increasing in parallel lines with that for Wire Nails. Shipments from factories are very heavy and the time seems to be close at hand when it will be impossible to make prompt delivery on orders received. Small lots from stock are selling at $1.65 for Painted and $2 for Galvanized.

Shot.—Announcement is made that on and after March 18, 1895, the 2½ per cent. discount heretofore allowed to ton lot buyers of Shot is withdrawn. The following are the present terms and prices, terms net 30 days, or 2 per cent. discount for cash in ten days from date of bill, a discount of 5 cents per bag (25 pounds) being allowed on lots of 2000 pounds and upward taken at one time:

Drop Shot up to B, 25-pound bag	$1.15
" " 5 " "	.30
Buck Shot (including Bs, Ts & F.), 25-pound bag	1.40
Buck Shot (including Bs, Ts & F.), 5-pound bag	.35
Chilled Shot, 25 pound bag	1 40
" 5 "	.35
Dust Shot, 25-pound bag	1.75
" 5 "	.40

Water Filters.—A description of the Cataract and Ideal Water Filters of the Germ Proof Filter Company, 16 Cedar street, New York, was given in last week's issue. These Filters are sold to the trade from the following list, which is subject to a discount of 33⅓ per cent.:

	Per dozen.
Cataract Water Filter	$18
Ideal Water Filter	30

Glass.—There is no reduction in the number of window Glass factories in operation, owing to the limited demand and the low prices which have been ruling for some time. It is reported that at the meeting of Window Glass manufacturers held at Pittsburgh, Pa., March 19, an association was formed to be known as the National Association of Window Glass Manufacturers. The next meeting of the manufacturers will be held in Pittsburgh some time in April, which is expected to develop the result of the various conferences and meetings. The fact that the Glass manufacturers were considering a plan to put the manufacture of Glass on a more profitable basis, taken in connection with the near approach of spring trade, may have influenced the makers to some extent. Plans are being matured for bringing all the plate Glass factories under one management, and it is reported that orders for plate Glass are being placed more freely.

Old Metals.—Rather more business has been done, but stocks are amply sufficient to meet all requirements. Consequently dealers have not advanced their purchasing prices to any quotable extent. The following represent about the rates now ruling for New York deliveries:

Heavy Copper	℔ 7 ¢
Light and Tinned Copper	℔ 6¼¢
Heavy Brass	℔ 4¾¢
Light Brass	℔ 3¾¢
Lead	℔ 2¾¢
Tea Lead	℔ 2½¢
Zinc	℔ 2⅜¢
No. 1 Pewter	℔ 10 ¢
No. 2 Pewter	℔ 5½¢
Wrought Scrap Iron, ℔ gross ton	$7.50 @ $8.00
Heavy Cast Scrap....℔ gross ton	7.50 @ 8.50
Stove Plate Scrap....℔ gross ton	5.00
Burnt Iron....℔ gross ton	3.00

Old Rags, Paper, &c.—The demand for Paper Stock is fair but somewhat irregular. Dealers' purchasing prices have not advanced any, quotations being as follows for this city:

No. 1 White Rags	℔ 3 @ 3¼¢
No. 2 White Rags	℔ 2¼ @ 2½¢
Mixed Rags	℔ ¾ @ 1 ¢
Blues and 3ds	℔ 1⅛ @ 1⅜¢
Hard Sized White Shavings	℔ 2⅛ @ 2¼¢
No. 1 White Book Shavings	℔ 1¾ @ 2⅛¢
No. 2 White Book Shavings	℔ 1 @ 1⅛¢
Light Book Shavings	℔ ⅝¢
No. 1 Mixed Shavings	℔ ⅞ @ 1 ¢
No. 2 Mixed Shavings	℔ ⅝ @ ¾¢
No. 1 Printed Books	℔ 1 @ 1¼¢
Ordinary Mixed Books	℔ ½ @ ¾¢
Newspapers	℔ ½ @ 3-5¢
No. 1 Manila Paper	℔ ¾ @ 1 ¢
No 2 Manila Paper	℔ ⅝ @ ¾¢
Bogus Paper	℔ ½¢
Common Paper	℔ ¼ @ ⅜¢
Straw Chips	℔ ⅜¢
Binders' Clippings	℔ ⅝¢
Jute Butts	℔ 1½ @ 1¾¢
No. 1 Jute Bagging	℔ 1 @ 1¼¢
Mixed Bagging	℔ ¾ @ 1 ¢
No. 2 Bagging	℔ ½ @ ¾¢
Hemp Twine	℔ 2 @ 2¼¢
Manila Rope	℔ 2 @ 2¼¢
Jute Rope	℔ 1½ @ 1¾¢
Mixed Rope	℔ ¾ @ ⅞¢

Old Rubber.—The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots, ℔	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory, ℔	@ .05¼
Rubber Shoes, less than carleads, ℔	@ .04¾
White Wringer Rolls, ℔	@ .03⅞
White Syringes, ℔	@ .03⅞

CONTENTS.

Editorials:	PAGE.
A Blow at Eight-Hour Laws	27
Displacing Planished Iron for Locomotive Jackets	27
Capital and Confidence	27
The Brosnan Molding Machine. Illus.	28
The Richards Molding Machines. Illus.	29
The 1895 Pattern Economy Furnace. Ill.	31
The Letter Box—	
Elbow Pattern	32
Allowance for Iron Pipe	32
Trouble With Furnace. Illustrated.	32
Wants Cement for Marble and Basins.	32
Japanning Tin	32
Air Bound Service. Illustrated	33
Pattern for Conveyer	33
Stained Galvanized Iron	33
A Peculiar Furnace Experience. Ill.	34
Trouble with a Water Tank	34
Finish for Slate Roofing on Ridge and Hip	34
Which Is Best for Furnace Tops?	34
Water Hammer in Pipes	35
Method of Heating Water	35
Furnace Pipe Rule	35
Is It a Good Investment?	35
Are Gravel Roofs Durable?	35
Keeping Shop Tools	35
Pattern Wanted	35
Steam and Hot Water—	
A Pipe Fitting Question. Illustrated.	36
Loss of Heat and Radiation	36
Heating Power of Petroleum and Gas Stoves	37
Circuit Systems of Hot Water	37
Formula for Hot Water Piping	38
Smith's Little Giant Water Heater. Ill.	38
Heating Notes	38
Heating and Plumbing—New Work and Contracts	39
The Globe Soldering Furnace. Illus.	39
The Tin Shop—	
Pattern for Offset, Oblong to Round. Illustrated	40
The Hardening of Aluminum	42
Rating Feed Water Heaters	42
The Retail Store—	
Iron Platform for Cisterns and Wells. Illustrated	43
The Champion Roaster or Oven. Illus.	43
West's Dust Pan. Illustrated.	43
Porcelain Lined Milk Delivery Can. Ill.	44
Stove and Hardware Dealers Along the Hudson River	44
Memoranda	44
Salt Lake Supplied with Natural Gas	44
Plumbing and Gas Fitting—	
Public Conveniences	45
Universal Urinal Tank, Illustrated	45
James M. Heatherton	45
The New Era Siphon Closet. Illus.	45
The Mosley Circulating Water Heater. Illustrated	46
Operation of Siphon Closets	46
Burst Pipes	46
Traps and Vents	46
Wade's Plumbing Specialties	47
Roofing and Cornice—	
Berger Bros	48
Flashings	48
No. 20 Power Pipe Machine. Illus.	49
Tin Plates—	
The Proposed Restriction of Welsh Tin Plate Production	50
Scrap	50
Furnace Fittings	51
Stove Trade Notes—	
The Ohio Stove Trade.	52
Settlement of the Trouble at the Southern Stove Works	52
S. M. Howes	53
The Manufacture of Furnaces in Syracuse	53
Cupola Tuyeres.—VI	53
Selling Gas Stoves	54
Odd Plates	54
A Problem in Hydrostatics	55
Trade Report—	
The Iron Market	56
Metal Market	56
Chicago Report	57
Condition of the Hardware Trade	57
Notes on Prices	58
Metal and Miscellaneous Prices	59
Labor Exchange	
Help and Situations Wanted	61

Metal and Miscellaneous Prices.

CHICAGO, MARCH 21, 1895.

Tin—

Straits pigs.....15½@¾¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and MelynGrade	IC, 10 x 14	@ $5.75
	IC, 12 x 12	@ 5.75
	IC, 14 x 20	@ 5.75
	IC, 20 x 28	@ 11.50
	IX, 10 x 14	@ 7.50
	IX, 12 x 12	@ 7.50
	IX, 14 x 20	@ 7.50
	IXX, 14 x 20	@ 9.25
	IXXX, 14 x 20	@ 11.00
	IXXXX, 14 x 20	@ 12.75
	IX, 20 x 28	@ 15.00
	IXX, 20 x 28	@ 18.50
	IXXX, 20 x 28	@ 22.00
	IXXXX, 20 x 28	@ 25.50
	DC, 12½ x 17	@ 5.50
	DX, 12½ x 17	@ 7.25
Allaway Grade.	IC, 10 x 14	@ 5.12½
	IC, 12 x 12	@ 5.12½
	IC, 14 x 20	@ 5.12½
	IC, 20 x 28	@ 10.25
	IX, 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX, 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC. 10x14, 14x20	@ $4.70
IC, 14x20, 90 lb	@ 4.25
IC, 14x20, 100 lb	@ 4.50
10 x 20	@ 7.00
20 x 28	@ 9.50
IX, 10x14, 14 x 20	@ 6.00
E.V. Grade. IC, 10x14, 14x20	@ ....

Charcoal Plates.—Terne

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $4.75
20 x 28	@ 9.50
IX. 20 x 28	@ 12.00
Worcester Brand and equal.—	
IC. 14 x 20	@ 4.87½
IC, 20 x 28	@ 9.75
IX, 14 x 20	@ 6.12
IX, 20 x 28	@ 12.25

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56		$12.50
XX, 14 x 56	25.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.25
IX, 10 x 14, 12 x 12, 14 x 20 6.50

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.50
IX, 10 x 14, 12 x 12, 14 x 20. 7.00

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 6.00
IX, 10 x 14, 12 x 12, 14 x 20.. 7.50

Usual extraf or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20.....$6.25
IX, full weight, 14 x 20..... 8.00

Irondale A A:

IC, full weight, 14 x 20..... 5.25
IX, full weight, 14 x 20..... 6.75

Irondale A:

IC, full weight, 14 x 20..... 5.00

Irondale B:

IC, 100 lbs , 14 x 20 ..... 4.25
IC, full weight, 14 x 20..... 5.00

Irondale C, IC, 14 x 20, 100 lbs..... 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $4.75
Old Hundred, IC, 14 x 20, 100 lbs.... 4.50
R. W & B., IC, 20 x 28, 216 lbs..... 9 50
Old Hundred, IC, 20 x 28, 200 lbs.... 9.00

Roofing Plates.

Palm, IC, 20 x 28.....@$10.00
Palm, IX, 20 x 28..... @ 12.00
Empire, IC, 20 x 28..... @ 10.75
Empire, IX, 20 x 28..... @ ....
Hickory, IC, 20 x 28..... @ 11.50
" IX, 20 x 28..... @ 14.00
Alaska (heavily coated), IC, 20x28@ 13.00
Alaska IX, 20 x 28..... @ 16.00
Special, IC, 20 x 28..... @ 13.00
" IX, 20 x 28..... @ 16.00
Niagara, IC, 20 x 28 ..... 9.50
Iroquois, IC, 20 x 28..... 9.00
Westmoreland:
IC, 14 x 20 ..... 5.00
IC, 20 x 28..... 10.00
IX, 14 x 20..... 6.25
IX, 20 x 28..... 12.50
Kenwood:
IC, 14 x 20..... 4.75
IC, 20 x 28..... 9.50
Furmston:
IC, 14 x 20..... 4.50
IC, 20 x 28..... 9.00
IX, 20 x 28..... 11.50
Irondale AA, IC, 14 x 20..... 5.75
Irondale A, IC, 20 x 28..... 10.50
Irondale B, IC, 20 x 28..... 10.00
Each extra cross $1.50.
Challenge, IC, 20 x 28.....10.50
Jnno:
IC, 14 x 20..... ....
IC. 20 x 28..... ....
Illinois, Old Method:
IC. 20 x 28 ..... 13.50
IX, 20 x 28..... 16.50
E. L.:
IC, 20 x 28..... 10.75
IX, 20 x 28 ..... 13.25
Jessie:
IC, 14 x 20..... 10.25
Old Process:
IC, 14 x 20..... 8.00
IX, 14 x 20..... 9.50
IC, 20 x 28..... 16.00
IX, 20 x 28..... 19.00
H. B. L., Old Style:
IC, 14 x 20..... 7.00
IX, 14 x 20..... 8.25
IC, 20 x 28..... 14.00
IX, 20 x 28..... 16.50
H. G. M. & Co., New Process:
IC, 14 x 20..... 4.50
IC, 20 x 28..... 9.00

Extra Fine Granite:
IC, 14 x 20..... 4.87½
IC, 20 x 28..... 9.75
IX, 20 x 28..... 12.25
Raveuswood:
IC, 14 x 20..... 5.25
IC, 20 x 28..... 10.50
IX, 20 x 28..... 13.00
H. G. M., Old Style:
IC, 14 x 20..... 7.00
IC, 20 x 28..... 14.00
IX, 20 x 28..... 16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.40

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 1-10¢	2.60¢
17 to 20	₩ lb 2 2-10¢	2.70¢
21 to 24	₩ lb 2 3-10¢	2.80¢
25 and 26	₩ lb 2 4-10¢	2.90¢
27	₩ lb 2 5-10¢	3.00¢

Russia, Planished, &c.

100 lbs.

Patent Planished, ₩ lb, A.....$10.20 } 10%
Patent Planished, ₩ lb. B..... 9.20 } dis
Craig's Polished Sheet Steel.....8¼¢

Galvanized.

Juniata, or first quality .....
dis. 75&10@75&10&2½%

Copper—

Ingot.

Lake.....10¼¢ @ 10½¢
Casting Brands..... 9¾¢ @ 10 ¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gliding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)
Discount, 40%.

Slab Spelter—

Western Spelter.....3¾¢

Sheet Zinc—

600 lb casks.....$4.50
300 lb casks,..... 4.75
Loose sheets..... 5.00

Solder—

½&½..... 9¾@10¢
Extra Wiping.....8½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....9¾@10
Hallett's.....8½@8¾¢

Lead—

Soft Pig Lead..... 3¼¢
Bar..... 3¾¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe..... 25¢
Sheet.....6¢, dis. 10¢

Wrought-Iron Pipe—

1¼ and under, Plain	70%
1¼ and under, Galv	64%
1½ and over, Plain	77%
1½ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	68%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 5 inches, inclusive	dis 75&10%
Other sizes	dis 70%

Leader Pipes—

Ahendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	70%
Gordon & Gilbert's Corrugated	70%
Ritchie's (Galv. Iron only) Cor'd	70%
Ritchie's Spiral Lock Seam, Galv'd	60%
Austin's Spiral Ribbed Pipe	65%
James A. Miller Bros. (Galv'd Iron only) Corrugated	70%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list
50&10%, delivered east of Omaha

Steel Roofing—

Perfection	$2.75 square
Climax	$2.65 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$2.10 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	8 @ 10¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	60¢
Linseed Oil, Raw, in bbls	58¢
Mineral Paints	2@4¢
Orange Mineral	8¢
Pure White Lead in Oil	5¼@5½¢
Dry White Lead in bbls	4¾@5¼¢
Red Lead, American	5¼@5½¢
Red Venetian, English, dry	1½@1¾¢
Red Venetian in oil; asst'd cans, 8½¢ kegs	7½¢
Sipe's Japan Oil, in bbls. ₩ gal	84¢
Spirits Turpentine, in bbls., ₩ gal.	42¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.40
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.00
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.25
Roofing Pitch, ₩ bbl. of 300 lb	$2.80

NEW YORK, MARCH 22, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots

Small lots	₩ lb, 63¢
100-lb lots	₩ lb, 60¢
Ton lots	₩ lb, 58¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	₩ lb, 60¢
100-lb lots	₩ lb, 55¢
Ton lots	₩ lb, 53¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	₩ lb, 55¢
100-lb lots	₩ lb, 53¢
Ton lots	₩ lb, 50¢

Antimony—

Cookson	₩ lb, 9¼@9½¢
Hallett's	₩ lb, 8 ¢

Brass—

Planished.....net

Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ft.	
¼-in. up to 2-in	$0.35	25 @ 30%
⅝-in. up to ¾-in	.36	
½-in. up to ⅝-in	.38	
⅜-in. up to ½-in	.41	
5-16-in. up to ⅜ in	.48	
¼-in. up to 5-16-in	.65	
3-16-in. up to ¼-in	1.00	
⅛-in. up to 3-16-in	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 19, inclusive,	.38	

Copper and Bronze Tubing—

34 ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square—*

Galvanized	70%
Galvanized, Locked Joints	70%
Tin	70%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..18¢ ₩ lb, net

Ingot.

Lake	10½¢
Ansonia Grade Arisona	10¼¢
Ansonia Grade Casting	9¾¢
Planished	net
Sheet and Bolt	14¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:

Lap or Slip Joint, Galvanized	75%
Lap or Slip Joint, Terne	70%

Eave-Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized.....85%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.

Tin	85%
Galvanized	85%

Corrugated.

Flat Crimp.

Galvanized	70%

Round or Square.

Tin	70%
Galvanized	70%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb 2.25	2.50¢
Nos. 17 to 21	₩ lb. 2.35	2.60¢
Nos. 22 to 24	₩ lb, 2.45	2.70¢
Nos. 25 and 26	₩ lb. 2.55	2.80¢
No. 27	₩ lb. 2.65	2.90¢
No. 28	₩ lb, 2.75	3.00¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ lb, 11@11½¢
Patent Planished	₩ lb, A, 10¢; B, 9¢, 8¢
Craig Polished Sheet Steel	₩ lb 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75&10% off.
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig	3½@3¾¢
Bar	4@4½¢
Pipe	5½¢ 20%
Tin Lined Pipe	12½¢ 20%
Block Tin Pipe	25¢ 20%
Sheet	6½¢, 20%

Old Lead in exchange, 2½¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	30%
Netting, Painted Sheets	30%
Door Mats, Galvanized	35%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100 @ 500 lb	5¾
Lead, Amn. White, in oil	@ 5¾
Lead, Red, bbls. and ½ bbls	@ 5¾
Lead, Red, kegs	@ 5¾
Ocher, American	@ 1½
Red Venetian, American	@ 1½
Linseed Oil:	
Raw, ₩ gal	@ .56
Boiled	@ .59
Spirits Turpentine:	
In bbls	@ .30
Putty:	
In barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼
Roofing Material, &c.:	
Asphaltum Trinidad Refined, ₩ ton	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ lb	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.43½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq.ft.	$1.85
Roofing Pitch ₩ bbl	$2.25

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron. Soil—

"Standard" Pipe, 2 to 6 inches	65&10%
Fittings, Pipe, " "	65&10&10%
Extra Heavy Pipe, " "	65&10&10%
Fittings, Heavy Pipe, " "	65&10&10%
Large sizes of both kinds	65&10%
Fittings for both kinds	65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	88½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained

Rosin, C. & D.	₩ bbl. $1.66@$1.67
Rosin, E. & F.	₩ bbl. $1.70@$1.80
Rosin, G. & H.	₩ bbl. $1.90@$2.15
Rosin, I. & K.	₩ bbl $2.35@$2.50
Rosin, M. & N.	₩ bbl $2.90@$3.00

Seamless Brass Tubes..net

List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr.	$3.25@$4.50
Pen Argyle, ₩ sqr.	3.00@ 3.85
Peach Bottom, ₩ sqr.	4.75@ 5.60
No. 1 Chapman, ₩ sqr.	8.90@ 4.25
Lehigh Slates, ₩ sqr.	8.00@ 4.50

Vermont:

Sea Green, ₩ sqr.	1.75@ 2.25
Purple, ₩ sqr.	3.25@ 4.00
Unfading Green, ₩ sqr.	3.25@ 3.75
Red, ₩ sqr.	8.00@ 9.75

Solder and Soldering Fluids—

Solder—

½&⅓, guaranteed.....11¢
No. 1.....8½@10¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.

In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

5 bbls., about 500 lb, ₩ lb	3½¢
½ bbls., about 300 lb, ₩ lb	4¢
Kegs, about 110 lb, ₩ lb	4¢
	75¢ extra for keg.
Kegs, about 55 lb, ₩ lb	4¢

5 % dis.

Yager's Soldering Salts.

¼-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter.....3¾¢@4¢
Bertha (pure).....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers. Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb	15@15½¢
Straits, pigs, ₩ lb	14½@15¢
Straits in bars, ₩ lb	15½@16¢

Tin Plates—

American Terne Plates—

N. B.—The following Terne Plate quotations are for 20 x 28, unless otherwise specified; 14 x 20 Plates are half the prices given below.

Alaska (re-squared) IC	$13.00
Alderly, extra quality, IC	10.75
Allegheny, IC	9.00
" IX	11.50
Anchor, IC	8.25
Apollo Roofing, IC	11.00
" " IX	13.00
Black Diamond (Extra Coated), IC	15.00
Bonus (Extra Coated), IC	11.50
" " " IX	14.50
Boston, IC	12.50
Brooklyn, IC	9.00
Capitol, IC	8.50
Central, IC	9.50
Climax, IC	8.75
Columbia, IC	12.50
" IX	15 50
Columbus, IC	9.50
Dunlap's Double Dipped, IC	15.00
" " " IX	17.00
" Domestic, IC	10.00
Empire, IC	10.25
Eureka, IC	9.50
" IX	12.00
Eureka, 200 lbs., IC	9.25
Excelsior, IC	9.50
Filbert, IC	14.5
Flag, IC	8.00
Florida, IC	9.50
Flusbing, IC	12.5
Freeport (Hand dipped and Resquared), IC	13.00
IX	15.50
F. R. P., Extra, IC	15.00
Globe, IC	8.50
" IX	11.00
Golden Star Old Style, IC	15.00
" " " IX	18.00
Grace, IC	8.50
Hamilton's Best Redipped, IC	15.50
" " " IX	18.50
Hickory (Resquared), IC	11 00
J. L. O., IC	9.00
" IC, 200 lb	8.50
Junlati, IC	8.50
Juno, IC	11.00
Kensington, IC	13.50
" IX	16.00
Knoxall, IC	9.00
" IX	12.00
Laufman's Apollo (Resquared), IC	13.00
Laufman's Apollo (Resquared), IX	16.50
Leominster, Extra Coated, IC	11.50
Lion (Stamped), IC	11.50
Lulu, IC	10.50
" IX	13.50
Maple, IC	11.00
" IX	14.00
Merchant's Roofing (Resquared), IC	15.00
Meurer's Old Method, IC	15.00
Meurer Roofing, IC	14.00
National, IC	11.00
Nava, IC	10.00
" IX	12.50
New Castle Old Method, IC	18.00
New Castle Palm, IC	14.50
Old Colony, IC	15.00
Old Method, IC	13.00
" IX	16.00
Osborn's Old Method, IC	13.00
Osborn's Old Process, IC	14.00
" " " IX	17.00
Osceola, Old Style, IC	14.50
" " IX	17.50
Pennsyl Old Method (Treble Coated), IC	14.00
Phillips' Roofing, IC	14.00
Phœnix, IC	9.25
Pullman, IC	11.50
Republic, IC	9.50
Scott's Extra Coated (Resquared), IC	16.00
Scott's Extra Coated (Resquared), IX	19.00
Standard, IC	8.50
Star IC	10.50
" IX	13.00
Superior, IC	9.00
Taylor Old Style (Resquared), IC	15.00
" " " IX	18.00
The Taylor Roofing, IC	13.50
" " IX	16.50
The Osborn Roofing, IC	11.50
" " IX	14.00
Thomson's Puritan, IC	14.00
Tip Top, IC (Resquared)	9.75
" IX	12.25
Triumph, Old Style, IC	15.00
" " IX	18.00
U. S. Monongahela, IC	12.20
U. S. Redipped, IC	16.50
Venus, IC	8 25
Waldo, IC, Hand-dipped	11.50
Westmoreland, IC	12.50
Willow, IC	10 00
" IX	13.00
Zero, IC	9.00

American Bright Plates—

Almond, IC, 20 x 28	$9.00
" IX, 20 x 28	11.50
Brilliant (Tissue Packed), IC, 20x28	16.50
" IX, 20x28	20.00
Brooklyn, IC, 14 x 20	5.50
Century, IC, 14 x 20	5.00
Climax, IC, 14 x 20	4.75
Excelsior, IC, 14 x 20	6.50
" IX, 14 x 20	7.50
Florence, IC, 14x20	5.50
Florida, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Gladys IC, 14 x 20	4.50
Golden Star (tissue pck.), IC, 14x20	6.00
" " IX, 14x20	7.50
Hazel, IC, 14x20	5.80
Ivy, IC, 20 x 28	12.00
" IX, 20 x 28	15.00
Linden, IC, 20 x 28	10.00
" IX, 20 x 28	12.50
Mars, IC, 14x 20	4.50
" IX, 14 x 20	5.50
Merchant's Dipped, IC, 14x20	10.00
Merion, IC, 20 x 28	11.00
" IX, 20 x 28	14.00
Mint, IC, 20x28	8.50
" IX, 20x28	11.00
New Castle Best Palm Charcoal, IC, 14 x 20	5 50
" " IX, 14 x 20	6.75
New Castle Palm Charcoal, IC, 14 x 20	5.00
" " IX, 14 x 20	6.25
New Castle, Charcoal, IC, 14 x 20	4.50
" " IX, 14 x 20	5.50
New Castle, S. Charcoal, IC, 14 x 20	4.25
" " IX, 14 x 20	5.25
New Castle Palm Coke, IC, 14 x 20	4.25
" " IX, 14 x 20	5.25
New Castle Coke, IC, 14 x 20	4.00
" " IX, 14 x 20	5.00
Oak, IC, 14 x 20	4.75
Osborn, IC, 14 x 20	4.75
" IX, 14 x 20	6.00
Palma, IC, 14x20	6.00
Pausy, IC, 20 x 28	10.50
" IX, 20 x 28	13.00
Phœnix, IC, 14x20	5.25
" IX, 14x20	6.50
Royal, IC, 20x28	12.00
" IX, 20x28	15.00
Silver Star, IC, 14 x 20	5.10
" IX, 14 x 20	6.50
U. S., IC, 14x20	7.25
Versailles, IC, 14 x 20	5.75
Walnut, IC, 14 x 20	4.65
Youghlogheny, IC, 14 x 20	6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20	$6.2
20 x 28	12.5
Pontymister Old Style Grade, IC, 14 x 20	5.50
20 x 28	11.00
IX, 14 x 20	6.50
20 x 28	13.00
Worcester Grade, IC, 14 x 20	4.50
20 x 28	9.00
IX, 14 x 20	5 75
20 x 28	11.50
Dean Grade.—IC, 14 x 20	4.25
20 x 28	8.50
IX, 14 x 20	5.50
20 x 28	11.00
Abercarne Grade.—IC, 14 x 20	4.00
20 x 28	8.00
IX, 14 x 20	5.50
20 x 28	11.00
Mansel Grade, IC, 20 x 28	8.00

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ lb.

Melyn and Calland Grade.	IC, 10 x 14	$5.25
" "	IC, 12 x 12	5.50
" "	IC, 14 x 20	5.25
" "	IC, 20 x 28	10.50
" "	IX, 10 x 14	6.50
" "	IX, 12 x 12	7.00
" "	IX, 14 x 20	6.50
" "	IX, 20 x 28	13.00
" "	DC, 12½ x 17	5.00
" "	DX, 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14	4.75
" "	IC, 12 x 12	5.00
" "	IC, 14 x 20	4 75
" "	IC, 20 x 28	9.50
" "	IX, 10 x 14	5.50
" "	IX, 12 x 12	5.75
" "	IX, 14 x 20	5.50
" "	IX, 20 x 28	1.00
" "	DC, 12½ x 17	4.25
" "	DX, 12½ x 17	5.00

Coke.

Steel Coke.—IC, 10x14, 14x20	4.25
10x20	6.50
20x28	8.50
IX, 10x14, 14x20	5.25
B. V. Grade.—IC, 10x14, 14x20	4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)	$11.50
IXX, 14x28..(112 sheets)	11.90
IXX, 14x81..(112 sheets)	13.25

Tinning—

Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—

Improved Lock Frame, per doz.	$15.00
Steel Lock Frame, per doz.	18.00
Daisy Improved Pattern, ₩ doz.	18.00

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and under, Plain	70%
1¼ and under, Galv.	64%
1⅛ and over, Plain	77%
1⅛ and over, Galv.	68%
Boiler Tubes	75@77½%
Screw and Socket Joint Casing	65%
Inserted Joints Casing	60%

Zinc—

600 lb casks.....₩ lb 4¾¢
Per lb.....5¼¢

It Is Reported—

Colorado.

That A. G. Sherwin has disposed of his Hardware store, at LOGAN, to Frank Phillips. Mr. Sherwin will, however, continue in the coal and lumber business.

Illinois.

That the partnership between C. R. Rogers and J. H. Vawter, under the firm style of Rogers & Vawter, SALEM, has been mutually dissolved. Mr. Vawter will continue the Hardware business and Mr. Rogers the produce business.

That Keator & Thompson are a new Hardware firm at PAXTON.

That James Glanville has bought out Frank P. Voght in the Hardware business at STOCKTON.

That J. W. Shuck has disposed of his Hardware business at URBANA to W. I. Saffell.

That E. S. Hubbell, in the Hardware business at THAMESVILLE, has been succeeded by Hambly & Hodgson.

That J. L. Drainie, Hardware, FERGUS, has sold out to Nichols & Co.

That George A. Trotter, Hardware merchant of COAL CITY, has purchased the Hardware store of Thomas Jack at SPRING VALLEY. Ford Cumming, who has been in Mr. Trotter's employ at COAL CITY, has been placed in charge of the SPRING VALLEY store.

That J. M. Hart's Hardware store at MINIER was burglarized on the 28th ult. About $200 worth of goods were taken away.

That L. Beringer, Hardware dealer, 1611 Wabash avenue, CHICAGO, has been robbed so frequently of late that he is thinking about going out of business before the thieves carry away all his goods. He estimates his losses at $1500.

Indiana.

That William P. Ritterskamp & Co., VINCENNES, have sold their Hardware store to E. A. Ritterskamp of BICKNELL and August Meise of VINCENNES. The new firm will be known under the style of E. A. Ritterskamp & Co.

That Clingenpeel & Krauss' Hardware store, at FLORA, was consumed by fire on the 6th inst.

That William Cover has purchased the interest of his partner, Lee Fishbaugh, in the Hardware business, at MARKLE, and will continue the store under his own name.

That Monroe & Holloway's Hardware store at NEW CASTLE was burglarized on the 7th inst.

Iowa.

That Louie Peterson, a farmer of PARKER, has traded his farm and live stock for a Hardware store at GILMORE.

That the Lone Tree Hardware Company, LONE TREE, have sold their store to Geo. Silverly.

That White & Van Patten are building an addition to their Hardware store at HUBBARD.

That Herman DeKraay of the firm of DeKraay & Rozeboom, Hardware merchants, ORANGE CITY, has sold his interest in the store to John H. D. Hartog.

That the Hardware firm of Rohenkohl & Duke, WATERLOO, have dissolved partnership. C. M. Newton has purchased Mr. Duke's interest.

That J. Wise's Hardware store, at DOW CITY, was destroyed by fire on the 26th ult.

That James Sciscoe and D. N. Wilson have opened a new Hardware store at MEDIAPOLIS.

That J. W. Thompson, BRITT, has nearly completed his new Hardware store.

That EAGLE POINT has a new Hardware store, conducted under the style of Scholz & Wimmer.

That S. B. Lattner has sold his Hardware store, at WORTHINGTON, to M. Kremer and H. Fiedler.

Kansas.

That the store of the Axtell Hardware Company, AXTELL, was consumed in a large fire at that place on the 12th inst.

Massachusetts.

That Henric C. Fay is successor to L. C. Parmenter & Co. in the Hardware business at ATHOL.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

PATTERN MAKER on iron patterns; one who understands his business and would be willing to make himself generally useful around a foundry; a man living in Brooklyn, N. Y., preferred; state full particulars and salary wanted. "Roe," No. 42, office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 23

TRAVELING MAN to represent a line of cooks, ranges and heaters in States of Ohio, Indiana and Illinois. "Stoves," office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. Mar. 23

A boy with two or three years' experience at plumbing; one who can do some jobbing prefered, and who will make his home with his employer. E. J. McGinley, 2249 Richmond street, Philadelphia, Pa. Mar. 16

A steady man who can do first-class work at plumbing and general country jobbing; one having a knowledge of tinning and roofing preferred. Day & Holt, Catskill, N. Y. Mar. 16

A practical PLUMBER and FURNACE HAND; steady work to the right man; state wages wanted; reference required. "T. A. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

TRAVELING SALESMAN for large assorted line stoves; modern goods; on commission. "Stoves," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 16

A first-class PLUMBER, TINNER and FURNACE SETTER; a steady job and good wages to the right person; must be strictly temperate. Call on or address E. C. & J. R French, Dryden, N. Y. Mar. 16

A competent TINSMITH with some business ability; one with a fair knowledge of plumbing, who could take part interest in business; have a line of good work; first-class tools and machines; pleasant and well lighted shop, in the healthiest and pleasantest town in Western New York; good opportunity for the right man. "O. K.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

A wide-awake SALESMAN having a knowledge of the furnace business, to sell a special heating apparatus on liberal commission; a good opening for the right man; give age, experience and reference. "Pure Air," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 16

SITUATIONS WANTED.

By a strictly temperate and reliable TINNER of eight years' experience at inside and outside work, roofing, spouting, general jobbing, &c.; furnace work a specialty, also some knowledge of plumbing and pipe fitting; city or country. "Tinner," Box 83, Woodstock, Ont. Mar. 23

By an experienced PLUMBERS' HELPER under instruction; am fair jobber and good wiper; would like situation where can get experience on new work; willing to go any place. "Helper," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 23

In the country, by a TIN and SHEET IRON WORKER; 16 years' experience. Henry Newburgher, 212 Eldridge street, New York City. Mar. 23

By a FOREMAN; thoroughly understands the manufacturing of stoves, ranges and heaters; had 13 years' experience as foreman of foundries, also wood and iron pattern departments; reference. "L. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 23

By a practical STEAM and HOT WATER FITTER; a steady position; can do a fair job of plumbing; would accept position as foreman over steam and hot water fitters; can give references. "Steam Fitter," 122 Scioto street, Portsmouth, Ohio. Mar. 23

A practical STEAM and HOT WATER FITTER wishes a position as salesman on the road for some boiler or radiator firm; I understand making estimates and drawings, or would accept a position as foreman of construction of heating apparatus; am engaged at present with a large firm; I can give references. "Salesman," 122 Scioto street, Portsmouth, Ohio. Mar. 23

By a TINSMITH; 15 years at the trade; roofing, heater, range and furnace work; city or country. C. Conklin, 276 Seventh street, Jersey City, N. J. Mar. 23

By a Boston licensed PLUMBER who understands furnace, roofing and general work; also steam and hot water heating; 30 years of age; temperate; not afraid of work; state wages Jas. A. Reber, Beverly, Mass. Mar. 23

By a general jobbing TINNER at inside and outside work, furnace work and piping; would like steady work; city or country; married man. George Myra, Box 487, Bethel, Conn. Mar. 23

By a PLUMBER; first-class on lead or iron; steady and reliable. Jos. C. Slattery, 515 Broadway, Albany, N. Y. Mar. 23

SALESMAN having experience in tinners' supplies in eastern and southern Pennsylvania and northern Maryland, would like to connect himself with a reliable tin plate house handling same line; can control his present trade; references if necessary. "J. G. H.," P. O. Box 303, Reading, Pa. Mar. 23

By a molder, 15 years' practical experience on stoves, ranges, portable steam and hot water heaters, eight years as manufacturer in the South; would like a position as MANAGER or SALESMAN; best of references; South preferred. Wm. McDonell, Jr., 1530 N. Sixth street, Philadelphia, Pa. Mar. 23

By a TINSMITH: first-class mechanic in every branch; experienced in country work; sober; good reference; wish a steady position. Barney Maurer, 63 Lewis street, New York City. Mar. 23

Steady employment by a young married man of seven years' experience in tin, sheet iron, stove and furnace work and tin roofing; fair knowledge of plumbing and piping; sober habits; speaks English and German; Massachusetts preferred. F. Kemnitzer, 8 Birch street, Clinton, Mass. Mar. 23

By a man who has had long experience at plumbing, gas, steam and hot water fitting; can lay out work and estimate from plans; will go to any part of the country; West preferred. Jno. R. Talor, Indianapolis, Ind. Mar. 23

By a young man, as PLUMBER, in city or country; wages moderate. O. Bormann, 1325 Second avenue, New York City. Mar. 23

As CLERK in a hardware and tin store, by a young man 19 years of age; five years' experience at the retail trade; can help at the bench; willing to board with proprietor; can give good references. Edwin Jackson, Box 412, Tuscola, Ill. Mar. 23

By a good TIN and SHEET IRON WORKER and GENERAL JOBBER on all kinds of tin and sheet iron work; a steady job; 18 years' experience; married and sober. "Tinsmith," 242 North Second street, Brooklyn, E. D. Mar. 23

By a first-class PLUMBER; 15 years' experience; city or country; best of reference. P. M. Shea, 199 East Seventy-sixth street, New York City. Mar. 23

By a first-class PLUMBER; city or country. C. J. Smallen, 64 W. 101st street, New York City. Mar. 23

By a young man 21 years of age, three years' experience at the plumbing trade, a situation where he can learn to do first-class work; wages no great object; city preferred. 121 Cranberry avenue, Harrisburg, Pa. Mar. 23

By a SLATE ROOFER; first-class mechanic at every branch of the trade; capable of taking charge and not afraid of work; steady and sober; best of reference; has held seven years' position as foreman. H. H. Slater, 722 Columbia street, Hudson, N. Y. Mar. 23

By a first-class TIN and SHEET IRON WORKER; understands furnace and range work and roofing; 12 years' experience; moderate salary; city preferred. Jno. Moran, 206 West Sixtieth street, New York City. Mar. 23

By a practical SLATE ROOFER, with 20 years' experience in all branches of the slate, tile, tin and gravel roofing business; some knowledge of cornice work; experienced in all kinds of gutters and eave trough; an all round mechanic; handle men and estimate from plans; sober, steady, first-class worker; good reference; would like a position for the season, or make a contract for one year. F. B. Dachdecker, 722 Columbia street, Hudson, N. Y. Mar. 23

As SUPERINTENDENT or FOREMAN for erection of structural iron work; able to do any kind of rigging and finishing work; first-class mechanic; A1 at plans; best of references. Ernst Krampff, 108 Utica avenue, Brooklyn, N. Y. Mar. 23

By a TINNER of six years' experience in stove, hardware and tin business; have set of tinner's tools and at liberty to make engagement now for a year or longer; good references; state wages and line of work. "Tinner," Lock Box 5, Kalona, Iowa. Mar. 23

By a first-class HOT WATER and STEAM FITTER; also a licensed plumber; age, 27; can furnish reference; would go anywhere in the United States. "J. T. D.," 52 Buckingham street, Hartford, Conn. Mar. 23

By a good all round TINNER who has been at the tin and hardware business ten years; good hand at furnace work, roofing, spouting, repairing; also understands bicycle repairing; single; age, 26; speaks English and German; honest, steady and sober; best references; city and country. "Tinner," care of M. E. Rowe & Co., 135 Lake street, Chicago, Ill. Mar. 23

By a practical mechanic of 30 years' experience in the hot air, hot water and steam fitting trades; has had charge of shops for 20 years, where plumbing, tinning, cornice work, steam and hot water fitting has been done; understands and can make drawings, estimate and superintend all of the above branches; a position as FOREMAN, SUPERINTENDENT or TRAVELING SALESMAN; best of reference given. "J. N. O.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 23

By a first-class TIN and SHEET IRON WORKER, thoroughly reliable on heater, range and roofing work; good reference. "H. F. M.," 3857 Coral street, Philadelphia, Pa. Mar. 23

By two first-class TINSMITHS in every branch of the trade; understand plumbing; can take charge of work; steady job desired; city or country. F. Kleyla, 415 West Thirty-sixth street, New York City. Mar. 23

By a first-class NICKEL PLATER, with five years' experience; the best of reference furnished. "C. W.," 507 Otisco street, Syracuse, N. Y. Mar. 23

By a first-class PLUMBER, on new work or jobbing; one who thoroughly understands his business and can give references; wants a job anywhere. F. F. Walsh, 324 East Fortieth street, New York City. Mar. 23

Steady position, by a PLUMBER and GAS FITTER; strictly sober and reliable; married; wages moderate. Henry W. Bauer, Wakefield, N. Y. Mar. 23

By a young man, 24 years of age, who has had six years' experience at tin and ironwork, stove repairing and furnace work; some knowledge of gas fitting; steady position wanted; can furnish best of references. P. O. Box 91, Caneadea, Allegany County, N. Y. Mar. 23

As TRAVELING SALESMAN with some stove house having a complete line of stoves, ranges, &c., or with some jobbing house handling a full line of tin plate, stamped ware and tinners' stock; has a good established trade of 20 years' standing in Pennsylvania, Ohio, Indiana, Illinois and Michigan. "S. S.," 323, office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 23

PLUMBER and GAS FITTER, strictly first-class mechanic, desires work in city or country; would take charge or work journey work; understands plans thoroughly; can assist estimating; 18 years' experience; strictly sober and reliable; can furnish best of references; willing to go anywhere. E. Usher, 425 East 114th street, New York City. Mar. 23

By a BLACKSMITH; one who understands all branches; steel work or machine forging. "M. A. S.," 21 Division street, Brockton, Mass. Mar. 16

By a first-class TINSMITH; able to work on copper, brass, iron and tin; city or country; please state wages. Wm. Bartels, P. O. Box 531, Susquehanna, Pa. Mar. 16

Steady situation as STEAM, GAS and HOT WATER FITTER; ten years' experience at house heating and school house work; would prefer a place to look after jobs or learn to figure on work; would go on trial; strictly temperate. P. O. Box 297, Worcester, Mass. Mar. 16

A German, five weeks in this country, offers his services to any one desiring an A1 MECHANICAL ENGINEER, who has graduated in Germany; is 27 years of age and understands the English and French languages. P. Oppenichem care Mr. Boelkow, 252 East Seventy-, ghth street, New York City. Mar. 16

By a first-class PATTERN FILLER who can also do mending and fitting; can give first-class references. "J. C. L.," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. Mar. 16

By a first-class TIN and SHEET IRON WORKER; best of reference. H. M. Clark, 371 South Fifth street, Brooklyn, N. Y. Mar. 16

Steady situation as CLERK in the house-furnishing, tin and hardware business; eight years' experience; 25 years of age. "Hardware Clerk," Box 54, Williamsbridge, New York City. Mar. 16

Special Notices.

Desirable Business Opportunity For Sale.

A rare chance to purchase an old established business. Foundry buildings comparatively new, with modern improvements for making light or heavy castings. Capacity 65 to 80 moulders. Products delivered by truck without change to any part of New York, Brooklyn or Jersey City. Full line of valuable patterns and flasks (not machinery) Necessary machinery to do an extensive business. Buildings ample for business purposes and storage Constructed in the best manner, equipped with automatic sprinklers and heated with steam A large wharf for handling goods and supplies by water. Location unexcelled for convenience. For further information address

"SELLER."

office of *The Metal Worker*, 96-102 Reade Street, New York.

FOR SALE.

An established roofing, tinning, plumbing and stove business, located at New Hamburg, N. Y., including the buildings occupied, well arranged for the business; no competition; good reasons for selling; stock will inventory about $1250. Address

WM. C. SHAY,
New Hamburg, N. Y.

FOR SALE.

Good plumbing, heating and roofing business, in good town, thirty miles from New York; city water supply, gas, etc.; will be sold cheap. Complete set of tools and machines. Stock low. Large store and shop at low rent. Address "Good Town," office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

A set of Tinners' Tools and Machines. All new and first-class. Address "DEALER," office of *The Metal Worker*, 96-102 Reade Street, New York City.

TO TAKE INTEREST.

Wanted, a plumber and steam fitter with about $800 to invest, as a partner in old established business in the South. Address "SOUTH," office of *The Metal Worker*, 96-102 Reade St., N.Y.

TINNERS

and others who wish to manufacture on royalty the Novel Lid Hand Handle Holder for tea kettles, write to D. O'LEARY,
Winchester, Cal.

WANTED.

To correspond with some party who has money to invest in a good manufacturing business. Articles manufactured are patented in the United States, the patent rights for the States of California, Washington and Arizona for sale. Address

INDIANA LADDER COMPANY,
Indiana, Pa.

WANTED.

A second-hand 8-ft. Cornice Brake. Must be in good condition. State price, maker's name and length of time in service, and cash price f.o.b. cars at shipping point.

H. W. KAISER,
2300 Gravois Ave., St. Louis.

WANTED.

Good second hand 30-inch folder. Also Robinson's double end folder.

P. O. BOX 338,
Pittsburgh, Pa.

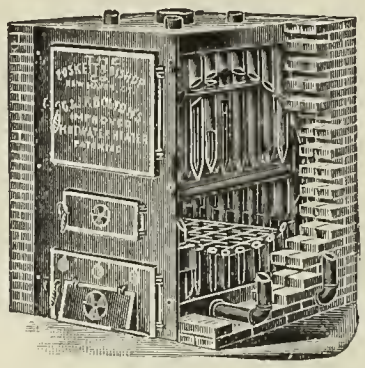
A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

G. & J. R. BOLTON HEATERS.

HOT WATER.



STEAM.

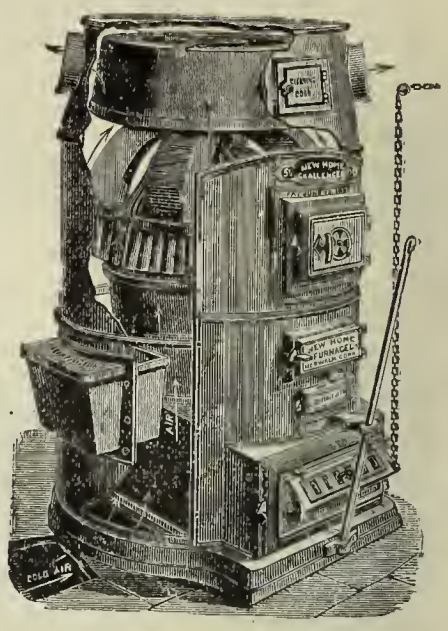
The Foskett & Bishop Co.,

MANUFACTURERS.

The Best Heating Apparatus in the World.

END FOR PRICES, ETC.

New Home HOT AIR FURNACES.



NEW HOME FURNACE CO.,
NORWALK, CONN.

SALESROOM:

George H. Raymond, Manager, 114 Liberty St., New York.

Special Notices.

FOR SALE.

A rare chance to buy a paying Stove and Tinware store in a finely located New England town. Have a good Steam Fitting, Plumbing, Tin and Sheet Iron trade. Good reasons for selling. Address

"RARE CHANCE," No. 314,
office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

A tin, stove and hardware business, doing a good trade, will be sold for cash at a reasonable price; good reasons for selling. Address

"REASONABLE,"
office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE or TO LEASE.

An established Plumbing and House Furnishing business at Narragansett Pier, R. I. Inquire of W. H. GRIFFITH & CO., on premises, or address D. D. CLARK, Westerley, R. I.

FOR SALE OR EXCHANGE.

A 6-foot Robinson Cornice Brake for sale, or will exchange it for one 8 or 10 feet long of the same make; is in good condition. Address

CHRISTIAN OFF & CO.,
230 East Washington St., Indianapolis, Ind.

FOR SALE.

No. 7 Sturtevant Blower, only short time in use. Address

EUGENE MUNSELL & CO.,
218 Water St., New York.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

Cast Iron Patterns of Furnaces, Ranges and Fire Place Heaters as follows: 11 sizes Furnaces, 4 sizes Ranges, 1 size Fire Place Heater. Address

ALVA HUBBARD & CO.,
Baltimore, Md.

Special Notices.

WANTED.

Line Hard Coal Base Burner for season '95 by stove manufacturing company not making them, to handle in connection with their own, who thoroughly and actively canvass the territory of Ohio, Indiana, Michigan, Illinois and Wisconsin. Address

"HARD COAL,"
office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

The proprietor of a well equipped Stove Foundry, being engaged in another business to which he is required to give most of his time, desires to dispose of the foundry. Melting capacity, nine tons. Very favorably situated as to supply of material and labor and with splendid facilities for distributing to any section of the country. Address "FOUNDRY," Box 39, office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

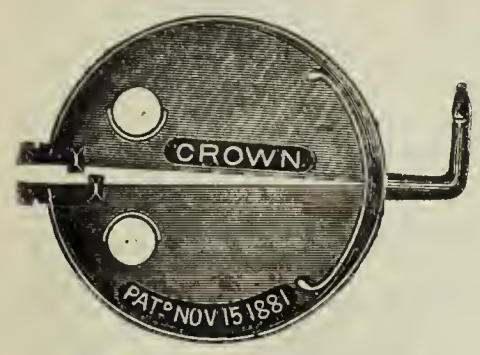
D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

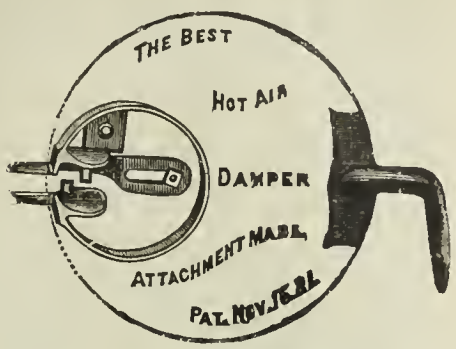
PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

Crown Damper and Crown Damper Attachment.





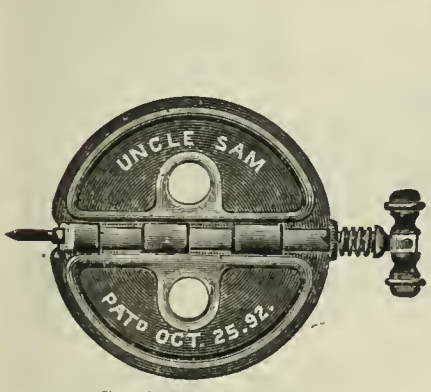
NICKEL PLATED HANDLE. **PUT UP 1 DOZ. IN A BOX.**

—MADE BY—

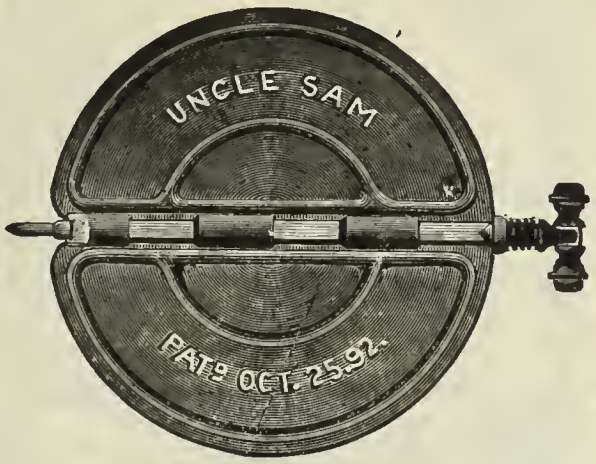
W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada.

Uncle Sam Dampers.



Smoke Pipe Damper.



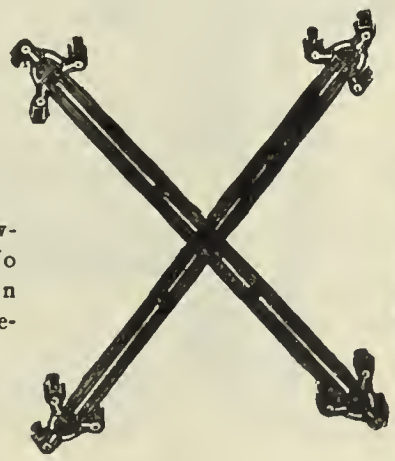
Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers





THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.

Gray Iron Castings,

Cheap Heating Stoves,
Diamond Thimbles.

S. CHENEY & SON,

MANLIUS, N. Y.

FOUNDRY FOR SALE

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows : One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first-class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first-class foundry.

Address

"STOVE FOUNDRY,"

Office of *The Metal Worker*, 96-102 Reade Street, New York.



SOMETHING NEW.

The Little Giant Steel Truck. Strong, Light.

ENTIRELY OF

METAL AND AT A VERY

LOW PRICE.

Write for Circulars and Prices to the Manufacturers,

THE G. L. VAN NAMEE MFG. CO.,

Gouverneur, N. Y., U. S. A.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. **Expert** searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.

PATENT PRACTICE EXCLUSIVELY.

References Furnished on Application.

E. B. STOCKING, Attorney at Law,
611 F ST., N. W., WASHINGTON, D. C.

ESTABLISHED 1853.

HOWSON & HOWSON,

Counsellors at Law,

Solicitors of Patents.

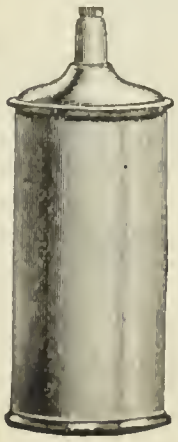
OFFICES:

PHILADELPHIA,
Forrest Building, 119 S. 4th St.
NEW YORK,
Potter Building, 38 Park Row.
WASHINGTON,
Atlantic Building, 928 F. St.



The largest and best assorted stock in America. All requisites for the draughting room. We have made a study of this line and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable.

CATALOGUE ON APPLICATION.



This little Torch is 4 in. high and 1¼ in diam. and is designed to do away with the greasy candle. Will burn gasoline or kerosene oil.

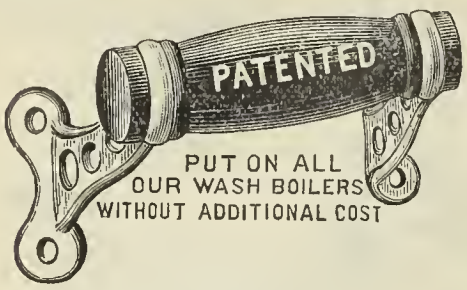
Sold by All Jobbers.

Kendrick Valve & Washer Co.,

SYRACUSE, - N.Y.

ROYAL

WASH BOILER HANDLE



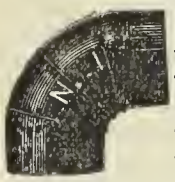
PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

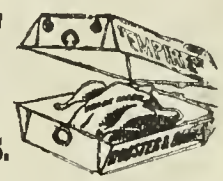
The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,
116 N. 2d St., PHILADELPHIA, PA.

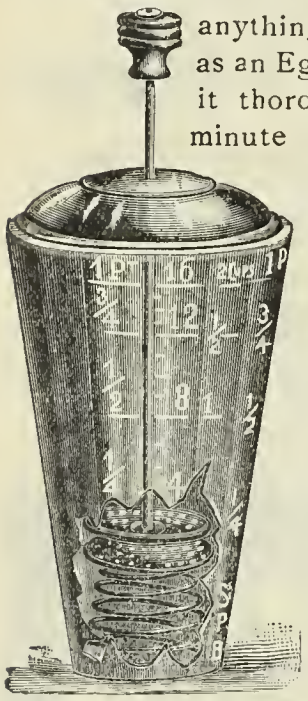
NEW YORK ELBOW CO.
18 Cliff St., N. Y. City.



Makers of
Elbows
AND
Roasters.



It Beats



anything you ever saw as an Egg Beater, does it thoroughly in one minute Beats, strains, measures and a host of other things it does. The best seller ever introduced. Is clean and very cheap.

Write for Prices in Lots.

Lightning Dasher
Egg Beater Co.,
Toledo, Ohio.

THE TRIUMPH COOKER,
WITH LOCK COVER.
STEAMLESS, ODORLESS AND NON BOIL-OVER.
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.



A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers

THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN.

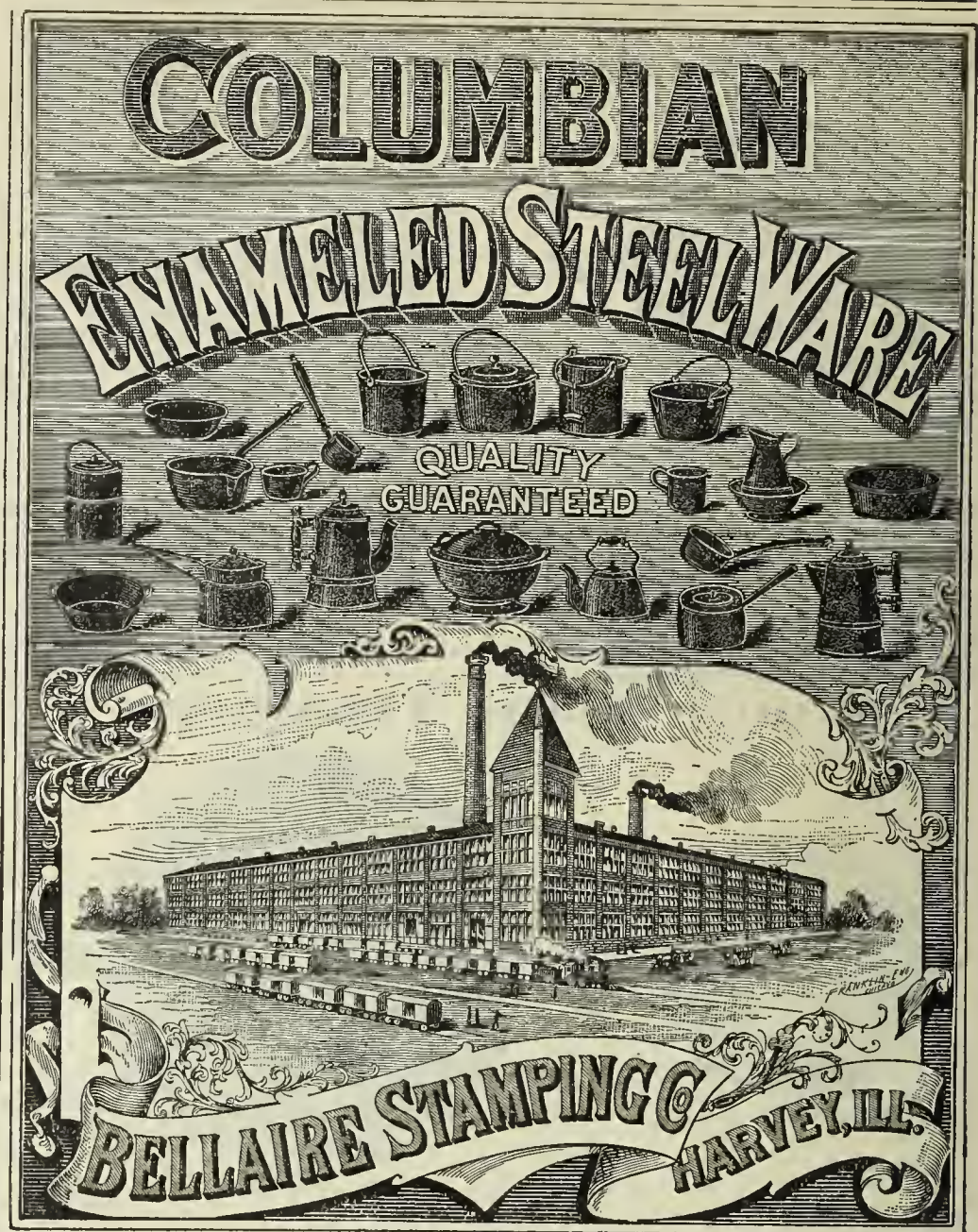
— THE STOCK GIBE.—A dispute over a vagrant kitten had arisen between the two boys. "Obverse or reverse?" said the Boston bootblack, taking a 1-cent coin from his pocket and flipping it up in the air.—*Chicago Tribune.*

— EASIER TO MANAGE.—Judge: "You are charged with hog stealing."

Prisoner: "Yes, suh."

"Couldn't you find anything else to do?"

Prisoner: "Well, suh, I might er stole a cow, but dey's mo' trouble to manage den hogs is."—*Atlanta (Ga.) Constitution.*



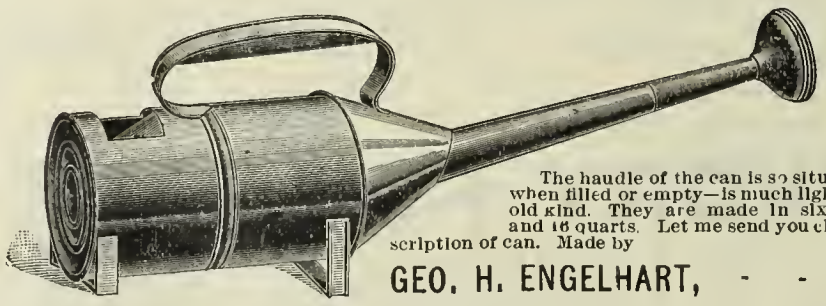


CLARK'S NEW FAUCET
— FOR —
MILK and CREAM CANS, ETC.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

This Cut is 2-3 the Size of Faucet.

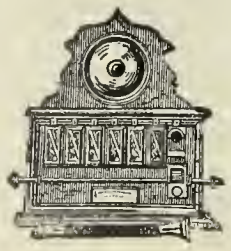
MANUFACTURED BY
The Clark Novelty Co.,
ROCHESTER, N. Y.



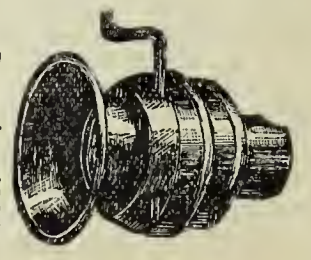
The Standard Watering Pot.

The handle of the can is so situated that it balances when filled or empty—is much lighter to carry than the old kind. They are made in six sizes—6, 8, 10, 12, 14 and 16 quarts. Let me send you circular giving full description of can. Made by

GEO. H. ENGELHART, - - Glenville, O.



W. R. OSTRANDER & CO.,
204 FULTON STREET, NEW YORK.
Manufacturers of
Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.
Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.



THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,



Japanned, Pieced, Heavy Polished Ware,
Planished, Britannia, Galvanized and Japanned
Sheet Iron Ware,
Stove Boards, Elbows, Etc.

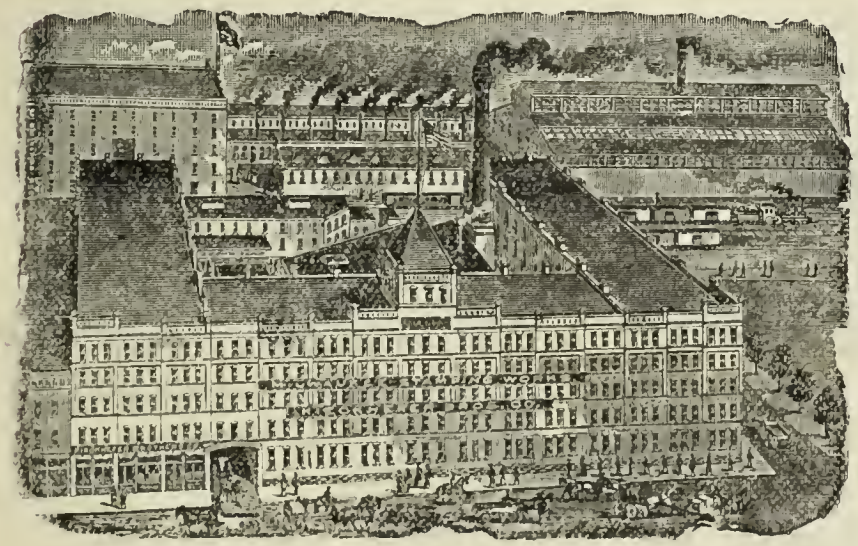


Agents for SPLENDID OIL COOKING STOVES
and MAJESTIC OIL HEATING STOVES

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED,
JAPANNED AND ENAMELED
PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., MILWAUKEE, WIS.

SEND FOR CATALOGUE AND PRICES.



American

WAFFLE IRONS.

The Best for Gas or Gasoline Stoves Easy to Clean. Long Wood Handles.

Buy no Other.

"ERIE" HOLLOW WARE LEADS, ALL OTHERS FOLLOW.

ALSO COMPLETE ASSORTMENT OF

FULL NICKEL PLATED WARE,

UNSURPASSED IN FINISH.

"ERIE" ALUMINUM CAST WARE,

THE FINEST WARE EVER MADE. IT WILL PAY YOU TO HANDLE IT.

NEW GOODS FOR SPRING TRADE.

SEND FOR NEW CATALOGUE.

Try our Improved Double Broiler for Gas or Gasoline Stoves.

GRISWOLD MFG. CO., Erie, Pa.



"ERIE" ALUMINUM.

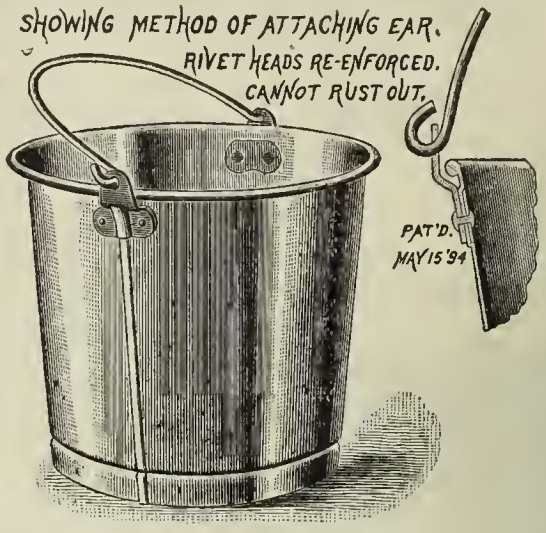


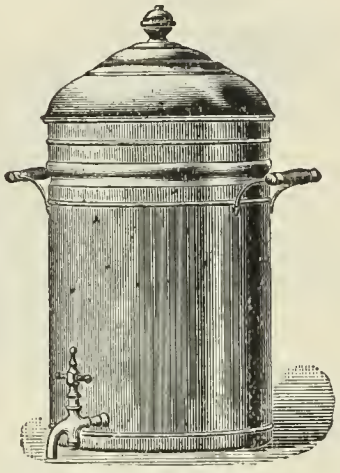
LATEST "ROCHESTER."
Patent pending.
White Satin Finish Inside.



"ROCHESTER." Patented.

ROCHESTER STAMPING WORKS,
Rochester, N. Y.,
STILL MAKE
NO TIN COVERS ON ANY OF OUR PLATED WARE.
Better Goods Than Ever.





"ROCHESTER" COFFEE URN.
Extra Heavy Copper, Nickel Plated.
Cold Handles, Riveted on.



"ROCHESTER." Patented.



"ROCHESTER" OLD STYLE.
EXTRA HEAVY.
White Satin Finish Inside.

The Crystal Valve Oil Can.



The Best to Buy,
The Best to Sell,
The Best to Use.

Patented Combination Valves. Fire proof. New Design. Made expressly to please the people.

Write for '95 Circulars.

STAR MFG. CO., Canton, O.

ANTI-RUSTING. C. S. Mf'g Co. WARRANTED.

WE WISH IT distinctly understood by all the hardware dealers, and also dealers in Tinware, throughout the United States that the

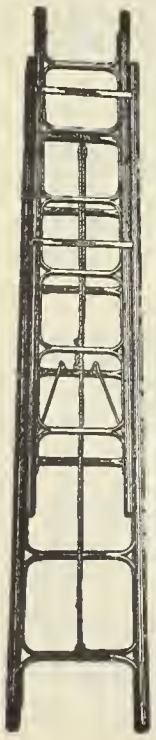
CLIFTON SPRINGS MANUFACTURING COMPANY,
CLIFTON SPRINGS, N. Y.,

is still in existence, shipping large quantities of the

Evans Patent Anti-Rusting Tinware

(trade-mark, a Greek Cross), notwithstanding the base falsehoods heralded about the country by the salesmen of our competitors.

Look at this Ladder.



THE PATENT BENT RUNG LADDER.

The Strongest, Lightest and Best Ladder Made.

A sixteen-foot ladder only weighs 21 pounds. Extension ladders of this kind are easily put up and taken down by a boy. Our double and single step ladders have no equal. A six-foot step ladder will carry 1000 pounds, and will last three times as long as the old style step ladder.

Write for catalogue and price-list.

Indiana Ladder Co.,
INDIANA, PENNSYLVANIA.

WEST'S DUST PAN,



Patent applied for.

the daintiest, handsomest, cleanest, cheapest and most convenient Dust Pan in the world.

You see, I don't have to get on my knees or break my back or split my dress, etc., stooping, or smother myself with dust when using this Dust Pan.

I just place my foot on the tread, thus, while I sweep the dust into the pan and carry it away like this, so the dust can't spill out.

I guess it will last my lifetime although it costs only ten cents.

This is our new Dust Pan.



Patent applied for.

For sale by all jobbers.

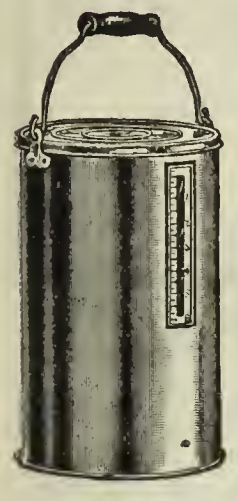
Write for Prices.

JAS. R. WEST, Man'f'r, - - Gas City, Ind.

CREAM CANS

. . . AND . . .

Cream Can Trimmings.



Cream Cans

With Plain Covers.
With Deep Covers.
With Extra Deep Covers.
Self Locking.

Fairmont Cream Can Gages.



Cream Can Trimmings.

Cream Can Bottoms—IX, IXX, IXXX.

Cream Can Covers—Plain, Deep, Extra Deep.

Self Locking Trimmings—Ears and Lugs; Ears, Lugs and Bails.

The Geuder & Paeschke Mfg. Co.

Manufacturers,

MILWAUKEE, WISCONSIN.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handlest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

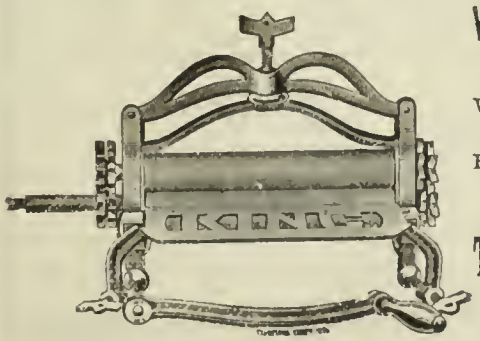
Weight, 16 ounces.
Length, 10 inches.

Can be sold in all seasons.

Write to Manufacturers for Prices.



WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

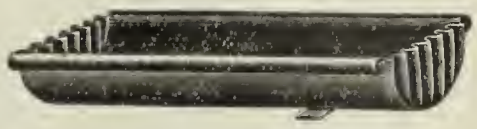
Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr
Boston Office, H. F. Livermore & Co., 34 Oliver St.

"We are Advertised by our Loving Friends."



Pat. Feb. 26, 1895.

Look Here,

Hardware and Housefurnishing Dealers. An article you **must** keep is the wonderfully popular

Crusty Bread Pan.

The most perfect bread baker ever made. Every lady trying it acknowledges that. **Tests make customers** for this pan, and **that is a fact.** The Clark-Sawyer Co., a big Department Store of Worcester, Mass., say: "They are a good thing, and will make their own way, if people can be made to give them a trial." Your jobber must be in the list below. Write them for prices. They all carry this popular pan in stock.

MADE ONLY BY

The Niles Mfg. Co.,

NILES, OHIO.

HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ill.
HORTON, GILMORE, McWILLIAMS & CO., Chicago, Ill.
WM. FRANKFURTH HARDWARE CO., Milwaukee, Wis.
JOHN PRITZLAFF HARDWARE CO., Milwaukee, Wis.
FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.
R. D. CONE CO., Winona, Minn.
A. F. SHAPLEIGH HARDWARE CO., St. Louis, Mo.
RICHARDS & CONOVER HARDWARE CO., Kansas City, Mo.
WYETH HARDWARE & MANUFACTURING CO., St. Joseph, Mo.
THE GEORGE TRITCH HARDWARE CO., Denver, Colo.
EMPKIE-SHUGART CO., Council Bluffs, Iowa.
SICKELS, PRESTON & NUTTING CO., Davenport, Iowa.
A. BALDWIN & CO., Limited, New Orleans, La.
FITTEN-THOMPSON HARDWARE CO., Atlanta, Ga.
PHILLIPS & BUTTORFF MANUFACTURING CO., Nashville, Tenn.
STRATTON & TERSTEGGE, Louisville, Ky.
THE F. H. LAWSON CO., Cincinnati, Ohio.
VAN CAMP HARDWARE & IRON CO., Indianapolis, Ind.
STANDART BROTHERS, Detroit, Mich
THE GEO. WORTHINGTON CO., Cleveland, Ohio.
THE McINTOSH-HUNTINGTON CO., Cleveland, Ohio.
L. H. SMITH WOODEN WARE CO., Limited, Pittsburgh, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
CHARLES MILLAR & SON, Utica, N. Y.
BARKER, ROSE & GRAY, Elmira, N. Y
SHIELDS & BROTHER, Philadelphia, Pa.
C. S. MERSICK & CO., New Haven, Conn.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, etc.

"A FULL LINE AND SUPERIOR GOODS."

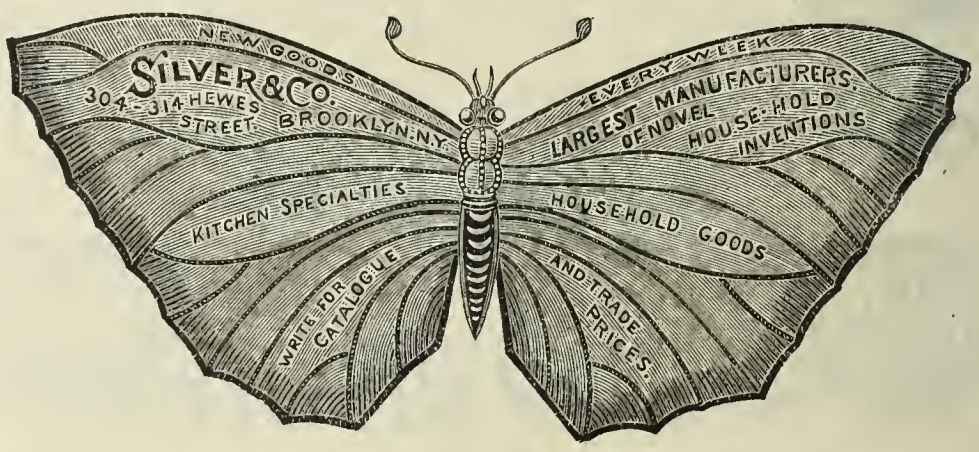
Write us for Catalogue and Prices.



ROME MFG. CO., Rome, N. Y.

New York Store, 92 Walker St.





EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES,

"MARION HARLAND" Tea and Coffee Pots and Urns.

Royal and Crown Roasters and Bakers

Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses,

Steam Cookers, Milk Sterilizers, Bread and Cake Pans,

Display Stands and Household Novelties.



Buy Iwan's Volcano Revolving Ventilating Chimney Top

The best in the World

For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.

FOR SALE BY

Berger Bros., Phila., Pa.
Garry Iron & Steel Roofing Co, Cleveland, O.
Cincinnati Stamping Co., Cincinnati, O
Illinois Roofing & Supply Co, Chicago, Ills.

IWAN BROS.

Sole Mfrs., Streator, Ills.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

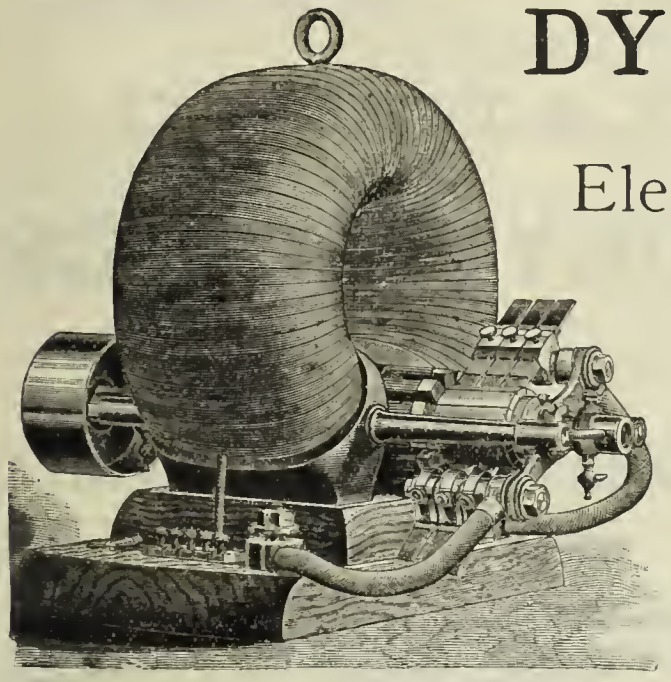
MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods.☜

NICKEL PLATING OUTFITS.

ZUCKER & LEVETT & LOEB CO.
8 TO 14 GRAND STREET,
NEW YORK, U. S. A.

SEND FOR CATALOGUE OF
NICKEL & ELECTRO-PLATING SUPPLIES & POLISHING MATERIALS.



DYNAMOS
—FOR—
Electro-Plating,

NET PRICES:

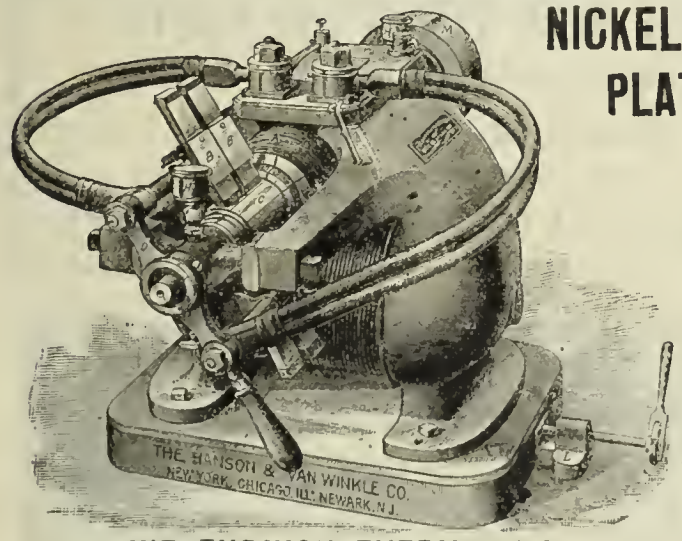
No. 0,	200	Gallons, Nickel,	$100
No. 1,	600	" "	200
No. 2,	2000	" "	400

—THE—
Eddy Electric Mfg. Co.,
Windsor, Conn.

ESTABLISHED 1820. INCORPORATED 1891

The Hanson & Van Winkle Co.,

MANUFACTURERS OF
NICKEL AND ELECTRO PLATERS' MATERIAL.



Nickel-Plating Outfits
From $20 Upward.

DYNAMO-ELECTRO MACHINES
For all purposes.

The New H. & V. W. Dynamo Machine.
In sizes from No. 1 to No. 5.
FROM $100 TO $800.

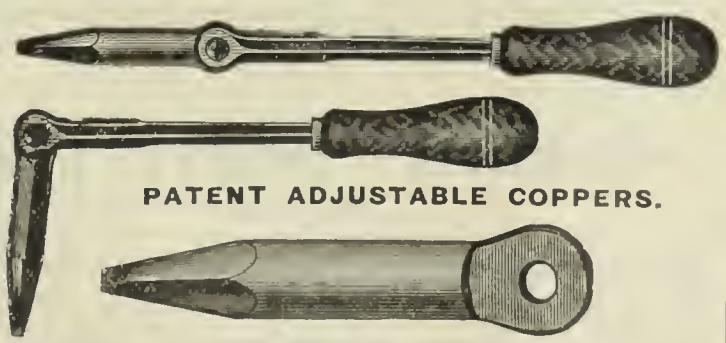
These machines will be placed on 30 days' trial with responsible parties, and if not satisfactory may be returned at our expense. Guaranteed 30 % more powerful than any machine in the market at same price.

219-221 Market St., Newark, N. J.
81 Liberty St., New York.
35-37 South Canal St., Chicago, Ill

WE FURNISH EVERYTHING.

Covert Pat. Adjustable Soldering Irons and Coppers

It is a complete tool in every respect, and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.



PATENT ADJUSTABLE COPPERS.

☞A sample of ⅞ in. soldering iron will be sent by mail, free of postage to any address, on receipt of sixty cents (60c.).

FOR SALE BY ALL GENERAL HARDWARE AND PLUMBERS' SUPPLY HOUSES.

COVERT MFG. CO., - West Troy N. Y.

SECOND EDITION.

PRACTICAL HINTS
—ON—
JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

48 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured. Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,
TROY, N. Y.



SELF LUBRICATING

Rotary Screw Ventilators

WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,
Manufacturers,
46 Cortlandt St., New York
☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,
VEDDER PATTERN WORKS,
TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,
215 North 2d St., - - - Philadelphia.
FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction
Cor. Randolph and Atwater Sts.,
Detroit, Mich.

CENTRAL PATTERN WORKS,

Stove and Furnace Patterns a specialty. Work first-class under a full guarantee.

E. C. HALTEMAN,
Proprietor, Dayton, O



$25 to $50 per week, to Agents, Ladies or Gentlemen, using or selling "Old Reliable Plater." Only practical way to replate rusty and worn knives, forks, spoons, etc; quickly done by dipping in melted metal. No experience, polishing or machinery. Thick plate at one operation; lasts 5 to 10 years; fine finish when taken from the plater. Every family has plating to do. Plater sells readily. Profits large. W. P. Harrison & Co., Columbus, O.

FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers' original patterns.

STOVE REPAIRS.

MICA.

219 Locust St., St. Louis.

A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH

WHEN HE SAYS THAT THE

RUTLAND LINING

FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.



"FIRESTONE"

Has proved I self to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,
TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

When In Need of

FINE STOVE PLATE FACINGS,

Write to the **originators** and **headquarters** for prices and trial samples.

THE S. OBERMAYER CO., - - - - **Cincinnati, O., and Chicago, Ill.**

MANUFACTURERS OF

Foundry Facings, Supplies and Equipments. Importers and Refiners all grades Plumbago.

Catalogue and special circulars sent on application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N. Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

THE CONNECTICUT PLATING CO.,

No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work. Estimates cheerfully submitted.

CLAD'S

Iron Enameled Ice Cream Cans.



Do not buy Cans until you get our prices. We are Headquarters.

CLAD'S

Ice Cream Dishers and Measures.



Millions in use. Seamless cups, will not rust German Silver knives; and not tin knives Cream will not stick to sides. Sizes standard.



WRITE FOR PRICES.

V. CLAD & SONS,

MANUFACTURERS,

117-119 So. Eleventh St., Philadelphia.

THE KELLY

Self-Acting Frost-Proof, After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

—SEND FOR CATALOGUE.—

Thomas Kelly & Bro.,

124 Franklin St., Chicago,

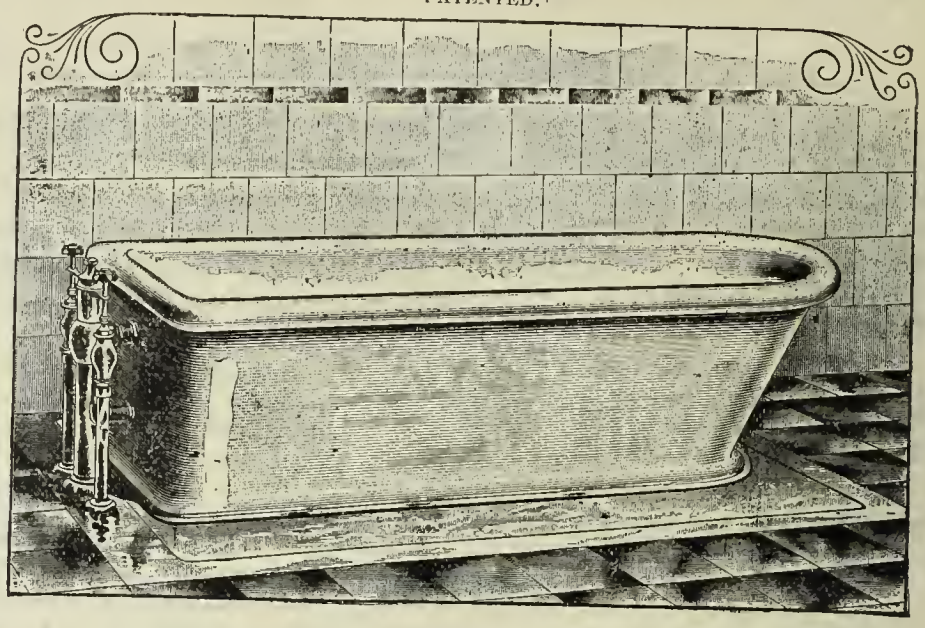
Manufacturers of Permanent Plumbing Goods.

DO YOU WANT A PERFECT BATH TUB?

THEN USE

"THE PURITAN ROLLED RIM."

PATENTED.



Since the introduction of Iron Bath Tubs there have been objections made to their height, they being very inconvenient to get in or out of; also, difficult to clean beneath them. We have overcome both these objections in the "Puritan" Bath.

In the first place, while retaining the full size inside, it is 8½ inches less in height from the floor to the top of the rim, thus making it very much easier of access.

In the second place, by using the floor flange we dispense with the objectionable feet and floor space underneath, and also give the bath a better means of support than can be obtained by feet, and presenting as it does a plain, smooth surface both inside and out, it can easily be kept clean, and when in position it has a neater and more substantial appearance than a bath on feet.

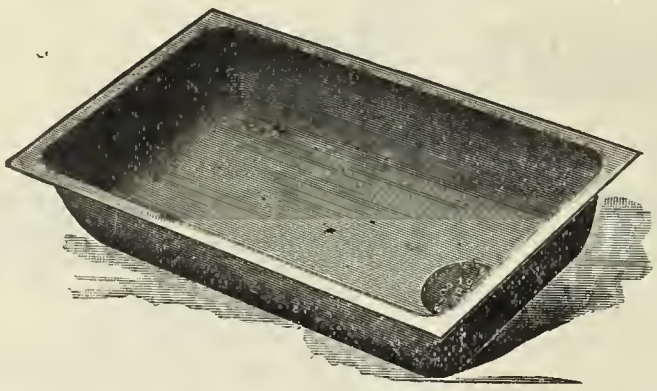
THE BATH SETS INTO THE FLOOR ABOUT 2½ INCHES. We have these Baths fitted with a variety of Fixtures. Send for circulars.

DALTON-INGERSOLL COMPANY,

169 to 175 High Street (Fort Hill Square), **Boston, Mass.**

CHICAGO BRANCH: 65 Washington St., Institute of Building Arts.

NEW YORK AGENCY: C. Hoffman, Jr., 277 Pearl St

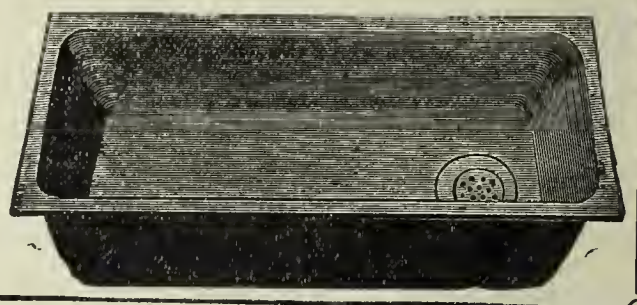


PLUMBERS

EVERYWHERE

ARE ADOPTING THE

COLUMBUS NEW ERA WROUGHT STEEL



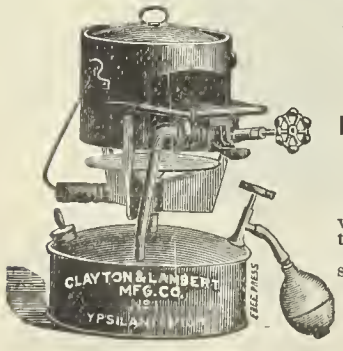
Sinks because they are superior in many ways to the old cast sinks. They are not porous, hence non-absorbent, and are in consequence free from smell and filthiness, etc.; light, cheap and made in all sizes and finishes. Write for price.

THE

Kilbourne and Jacobs Man'fg Co.

Columbus, Ohio, U. S. A.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

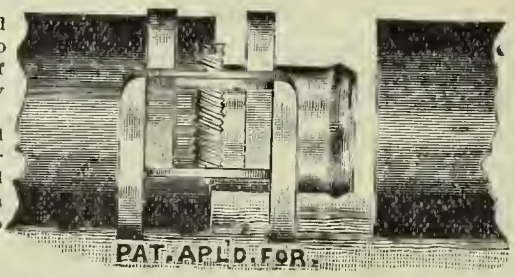
They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.

Sold by Jobbers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

One Band and Tube do the work of two of any other make a knife and screw driver being all the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust Sold by Jobbers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.

PECK BROS. & CO.,

Fine Sanitary Goods.

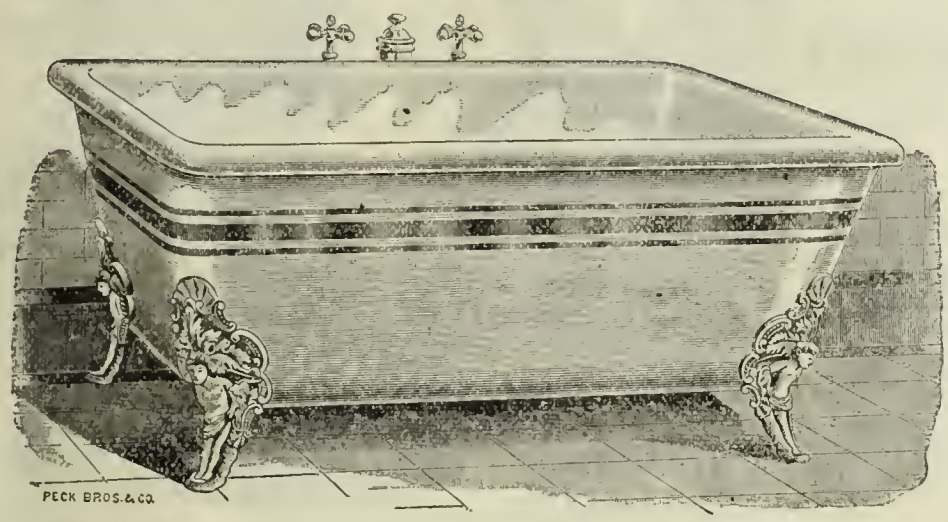


Fig. 198, Catalogue of 1893.

47 Cliff St, NEW YORK. 259 Wabash Ave., CHICAGO. 127 Chestnut St., NEW HAVEN, CT. 65 Oliver St., BOSTON.

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

INEXPENSIVE.

It is so lined that it will not crack, nor split; neither can it rust.

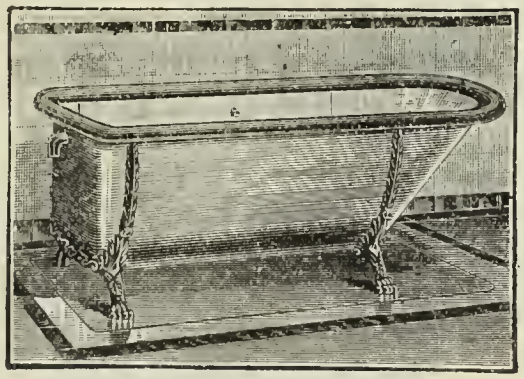
No trouble at all to keep it clean, for it cannot harbor dirt nor vermin. It is an open sanitary fixture, no wood but the rim; unbreakable, light, artistic, low priced.

Don't buy an imitation—get the **Steel Clad.** All plumbers and jobbers have it, or the

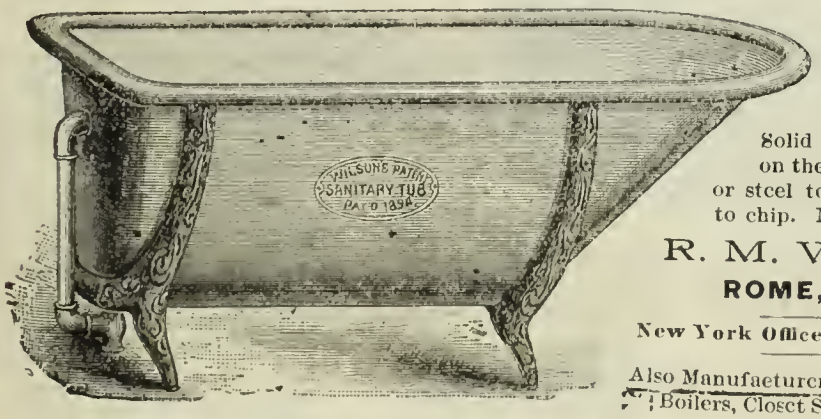
STEEL CLAD BATH CO. OF NEW YORK,
447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,
Detroit, Mich.
GEORGE BOOTH, President.

Better than the high priced ones, for a low price. Many styles and sizes, only one quality—the best.



R. M. Wilson's Solid Copper Bath Tub.



WRITE FOR CATALOGUE.

Success assured to all who handle the Wilson Patent Sanitary Bath Tub. The only Solid Copper Bath Tub on the market. No iron or steel to rust. No enamel to chip. Manufactured by

R. M. WILSON,
ROME, N. Y.

New York Office, 92 Walker St.

Also Manufacturer of Copper Range Boilers, Closet Seats and Tanks and Brass Work.

WELL!! WELL!! WELL!!



PORCELAIN LINED BATHTUBS, WITH Overflow Strainers and Plugs Complete

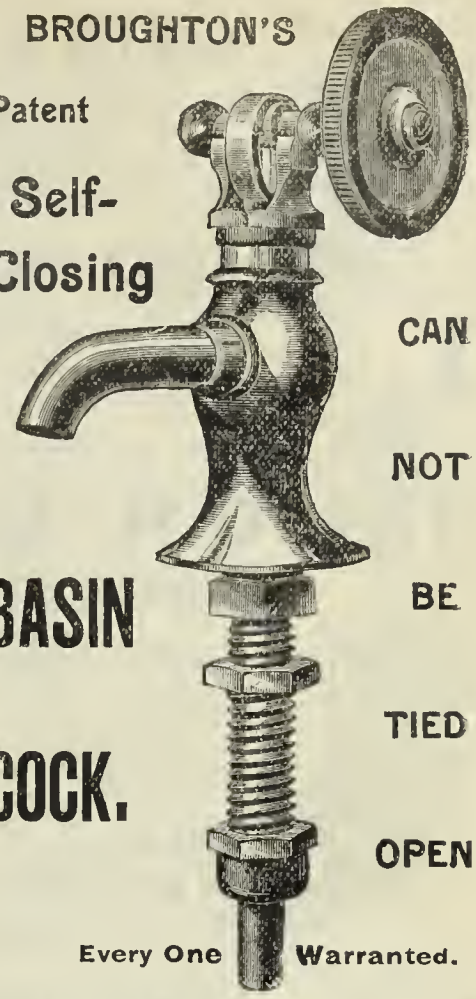
$28.00

WRITE US.

The Stuart & Peterson Co.,
Burlington, N.J., U.S.A.

Porcelain Lining to order.
Special Goods to Order

BROUGHTON'S Patent Self-Closing

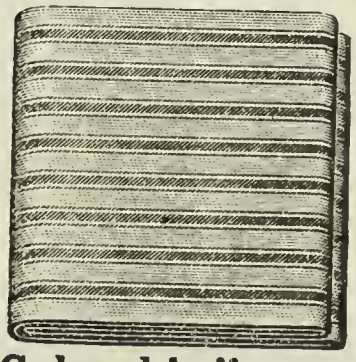


CAN NOT BE TIED OPEN.

BASIN COCK.

Every One Warranted.

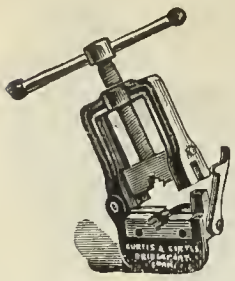
Stebbins Mfg. Co., BRIGHTWOOD, MASS.,
SOLE MANUFACTURERS.



"Columbia" Wiping Cloths FREE!

Not free exactly from a financial standpoint (altho' very near it), but free from all defects due to **a Poor Quality of Ticking, Carelessness in Making and a Bungling Manner of Fastening the Ends.** A cloth free from the above defects is well worth the price we ask, 12 cents each, or six for 70 cents. Remember we make any kind—send us the size you want, giving the wiping edge first.

THE J. W. CHAMBERLAIN CO.,
Plumbing & Steam Fitting Specialties,
BANGOR, MAINE.



The Curtis Pipe Vise.



The Reversible Ratchet Drill.

CURTIS & CURTIS,

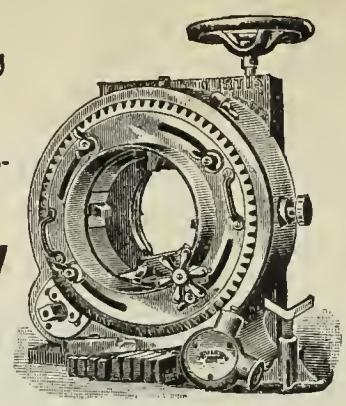
56 Garden St., Bridgeport, Conn.

We make a specialty of manufacturing all kinds of

TOOLS or MACHINERY

Used in Working Wrought Iron Pipe.

Send for new 52-page Illustrated Catalogue.

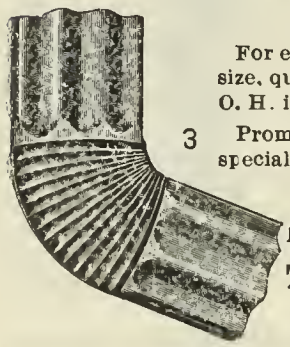


The Forbes Patent Die Stock.

The "O.H." One Piece PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

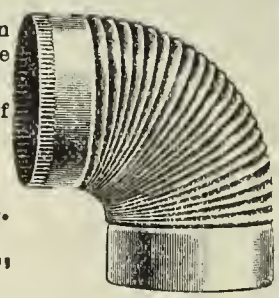
(PATENTED OCT. 25, 1892.)



For extreme durability and strength, precision in size, quality of material and handsome design, the O. H. is unequaled.

Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.



For Sale by all First-class Jobbers.

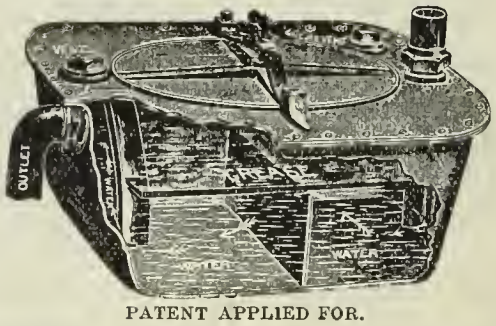
THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.

THE EXCELSIOR

GREASE AND SEWER-GAS TRAP.

This Trap is designed to be placed under a sink. Being perfectly air tight no sewer gas or odor can escape. They have been thoroughly tested in numerous private dwellings, also in State and National buildings, where they are giving the best satisfaction. Write for circulars and prices.



PATENT APPLIED FOR.

MANUFACTURED BY

Sproul & McGurrin,

186 E. Fulton St., GRAND RAPIDS, MICH.

SLATE

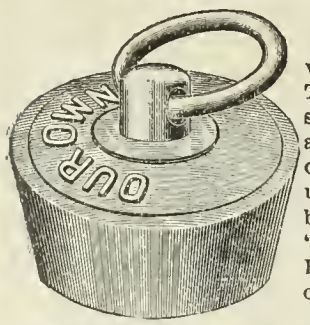
FOR ROOFING AND BLACKBOARDS.

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS.

AULD & CONGER,

100 EUCLID AVE., CLEVELAND, OHIO.

BASIN AND BATH TUB PLUG.



White Rubber with Heavy Nickel Trimmings. Absolutely the neatest and strongest plug on the market. Put up one dozen in a box, and labeled "OUR OWN" BASIN PLUG only.

H. O. CANFIELD,

MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.

Leather and Rubber WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

Ruggles St., Boston, Mass.

PROUDMAN BROS.'

Improved Hangers

FOR

Eaves Trough

ARE THE BEST.

MERIDEN,

CONN.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 39th Street, NEW YORK.

LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order.

Helper Fire Pot

FOR PLUMBERS' AND TINNERS' USE.

A Combination of Fire Pot and Torch.



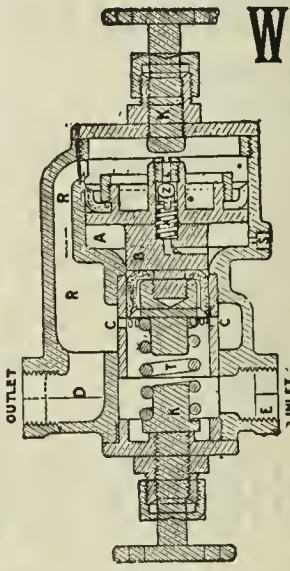
The only pot where the burner is on a swivel and patented.

The only fire pot with 16 gauge brass tank. All our goods guaranteed.

SEND FOR CATALOGUE.

UNION HEATER SUPPLY CO.,

88 Congress St., East, Detroit, Mich.



W. G. Taafel's Pressure Regulator.

Send for Price-List.

NEWARK REGULATOR COMPANY

Newark, Ohio.



OUR ADJUSTABLE STOCKS and DIES are universally acknowledged to be the BEST! We also make all our Tools on the same principle, of the Best Material and Workmanship, and always with a view of *time and labor saving in their use.*

— He Got There at Last.—The foxy boy applied for a job.

"Do you want a boy?" he asked of the magnate of the office, standing before him cap in hand.

"Nobody wants a boy," replied the magnate, eyeing him sharply.

"Do you need a boy?" asked the applicant, nowise abashed.

"Nobody needs a boy," came the discouraging reply.

The boy stuck his cap on the back of his head.

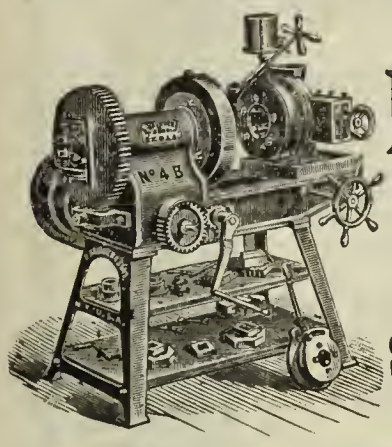
"Well, say, mister," he inquired, "do you have to have a boy?"

The magnate collapsed.

"I'm sorry to say we do," he said, "and I guess you're about what we want."
—*Detroit Free Press.*

D. SAUNDERS' SONS,

MANUFACTURERS OF



PIPE Cutting AND Threading MACHINES

All sizes ¼ inch to 16 inch for Pipe Mill, Gas and Steam Fitters' use. Tapping Machines for steam-fittings, also

STEAM and GAS FITTERS' HAND TOOLS.

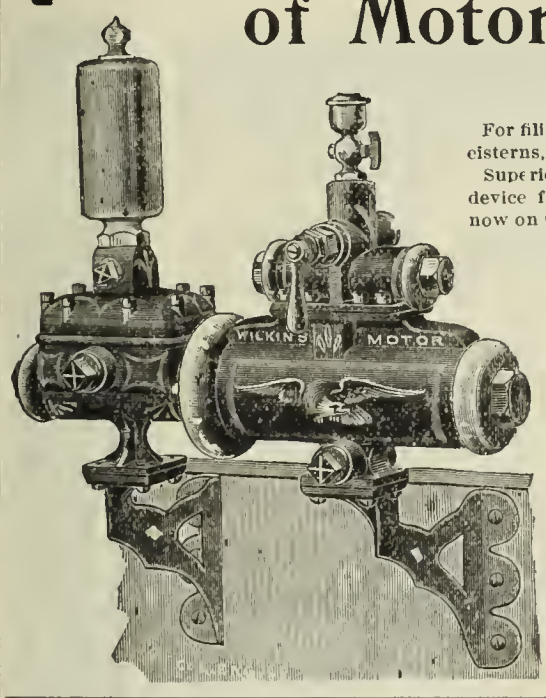
SEND FOR CATALOGUE.

No. 4 B Machine, ⅛ to 4 inch. Hand or Power.

No. 25 Atherton St., Yonkers, N. Y.

THE "WILKINS" IS KING

of Motor Pumps.



For filling tanks from cisterns, etc.

Superior to any other device for the purpose now on the market.

It is compact, simple, cheap and durable. Nothing to get out of order or leak. No drip pan is necessary to catch grease. Every pump guaranteed.

We manufacture a full line of High Grade Sanitary Specialties and invite correspondence.

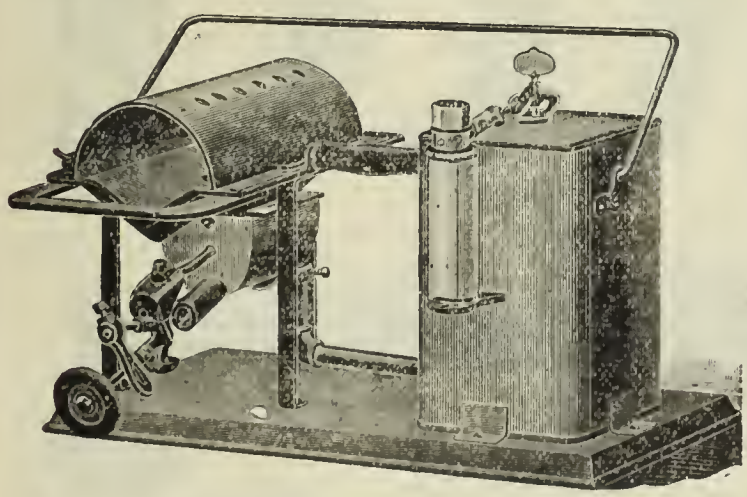
THE

Columbus Brass Co.,

COLUMBUS, - - OHIO.

Hull's No. 3 Bonanza Furnace.

FOR TINNERS ONLY.



Price, Heavy Tin Tank, $6.00.
Price, Copper Tank, $7.00.
Price, Tin Tank and Bulb Pump, $5.50.

Very convenient for Bench use. Hinged arch top. Tin or copper tank. My new Bonanza double burner strikes the coppers on both sides. Hottest fire ever produced from gasoline. Will heat largest coppers fast enough to use. My Rubber Air Pump, Handle or Bulb Pump, as may be desired. The strongest wind can't blow it out. One dollar off cash with order. Write for circulars.

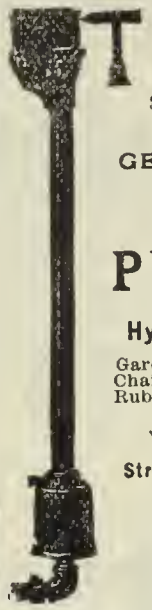
M L. HULL,
Cleveland, - Ohio.

When Painting Roofs,
When Painting Stacks or Boiler Fronts,

use Dixon's Silica-Graphite Paint and you will never regret it. Roofs well painted have not required repainting in 10 to 15 years. Graphite paint is equally useful for wood or metal. Send for circulars.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

W. & B. DOUGLAS,



Middletown, Conn.

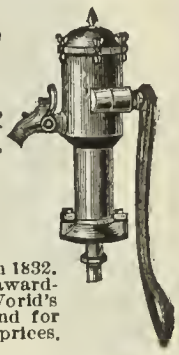
Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON,
156 N. Fifth St., Philadelphia.

Manufacturers of

PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS' REVERSIBLE STEEL AND WOOD TRACK HAY CARRIERS



TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS

GREATEST IMPROVEMENT OF THE AGE.

Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.

—RAPID—
Pipe Tapping Machine.



Latest and Best

Lightest and Strongest.

A simple, effective and strongly built machine, by means of which any workman of ordinary intelligence can rapidly make service connection to any water or gas main without turning off the pressure or interfering with the consumer's supply of water or gas.

Price complete for ½, ¾, ¾ and 1 in. connections, $100.00.

Liberal Discount to the Trade.

BAILEY-FARRELL MFG. CO.,

PITTSBURG, PA.

— "What warrant have you for thinking that Shakespeare was a broker?"

"Oh, none, only the fact that he has furnished so many stock quotations."—*Indianapolis Journal.*



POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.





THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.

It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.



COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

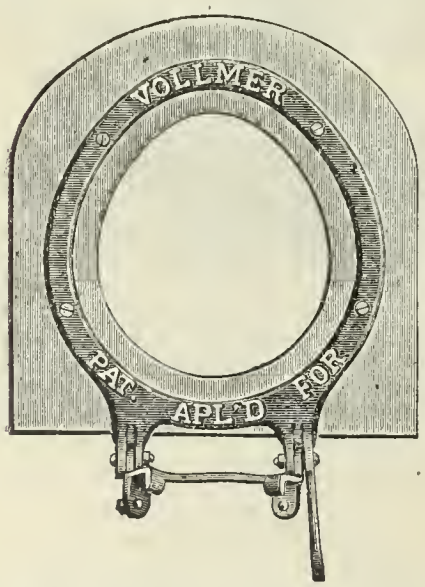
Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

6-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co. New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St Joseph Mo.

Vollmer Closet Seat.



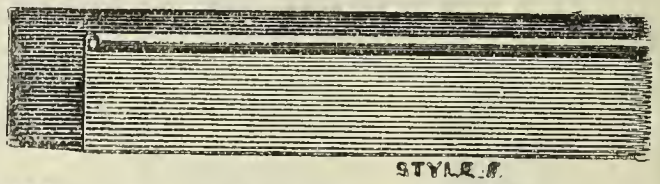
Can be attached to any Philadelphia Hopper by adjusting 2 set screws.

SEND FOR CATALOGUE.

ZERO VALVE CO.,

304 Seneca Street, - BUFFALO, N. Y.





STYLE B.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

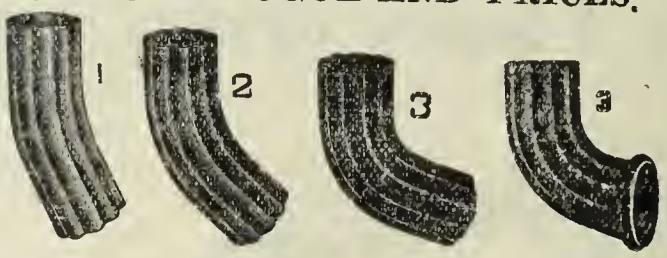
—MANUFACTURE—

PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

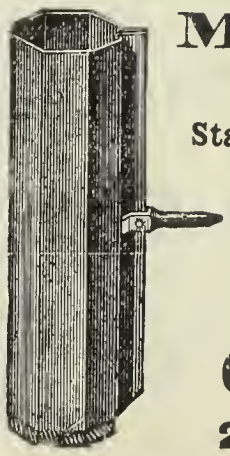
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,



(INCORPORATED,)
Manufacturers of the
Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.



BOWERS ROOFING AND METAL WORKS.

Eaves-Troughs, Gutters, Miters, Trough-Ends, Conductors, Ridging. **BINGHAMTON, N. Y.**

If you want the best

Eave Trough,

Conductor Pipe, etc.,

Write us at once and get our prices. We can save you money, as well as furnish you with superior goods manufactured on new and greatly improved machinery—Address

The Kanneberg Roofing Co.,

Canton Ohio

DRAWN STEEL SINKS

Anchor and Diamond



Brand

—MANUFACTURED BY—

L. Wolff Manufacturing Company,

GENERAL OFFICES, 93 W. Lake Street, Chicago.

Write for Illustrated Price-List Just Published.

THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR.

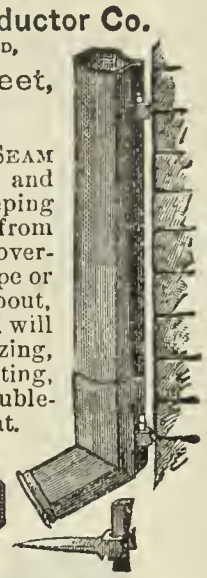
MANUFACTURED BY THE

S. S. S. Conductor Co.

LIMITED,

163 Lacock Street,

ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.

CLIMAX AUTOMATIC CELLAR DRAINER.

A Cheap, Reliable Remedy.

Never Failing.



It lifts water from Cellars, Wheel Pits, etc. and carries it into the street or sewer.

Requires no attention.

The Climax Gas Machine and Mixer stands at the head; makes brilliant, smokeless, steady and very cheap gas for stores, churches, etc.

WRITE FOR PAMPHLET.

C. M. KEMP MFG. CO.,

Baltimore, Md.

READY!

After months of labor, accompanied by great expense, we have just received from the press

OUR 1895 CATALOGUE,

which we are proud to say is the *largest catalogue* in our legitimate line *ever published.** It contains many novelties never before shown, and is a complete and up-to-date directory of supplies in our field. We are not sending it out in a "helter-skelter" fashion—it does not pay—but every **Tinner, Tinware Manufacturer, Roofer, Plumber** and **Architect** who will take the trouble to send us a postal request will receive a copy.

* Contains 128 pages, full of illustrations and designs.

BERGER BROS., Manf'rs of Tinners' Hardware and Roofers' Supplies. 231 & 237 Arch St., **PHILADELPHIA.**

BLACK DIAMOND EXTRA TRADE MARK COATED ROOFING PLATES

are thoroughly AMERICAN

In every respect. One trial will convince you of their superiority over anything you have ever used Send for sample and thoroughly test it. Manufactured by HENRY W. SCATTERGOOD.

Black Diamond Tin Plate Works, 51 & 53 Laurel St., Phila.

TINNERS, ATTENTION! GREAT REDUCTION IN PRICE.



Best Eave Trough Fastener in the World.

Yapp Patent Champion Fastener

MANUFACTURED BY

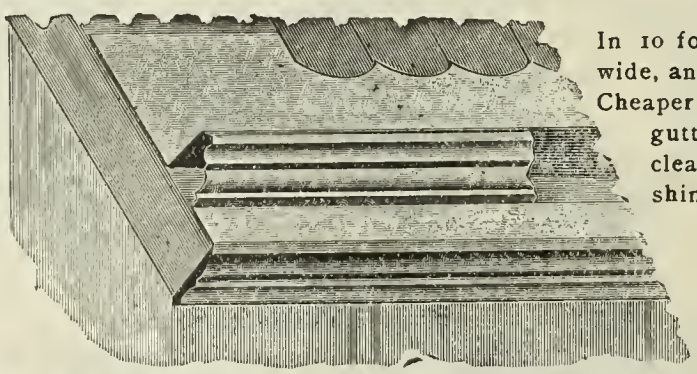
WALTHER & CHRISTMAN,

Successors to CHAS. BODY,

269 to 275 Central Ave., Cleveland, Ohio

Send for sample and price-list

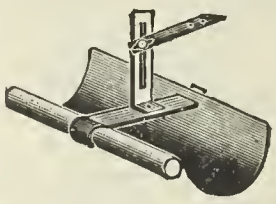
Sims' Ornamental Roof Gutter.



In 10 foot lengths, 12 in. to 30 in. wide, any fall desired, will not leak. Cheaper than wood or any other gutter. One continuous piece, clear up under slate or tin or shingle. Write for prices.

The **Sims Mfg. Co.,** Newark, O.

RICHMOND

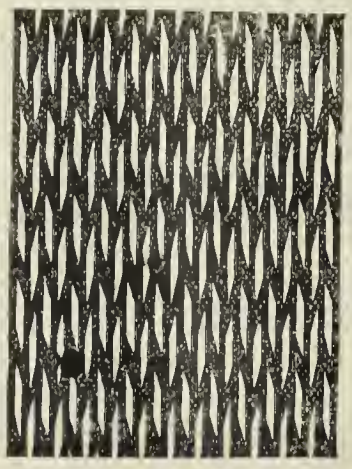


E. T. HANGER PATENTED.

TINNER, ATTENTION!

The cross-bar is hooked firmly to both sides of the trough. The slotted upright, with thumb-screw, permits instant adjustment to the requisite fall. It is never necessary to bend the suspending rod to suit pitch of roof. No obstructions to catch leaves and dirt, as in other adjustable hangers. **Save Time and Money.** Sample order freight allowed. For sale by first-class Jobbers. Manufactured by

JOHN SEVERDING, - - Richmond, Ind.



SHEET METAL LATH.

Improved METALLIC LATHING is now being used in construction of all modern buildings, being FIRE-PROOF, RIGID, with ample keying qualities, and is easily applied, and embraces a material saving in plaster if necessary.

Plain, Painted or Galvanized Corrugated Sheets.

SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted and Corrugated Leader, cheapest and best in the market. Sheet iron piping, Stove Pipe and Fittings of every description.

General Galvanizing to Order.

The Jersey City Galvanizing Co., Manufacturers and Jobbers In

Galvanized Material of Every Description.

Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE OF OUR SPECIALTIES.

CHAMPION of the WORLD.

(No reference to Mr. Corbett.)

In our "PENNSYL" OLD METHOD Terne Plate we have the Champion of all Champions *Roofing Plate*, a fact which is fully borne out by **Architects, Roofers and Builders.**

When we first introduced the "Pennsyl" it was with the intention that it should *always* be the Best and Leading Brand of Roofing Tin made, and it certainly is.

Just to think, every box contains *45 lbs.* of Pure coating. Other brands that are put in competition only have 30 to 36 lbs.

Every sheet guaranteed perfect in every way.

Every sheet stamped and squared.

We put it on the market in 1879 and we have been selling it continually since.

GUMMEY, SPERING & CO.,

Manufacturers and Importers Tin Plate, Metals, &c.

PHILADELPHIA, U. S. A.

Beware of a Brand on the market *simply called* "Old Method," it is a poor imitation, and intended only *to deceive.*

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. **BRIDGEPORT, OHIO.**

REMEMBER—At the same address, with larger stock than ever.

MERRY'S OLD METHOD Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,

535 to 547 West 15th Street, New York.

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

FOLLANSBEE BROTHERS COMPANY,

Successors to

James B. Scott & Co.,

TIN PLATE,
SOLDER,
ZINC,

SHEET IRON ROOFING IRON

All Descriptions of

TOOLS,
MACHINES
FOR TINNERS.

122 and 124 Second Ave., Pittsburgh, Pa.

"REMOVAL."

We will remove about April 1st to the five story building

245 & 247 Water Street.

Increased floor space, larger stocks and better facilities will enable us to make

PROMPT DELIVERIES.

MERCHANT & CO., Inc., = = New York City.

NEW CASTLE

New Castle Steel and Tin Plate Co., New Castle, Pa.

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

THE CAMBRIDGE IRON & STEEL CO.

MANUFACTURERS OF

GALVANIZED SHEET IRON

CAMBRIDGE C I & S CO BEST TRADE MARK

BLACK SHEETS FOR ROOFING & CORRUGATING

PICKLED & COLD ROLLED FOR STAMPING

CAPACITY. RANGES FROM No. 30 26 INCHES WIDE TO 1/4 × 40×120

CORRESPONDENCE SOLICITED

OFFICE & WORKS CAMBRIDGE, OHIO.

ILLINOIS ZINC COMPANY,

MANUFACTURERS OF

SPELTER AND SHEET ZINC

PERU, ILLINOIS.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

PALM OIL

BRANDS:

"Cecelia" Clarified Palm,
"Lagos" Palm,
"Choice Red" Palm,
"Brown" Palm.

☞ "Cecelia" Clarified Palm Oil is prepared by us especially for **Tin Plate Manufacturers**, and is clarified in order to remove moisture grit, and free acid to the minimum, thus making it the safest and surest oil to use.

LAMBERT. STOUGHTON & COOPER,

IMPORTERS AND PRESSERS OF OIL,

117 Walnut St, PHILADELPHIA, PA

Pontymister Old Style Ternes.

Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS.** per box 28 x 20.

To Be Had of All Dealers.

GLOBE SOLDERING FURNACE.

The Tinners' and Plumbers' Wonder.

Saves half the fuel, melts quicker, and is easier operated than any other.



Works indoors and out equally well.

Write for Prices.

COUCH BROS. MFG. CO., DAYTON, O.

P. B. CALVERT & CO.,

IMPORTERS OF

TIN PLATES AND METALS

Philadelphia, Pa.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. **Brooklyn, N. Y.**

JOSEPH C. KENT, President. **GEORGE DANBY, Sec'y and Treas.**

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.

THE PHILLIPS TIN PLATE CO., Philadelphia, Pa.

"F. R. P. EXTRA." Treble coated. Oil Finish. Guaranteed to carry 45 lb. coating.
"PHILLIPS ROOFING." Extra heavy. Bright finish. " " 35 lb. "
"BOSTON." Heavy Spangled Terne. Guaranteed to carry 20 lb. coating.
"NATIONAL." (Worcester grade.) " " 10 lb. "

TIN PLATE

FIVE GRADES OF **BRIGHT.**

TWO GRADES OF **BOILER SIZES.**

FURNACE PIPE SIZES. COKES IN MANY ODD SIZES.

GOLDEN STAR REDIPPED TISSUE PACKED.

J. M. & L. A. OSBORN, - CLEVELAND, O.

ROOFING PLATES, All Grades.

BRIGHT CHARCOAL TIN PLATES,

COKE TIN PLATES,

American and Foreign.

A large assortment of weights, sizes and qualities.

B B Galvanized Sheets.

Charcoal Cleaned Sheet Iron, Cold Rolled and Common Sheet Iron, Galvanized and Terne Eave Trough and Gutter, Corrugated Leader, Elbows and Shoes.

SOLDER.

Sheet Zinc, Sheet Copper, Wire, Etc.

Tin, Lead, Spelter, Ingot Copper, Antimony, Hard Metal.

BRUCE & COOK,

186, 188, 190 Water St., 248, 250 Pearl St., New York.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. Harvey's Patent Cleaned Black Iron

Painted Corrugated Roofing and Siding.

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

Galvanized Gutter.

Galvanized Down Spout.

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weather-board and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96 102 Reade St., New York.

— JUDGE: "I understand the plaintiff is suing for a horse?"

Attorney: "Yes, your honor, but there seems to be a hitch about the evidence."

Judge: "Well, you can't saddle the responsibility on the court. Let the case proceed."—*Atlanta Journal.*

— WITHIN STRIKING DISTANCE.—Band Leader (to trombone): "Mr. Johnsing, yo's two bars behin' de res'."

Mr. Johnsing (testily): "Yo' needn' bodder 'bout me; I kin ketch up any time I wanter."—*Exchange.*

AMERICAN BRAND

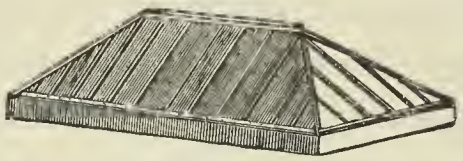
Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.

AMERICAN ROOFING CO.,
ST. LOUIS and CINCINNATI.

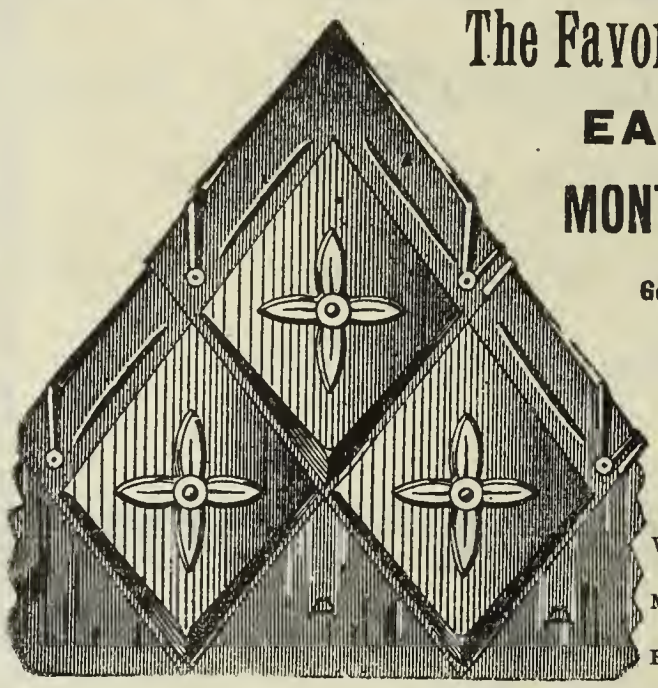
Mention this paper.



JAMES A. MILLER & BRO
129 and 131 So. Clinton St.,
CHICAGO.
MANUFACTURERS OF
Sheet Metal Skylights



The amount of skylight work we did for the World's Fair (over 600,000 sq. ft.) required us to so increase our facilities for such work that we have cheapened the cost materially, and we will be particularly pleased to quote prices for large or small skylight work "knocked down" or put together, as preferred.



The Favorite Metal Shingle
EASTLAKE.
MONTROSS PATENT.

Gothic and Diamond Tile.

Unequaled for beauty and excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit Mich.
MONTROSS METAL SHINGLE CO., Camden, N. J.
E. VAN NOORDEN & CO., Boston, Mass.



JOHN SANBORN,
Dealer in Metals,
and manufacturer of Refined Metal Solder, Wire Solder, Piano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 WATER STREET,
Near Beekman Street, NEW YORK.



GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.

ST. LOUIS CORRUGATING CO.,
MANUFACTURERS OF
SHEET METAL ROOFING, SIDING AND CEILING
OF ALL DESCRIPTIONS FROM
SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.
Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.
Factory 113 to 133 Soulard Street, ST. LOUIS, MO.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS
FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size, CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices.
LITTLEFORD BROS., SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati O

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



HARRY IRON AND STEEL ROOFING CO.,

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

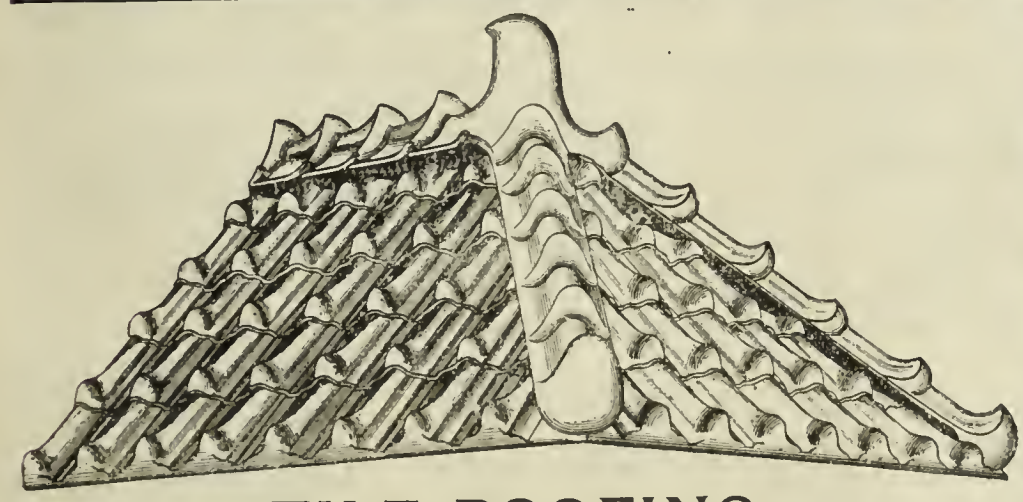
Designed for the better class of buildings, such as Residences, Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1895.

Mention THE METAL WORKER.





TILE ROOFING.

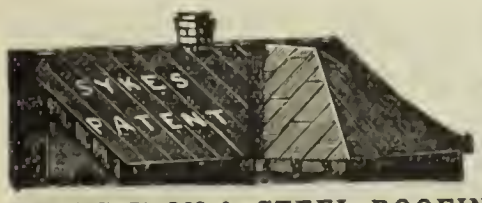
Made of COPPER, GALVANIZED IRON and BLACK STEEL.

The most artistic and durable roof on the market; guaranteed storm proof; made in large sheets, very easily and quickly applied. The accompanying cut shows the "American." Catalogue showing many designs on application. Write for prices.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

Eastern Office, 108 Chambers St., New York City.



WORLD'S FAIR AWARD.

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

MANUFACTURERS

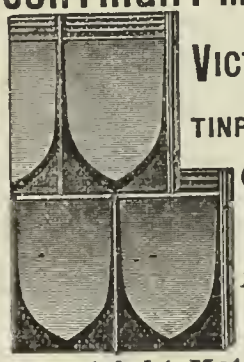


FOR

ROOFING AND SIDING.

Send for Circular and Prices.

CORTRIGHT METAL SLATES and VICTORIA SHINGLES



Made of TINPLATE, (Full Weight Only)

Galvanized Steel and COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office, 134 Van Buren Street, Chicago.



STEEL CEILINGS, ROOFINGS, SIDINGS,

Corrugated Iron, Tin and Terne Plates, Eaves Troughs, Conductor Pipes, Rain Water Cutoffs, Galvanized and Black Sheets.

Ceiling catalogue No. 170. Roofing catalogue No. D 169.

WHEELING CORRUGATING CO.,

Office and Works, Wheeling, W. Va.
Office and Warehouse, No. 474 Laflin Street, Chicago.
Office and Warehouse, No. 81 Fulton Street, New York.
Office and Warehouse, cor. 12th & Poplar Sts., St. Louis.

Special Discounts To The Trade.



The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade.

TIN AND IRON SHOW CARDS.

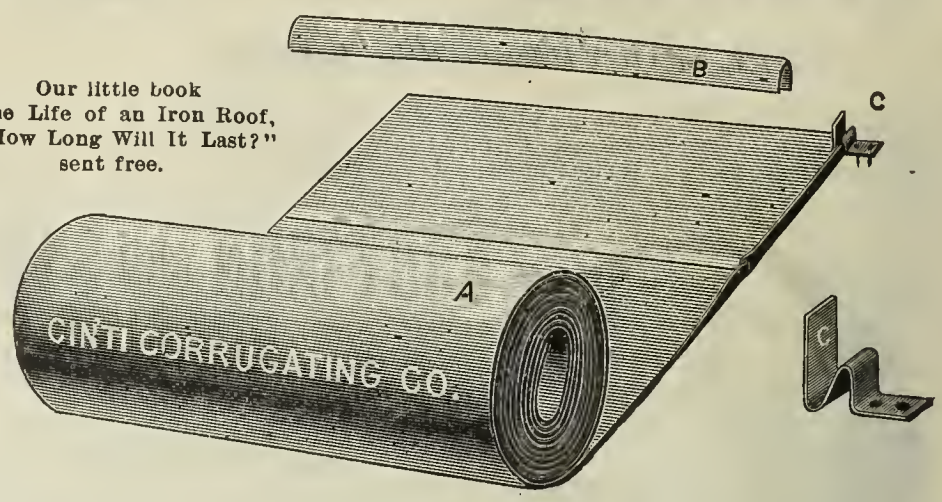
110 John St., - New York.

ROLL AND CAP STEEL ROOFING.

The Cincinnati Corrugating Co.,
Box 314, Piqua, O.

IS made from the best soft steel formed into plain rolls 26 in. wide by 50 fee long. It is especially adapted for roofs having a pitch or fall of one or two inches per foot and very long rafters. We furnish tools for applying this roofing.

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.



The New York Iron Roofing and Corrugating Co.
Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S.
FIRST & WASHINGTON STS. JERSEY CITY, N.J.



Fine Metal Ceilings.

J. H. ELLER & CO.,

MANUFACTURERS OF

STEEL ROOFING,

Corrugated Iron Roofing and Siding,

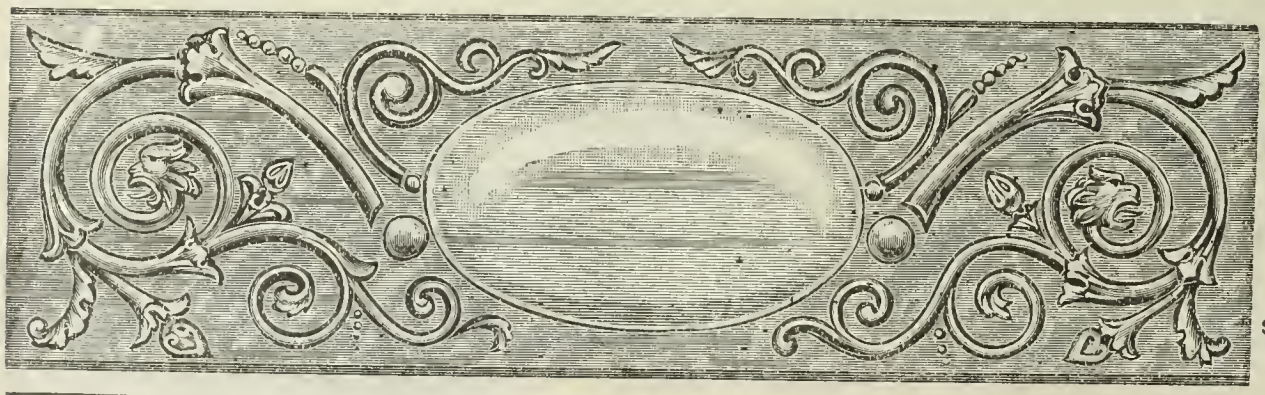
Pressed Steel Brick and Rock Face Siding.

GALVANIZED CORNICE, WINDOW CAPS, CRESTINGS, FINIALS, ETC.

GALVANIZED STEEL EAVE TROUGH, CORRUGATED EXPANDING CONDUCTOR, EAVE TROUGH HANGERS, ETC.

Estimates Furnished for Special Designs on Short Notice.
WRITE FOR CATALOGUE AND PRICES.
Office 194 E. Fifth Street, - - - - - **Canton, Ohio.**

FRIEDLEY & VOSHARDT, 194 & 196 Mather Street, **CHICAGO, ILL.**



MANUFACTURERS OF
Sheet Metal, Zinc and Copper Ornaments
FOR
Interior and Exterior Work, Steel Ceilings, Statuary, &c.
Send for Catalogue and Prices.

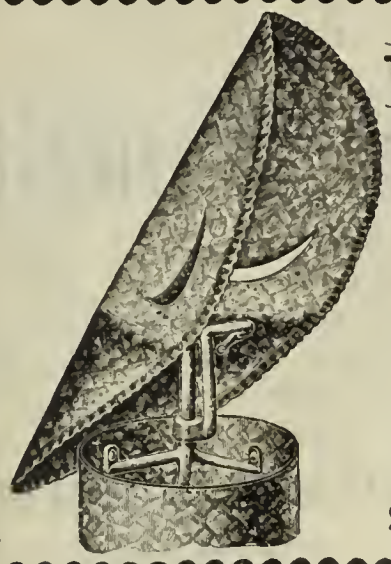
Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.

— LADY (widow): "Do you know that my daughter has set her eyes upon you, Herr Miller?"

Gent (flattered): "Has she really?"

Lady: "Certainly; only to-day she was saying, 'That's the sort of gentleman I should like for my papa.'"—*Tagliche Rundschau.*

THE PHILADELPHIA STEEL ROOFING CO.
MANUFACTURERS OF
STEEL ROOFING AND CORRUGATED IRON,
514, 516 & 518, BEACH ST.
PHILADELPHIA, PA.
SEND FOR CATALOGUE AND PRICES.



THE SUDWICK PATENT CHIMNEY TOP.

Does not choke with soot.

Adjusts with slightest pressure of air.

THE LATEST AND BEST CHIMNEY TOP MADE.

Write for prices and full information.

The Canton Steel Roofing Co.,

Sole Manufacturers, CANTON, OHIO.

PAINT. PAINT.

American Seal Ready Mixed Paint

IS THE BEST

For Painting Wood, Iron Tin, Stone, Brick, Plaster, or any Surface, Outside or Inside.

It will neither chalk, crack, peel nor blister. Made from pure linseed oil. Every package guaranteed. Write for color cards, prices, etc.

WILLIAM CONNORS, 677 & 679 River Street, Troy, N. Y.

Established in 1852.

Architectural Ornaments.



We have what many of our friends in the trade have been pleased to declare is the Handsomest Catalogue of SHEET METAL ORNAMENTS FOR CORNICE MAKERS' use ever issued.



A copy will be sent you on request, mentioning this advertisement.

JAMES WHITE,

446 to 456 Adelphi Street, Brooklyn, N. Y.

ROOFING

Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.

THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,

108 BUILDERS' EXCHANGE, KANSAS CITY, MO.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and bookseller, 96-102 Reade St., New York.

— A YOUNG HERO.—Tommy: "When I am a man I am going to be a soldier."

Mother: "What, and be killed by the enemy?"

Tommy: "Oh, well, then I guess I'll be the enemy."—*Yale Record.*

— MR. GOFF: "What side of the street do you live on?"

Witness: "On either side. If you go one way it is on the right side; if you go the other way it's on the left."—*Texas Siftings.*

— CONSIDERATE.—Tenant: "See here! That flat you rented to me is full of cockroaches."

Agent: "That's all right. We never claim anything left over by a former tenant."

ELBOW CHART

—FOR—

TIN and SHEET IRON WORKERS,

Giving the Rise of the Miter Line of Elbows of any Diameter and Number of Pieces and for any Angle.

This is an easy and practical system of producing elbow patterns for the use of all light or heavy sheet metal workers. It is simple, accurate and most valuable, being the only *thumb* rule ever produced from which accurate results may be expected. Every good workman has some rule by which he may develop a satisfactory pattern for Elbows at right angles, but when something different is wanted, it is a little trouble. By the use of this chart he can safely depend on getting a correct pattern for any elbow, no matter of what diameter, number of pieces or angle, and mark it out direct on his strip of iron or tin, almost as quick as if he had a pattern. This chart has more combinations and measurements than may be counted, and will be a great help to young or old at the business.

PRICE, 50c. BY MAIL.

DAVID WILLIAMS,

PUBLISHER and BOOKSELLER,

96-102 Reade Street, - New York.

THE ROOT & BARRON

ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer
PALMYRA, NEW YORK.

SALEM NAIL CO.

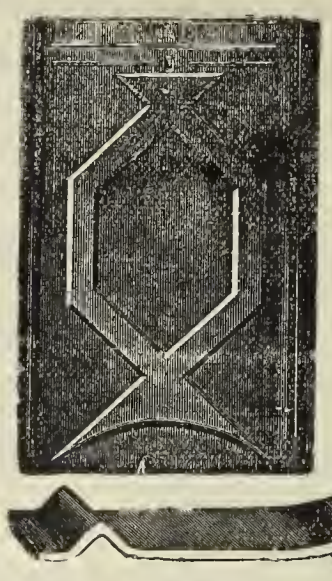
O. Nelson, 292 Pearl St., New York.

Manufacture every size and kind of Black, Tinned Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

Slaters' Tools, all Kinds



THE REAGAN Metallic Shingle

is absolutely waterproof, is easily applied, will last a lifetime, and is the par-excellence of Metallic Shingles. Send for Circular and Prices.

The Cincinnati Stamping Co.,
Cincinnati, Ohio.



"WILD CAT" Steel Roofing

Made to meet the demand for a cheap standing seam roof.
For description, illustrated price sheet write

The Decatur Steel Roofing Co.,

Manufacturers of
All Styles STEEL ROOFING,
STEEL SIDING,
CORRUGATED and BEADED CEILINGS,
EAVE TROUGH,
CONDUCTOR PIPE.
Prices Lower Than Ever.
OFFICE AND FACTORY:
DECATUR, ILL.

Mention *Metal Worker.*

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING & SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC.

QUARRIES, BANGOR, PA.
NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT.

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE Kitchen Sinks, Laundry Tubs, Washstand Tops, Marbleized Shelves, Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also **Mantels.**

FAIRHAVEN, VERMONT.

SEND FOR CATALOGUE.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, • • EASTON, PA.

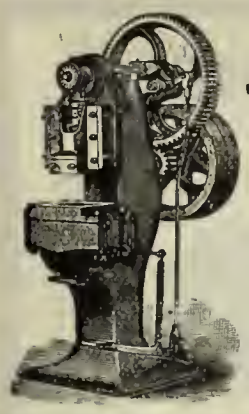
A practical means of rapidly reaching absolutely accurate results without the mental wear of computing.

It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, $3.00 ; Double Indexed Edition, $4.00.

Mailed, postpaid, upon receipt of price by DAVID WILLIAMS, 96-102 Reade Street, New York.

LADD'S DISCOUNT BOOK.

NIAGARA



Power Punching Press.

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

A FULL LINE.

THE BEST AND MOST IMPROVED

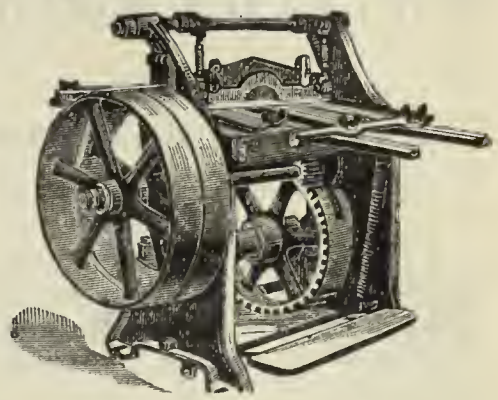
ROOFERS' TOOLS.

CAN MAKERS' TOOLS.

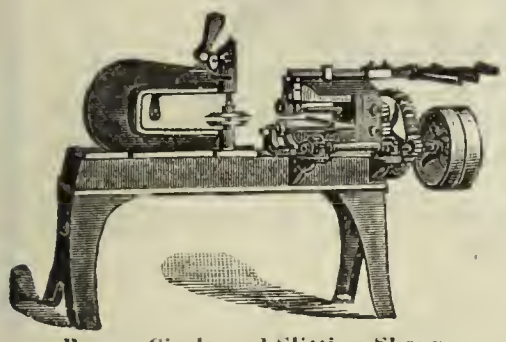
CORNICE MAKERS' TOOLS.

PRESSES AND DIES.

SQUARING, SLITTING and CIRCLE SHEARS.



Geared Power Squaring Shear.



Power Circle and Slitting Shear.

Complete Outfits for making Tinware, Cans and Other Sheet Metal Goods.

—MANUFACTURED BY—

THE NIAGARA STAMPING & TOOL CO.,

CORRESPONDENCE SOLICITED. **BUFFALO, N. Y.**

FERRACUTE

MACHINE CO.,

Bridgeton, N. J., U. S. A.,

Manufacturers of

FOOT AND POWER

PRESSES, DIES,

and other SHEET METAL TOOLS of all kinds.

Please send for Illustrated Price-Lists describing *300 kinds* of Presses, every kind of Dies, Tinners' Tools, Solder Apparatus, &c., for the manufacture of *Cans, Tinware, Sheet Iron Goods, Lamps, Gas Fixtures and other Brass Goods, Silver-ware, Hardware and other iron Goods of every kind.*



SIX SIZES OF NEW "STYLE C" INCLINABLE PRESSES, Heavy, Handsome, Durable and very Popular.

The Mere Money Getter.

There is not in the world a more ignoble character than the mere money getting American, insensible to every duty, regardless of every principle, bent only on amassing a fortune, and putting his fortune only to the basest uses—whether these uses be to speculate in stocks and wreck railroads himself, or to allow his son to lead a life of foolish and expensive idleness and gross debauchery, or to purchase some scoundrel of high social position, foreign or native, for his daughter. Such a man is only the more dangerous if he occasionally does some deed like founding a college or endowing a church, which makes these good people who are also foolish forget his real iniquity.

These men are equally careless of the workingmen, whom they oppress, and of the State, whose existence they imperil. There are not very many of them, but there is a very great number of men who approach more or less closely to the type, and just in so far as they do so approach, they are curses to the country. The man who is content to let politics go from bad to worse, jesting at the corruption of politicians, the man who is content to see the maladministration of justice without an immediate and resolute effort to reform it, is shirking his duty, and is preparing the way for infinite woe in the future.

Hard, brutal indifference to the right, and an equally brutal shortsightedness as to the inevitable results of corruption and injustice, are baleful beyond measure; and yet they are characteristic of a great many Americans who consider themselves perfectly respectable, and who are considered thriving, prosperous men by their easy going fellow citizens.—*Theodore Roosevelt in the Forum.*

— "Our engagement is quite a secret, you know."

"So everybody tells me."—*Pall Mall Budget.*

— Customer (timidly): "I—er—suppose you have some—er—suitable books for a man about to—er—be married?"

Head clerk (promptly): "Yes, sir; here, Skiggles, show this gentleman our line of largest sized pocketbooks."—*Buffalo Courier.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

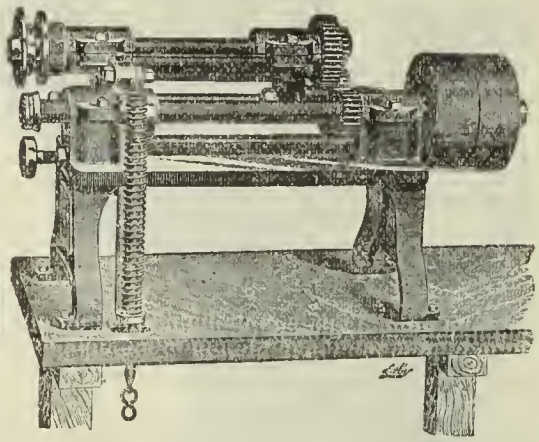
First, for Rapidity of Work.
Second, for Quality of Work.
Third, for Simplicity of Construction and Ease in Operating it.

To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor*, this machine is indispensable. Send for testimonials, &c., to

LYON, CONKLIN & CO.,

Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.



—OUR—

POWER TRIMMING MACHINE

is designed to trim the edges of **Sheet Metal Boxes, Rim Covers, Blacking Boxes, Lard Pail Covers, Ladle Bowls, Dipper Bowls and Similar Work. Will Trim Covers up to 1½ inches in depth and 15 in. diameter.**

—MANUFACTURED BY—

C. A. CROSBY & CO.,

176 & 178 S. Clinton St., Chicago, Ill., U.S.A.,

DESIGNERS AND BUILDERS OF

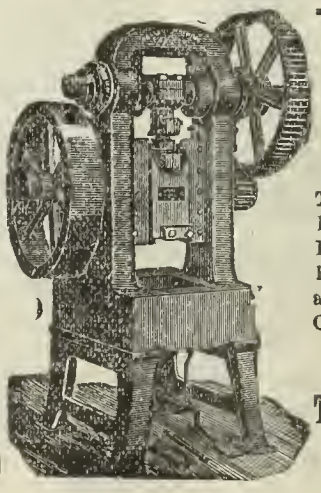
Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can and Soap Makers, and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Brass Goods and all Hardware Novelties.**

Special Attention to Dies of Every Description.

WORK GUARANTEED THE BEST.

Write for Prices and New Catalogue Containing Full Line of Tinners' Tools.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.



The Toledo Machine & Tool Co.,

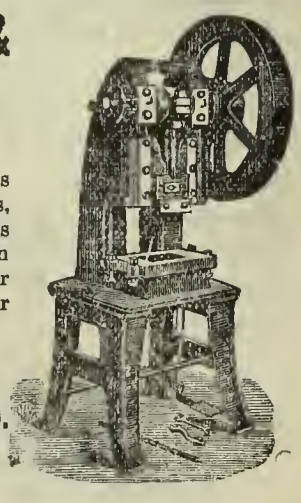
MANUFACTURERS OF

Power Punching Presses, Drop Presses Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

Send for Catalogue now being Printed.

The Toledo Machine & Tool Co.

Superior and Oak Sts., Toledo, O.



ALPHABETICAL LIST OF ADVERTISERS.

Acme Roofing & Supply Co.. 84
Ætna Standard Iron & Steel Co..... 79
American Boiler Co..... 21
American Radiator Co..... 1
American Roofing Co..... 84
American Sheet Iron Co..... 83
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 74
Auld & Conger..... 74
Aurora Vapor Stove Co..... 8
Bailey-Farrell Mfg. Co..... 75
Bangor Excelsior Slate Co.. 88
Barstow Stove Co..... 96
Bascom, H. Clay.. 70
Belden, F. E. Mica Mining Co..... 25
Bellaire Stamping Co..... 64
Berger Bros..... 78
Berger, L. D..... 84
Bibb, B. C. Stove Co..... 22
Black Diamond Tin Plate Works..... 78
Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 24
Bowen Mfg. Co..... 24
Bowers Roofing & Metal Wks 77
Braner, A. G..... 70
Bridgeport Crucible Co..... 71
Brombacher's Sons, Jacob.. 95
Bruce & Cook..... 83&96
Buffalo Register Works..... 25
Burton, W. J. & Co..... 84
Calvert, P. B. & Co..... 82
Cambridge Iron & Steel Co.. 81
Canfield, H. C..... 74
Canton Steel Roofing Co..... 87
Carton Furnace Co..... 8
Central Pattern Works..... 70
Central Stamping Co..... 65
Chamberlain, J. W. Co..... 73
Cheney, S. & Son..... 63
Chicago & Erie Stove Co..14&16
Cincinnati Corrugating Co.. 86
Cincinnati Stamping Co..... 89
Clad, V. & Sons..... 71
Clark, G. M. & Co..... 7
Clark Novelty Co..... 64
Clark, Quien & Morse..... 76
Clayton & Lambert Mfg. Co. 72
Clifton Springs Mfg. Co.. ... 66
Clough, R. M 91
Columbus Brass Co..... 75
Colwell Lead Co..... 74
Connecticut Plating Co..... 71
Connors, Wm... 87
Cooney, Seiner & Co..... 76
Cope, Geo. W 70
Corning Mfg. Co. 22
Correspondence School of Mechanics..... 62
Cortright Metal Roofing Co. 85
Couch Bros. Mfg. Co.....81
Covert Mfg. Co.... 69
Craig-Reynolds Fdy. Co..... 16
Crosby, G. A. & Co..... 90
Curtis & Curtis..... 74
Dalton-Ingersoll Co..... 72
Decatur Steel Roofing Co.... 89
Dixon, Jos., Crucible Co..... 75
Douglas, W. & R..... 75
Dover Machine Works..... 91
Eddy Electric Mfg. Co..... 69
Electric Boiler Co..... 22
Eller, J. H. & Co..... 86
Engelhart, Geo. H..... 64
Exeter Machine Works..... 1
Fairhaven Marble & Marbleized Slate Co..... 88
Ferracute Machine Co..... 89
Ferrosteel Co..... 15
Follansbee Bros. Co..... 80
Foskett & Bishop Co.. 62
Fostoria Steel Roofing Co.. 85
Frink, I. P..... 96
Friedley & Voshardt..... 86
Froelich, A., Estate of..... 71
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 88
Garry Iron & Steel Roofing Co..... 85
Gender & Paeschke Mfg. Co. 67
Giblin & Co..... 17
Glenmore Foundry & Machine Co..... 19
Globe Iron Roofing & Corrugating Co. 85
Globe Ventilator Co..... 70
Gobeille Pattern Co..... 70
Gordon, W. J..... 94
Gorton & Lidgerwood Co..... 1
Graff & Co..... 16
Greene, W. F 63
Griswold Mfg. Co..... 65
Gummey, Spering & Co ... 79
Gurney Heater Mfg. Co..... 17
Gurney Refrigerator Co..... 24
Halliday, M 85
Hamilton, John..... 96
Hanson & Van Winkle Co.. 69
Harrison, W. P. & Co..... 70
Hart & Crouse 19
Hartford Hollow Ware Co 64
Haslet, Flanagen & Co..... 64
Hess, Snyder & Co..... 23
Highland Foundry Co..... 1
Highton, Wm. & Sons..... 25
Holton Iron Roofing Co..... 84
Howard Furnace Co..... 26
Howard Thermostat Co..... 21
Howson & Howson..... 63
Hull, M. L..... 75
Illinois Zinc Co..... 81
Indiana Ladder Co 68
Iwan Bros..... 68
Jackson's Sons, W..... 21
Jenkins Bros..... 1
Jersey City Galvanizing Co. 78
Johnson, E. J. & Co 88
Jones, L. B. 23
Kanneberg Roofing Co..... 77
Kansas City Metal Roofing & Corrugating Co..... 87
Keene, Geo. C. & Co..... 91
Kelly, Thos. & Bro..... 72
Kemp, C M Mfg. Co..... 77
Kendrick Valve & Washer Co..... 63
Kernan Furnace Co..... 11
Keuffel & Esser Co..... 63
Kewanee Boiler Co..... 20
Kieckhefer Bros. & Co. 65
Kieley, T. .. 1
Kilbourne & Jacobs Mfg. Co. 72
Lambert, Stoughton & Cooper 81
Lawrence-Lette Elbow Co... 74
Lightning Dasher Egg Beater Co..... 64
Lindemann, A. J. & Hoverson Co..... 8
Littleford Bros..... 84
Lufkin Rule Co..... 94
Lyon, Conklin & Co.... 90
McClure & Co..... 96
McDaniel & Harvey Co..... 83
McLaughlin, J. K..... 70
Mahony, M..... 20
Marcy Stove Repair Co..... 71
Marlin & Co..... 76
Marston, I. G. & Co..... 74
Mason Regulator Co..... 1
May & Fiebeger 18
Merchant & Co., Inc..... 81
Merry, Geo. E..... 79
Meurer Bros. Co..... 82
Mica Mfg. Co..... 25
Michigan Stove Co..... 9
Millar, Chas. & Son..... 96
Miller, Jas. A. & Bro..... 84&85
Miner & Peck Mfg. Co..... 94
Montross Metal Shingle Co.. 84
Mowry, W. C..... 21
Mullins, W. H..... 85
Munsell, E. & Co..... 25
Myers, F. E. & Bro..... 75
National Wringer Co..... 67
Newark Regulator Co..... 74
New Castle Steel & Tin Plate Co..... 81
New York Central Iron Wks. 22
New York Elbow Co..... 64
New York Iron Roofing & Corrugating Co..... 86
New York Nickel Plating & Mfg. Co..... 68
Niagara Stamping & Tool Co. 89
Niles Mfg. Co..... 67
Noble, Chas. & Co..... 12
Obdyke, W. A. & Co..... 76
Obermayer, S. Co..... 71
Ohl, Geo. A. & Co..... 94
Osborn, J. M. & L. A..... 82
Ostrander, W. R. & Co..... 64
Packard Enameling Co..... 21
Palermo Mica Co..... 25
Paxson, J. W. & Co..... 71
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co..... 73
Peck-Williamson Heating & Ventilating Co..... 18
Peninsular Stove Co.....13
Phelps, Dodge & Co 80
Philadelphia Steel Roofing Co..... 86
Phillips Tin Plate Works.... 82
Pontyminster Old Style Ternes..... 81
Poorman Mfg. Co..... 95
Portsmouth Stove & Range Co..... 16
Presbrey Stove Lining Co... 70
Proudman Bros..... 74
Putnam Foundry & Machine Co..... 19
Republic Iron Works, ... 81
Ringen Stove Co..... 2
Robinson, J. M. & Co 95
Rochester Stamping Wks.... 66
Rome Mfg. Co..... 68
Root, A. L..... 88
Rutland Fire Clay Co..... 70
St. Louis Corrugating Co.... 84
St. Louis Stamping Co..... 68
S S. S. Conductor Co..... 77
Salem Nail Co..... 88
Sanborn, John..... 84
Sannders' D. Sons..... 75
Sayre Stamping Co..... 63
Schaffer, J. P..... 20
Schneider & Trenkamp Co.. 5
Severding, John..... 78
Sheppard, Isaac A. & Co..... 1
Shirk Refrigerator Co..... 24
Silver & Co 68
Sims Mfg. Co. 78
Smith & Winchester Co..... 19
Smith Co., H. B..... 20
Smith, J. D. Foundry Supply Co..... 70
Sonther, E. E. Iron Co..... 83
Special Notices..... 62
Sperry, D. R. & Co..... 68
Sproul & McGurrin..... 74
Standard Lighting Co..... 6
Star Mfg. Co..... 66
Stebbins, E. Mfg. Co..... 73
Steel Clad Bath Co..... 72
Stellwagen & Kynoch..... 62
Stiles & Parker Press Co.... 94
Stocking, E. B..... 62
Stuart & Peterson Co..... 73
Sykes Iron & Steel Roofing Co 85
Syracuse Stove Works..... 10
Taplin, Rice & Co..... 14
Tarbox Mfg. Co..... 71
Taylor Co., N. & G..... 96
Tinplate Decorating Co..... 85
Toledo Machine & Tool Co. 90
Troy Nickel Works..... 25
Troy Oil Stove Co..... 21
Tuttle & Bailey Mfg. Co..... 25
Union Heater & Supply Co.. 74
United States Heater Co.... 20
Valentine, M. D. & Bro. Co... 70
Van Namee, G. L. Mfg. Co.... 68
Vedder Pattern Works..... 70
Vogel, William & Bros..... 67
Walther & Christman..... 78
Warren Hardware Co..... 14
Washburne, E. G. & Co..... 70
Wayne, Jos. W..... 24
Weathered's, Thos. W. Sons 17
West, Jas. R..... 66
Wheeling Corrugating Co... 85
White, J..... 87
Wilson, R. M..... 73
Wister, L. & R. & Co..... 96
Wolff, L. Mfg. Co..... 77
Wood, Alan Co. 83
Wood Co., W. Dewees..... 90
Yates & Co..... 62
Zero Valve Co..... 76
Zucker, Levett & Loeb Co... 66

DOUBLE CORRUGATOR,

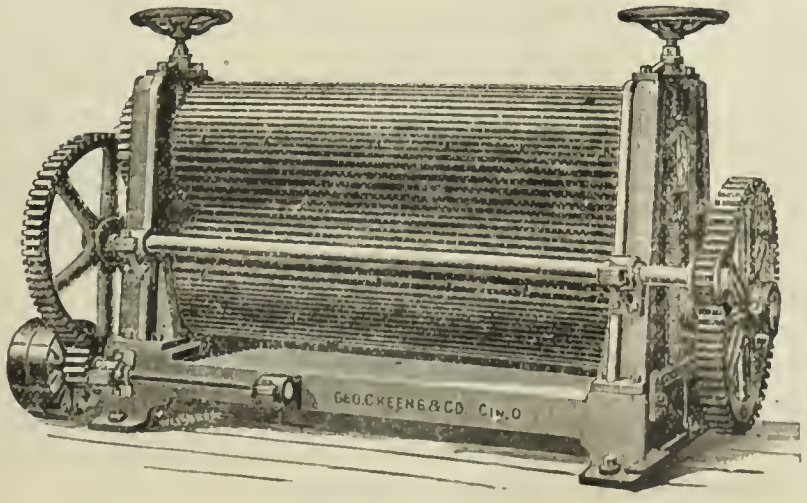
8 AND 10 FOOT.

The equipment of Iron Roofing Establishments a specialty.

Geo. C. Keene & Co.,

Cincinnati, Ohio,

Makers of the KEENE CORNICE BRAKE.



PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

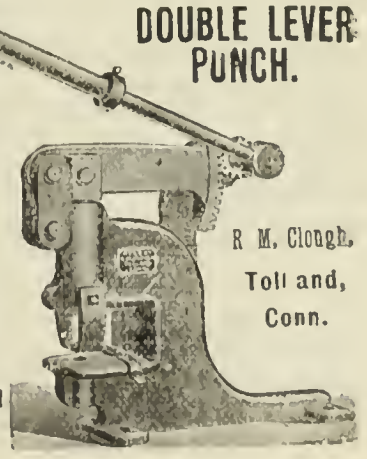
Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS, Dover, Del.

DOUBLE LEVER PUNCH.



Capacity, ½ in. hole in ¼ in. Iron.

Send for Circular and Price.

R M. Clough, Toll and, Conn.

CLASSIFIED LIST OF ADVERTISERS.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins. W. H., Salem, Ohio.
White, James, Brooklyn, N. Y.

Basin Plugs.
Canfield, H. O., Bridgeport, Conn.

Bathtubs.
Dalton-Ingersoll Co., Boston, Mass.
Peck Bros. & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.
Stuart & Peterson Co., Phila., Pa.
Wilson, R. M., Rome, N. Y.

Bread Pans.
Niles Mfg. Co., Niles, O.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
Eller, J. H. & Co., Canton, O.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Cincinnati Corrugating Co., Piqua, Ohio.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A. & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford, Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.

Cream Can Fittings.
Geuder & Paeschke Mfg. Co. Milwaukee, Wis.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Seiner & Co., Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct.

Dust Pans.
West, Jas. R., Gas City, Ind.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Clark, Quien & Morse, Peoria, Ill.
Proudman Bros., Meriden, Conn.
Severding, Jno., Richmond, Ind.
Walther & Christman, Cleveland, O.

Egg Beaters.
Lightning Dasher Egg Beater Co., Toledo, Ohio.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Electric Dynamo Mchines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winckle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand St., New York.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Foundry Facings Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Craig-Reynolds Foundry Co., Dayton Ohio.
Foskett & Bishop Co., 114 Liberty St., N. Y.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
May & Fiebeger, Akron, Ohio.
Michigan Stove Co., Chicago, Ill.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Peck, Williamson Heating and Ventilating Co., Cincinnati, O.
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, O.
Sheppard, Isaac A. & Co., Phila., Pa.

Furnaces, Plumbers' and Tinners'.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Couch Bros. Mfg. Co., Dayton, Ohio.
Hull, M. L., Cleveland, O.
Union Heater Supply Co., Detroit, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.
Packard Enameling Co., Warren, O.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N. Y.
Poorman Mfg. Co., Canton, Ohio.

Heaters, Steam and Hot Water.
American Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mch. Works, Boston, Mass.
Foskett & Bishop Co., 114 Liberty St., N. Y.
Fuller & Warren Co., Troy, N. Y.
Glenmore Foundry & Mch. Co., Phila., Pa.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Smith Co., H. B., 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass.
United States Heater Co., Detroit, Mich.
Weathered's, Thos. W. Sons, 139-143 Centre Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Stuart & Peterson Co., Philadelphia, Pa.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Silver & Co., Brooklyn, N. Y.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Piqua, Ohio.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Lacquers and Japans.
Hanson & Van Winkle Co., Newark, N. J.

Ladders.
Indiana Ladder Co., Indiana, Pa.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings.
Friedley & Voshardt, Chicago, Ill.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.

Metallic Lathing.
Jersey City Galvanizing Co., 112 John St., N. Y.

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palerino Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Obermayer, S. & Co., Cincinnati, Ohio.
Smith, J. D. Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker, Levett & Loeb Co., 8-14 Grand Street, New York.

Oil Cans.
Star Mfg. Co., Canton, Ohio.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Oil Heaters *(See Stoves and Ranges, Oil, Vapor and Gasoline).*

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Palm Oil.
Lambert, Stoughton & Cooper, Phila., Pa.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobelile Pattern Co., Cleveland, Ohio.
McLaughlin, John K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St. N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Plating Co., Phila., Pa.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers' Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Hull, M. L., Cleveland, O.
Kelly, Thos. & Bros., Chicago, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Sproul & McGurrin, Grand Rapids, Mich.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Union Heater Supply Co., Detroit, Mich.
Wilson, R. M. Rome, N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwan Bros., Streator, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumping Machines.
Columbus Brass Co., Columbus, Ohio.

Pumps, House and Farm.
Douglas, W. & B., Middletown, Conn.
Hess, Snyder & Co., Massillon, O.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water.
American Radiator Co., Chicago, Ill.
Exeter Machine Works, Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., N. Y.

Refrigerators.
Bower Mfg. Co., Fond du Lac, Wis.
Gurney Refrigerator Co., Fond du Lac, Wis.
Sbirk Refrigerator Co., Chicago, Ill.
Wayne, Jas. W., Cincinnati, Ohio.

Registers.
Buffalo Register Works, Buffalo, N. Y.
Ferrosteel, Cleveland, O.
Highton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman Street, New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N. Y.
Silver & Co., Brooklyn, N. Y.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel, Corrugated and Plain.
Acme Roofing & Supply Co., Canton O.
American Roofing Co., Cincinnati, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Decatur Steel Roofing Co., Decatur, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, O.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing & Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
St. Louis Corrugating Co., St. Louis, Mo.
Souther, F. E. Iron Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGE 91.

Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Lyon, Conklin & Co., Baltimore, Md.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgetou, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Shingles and Tiles, Metallic.
Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Wolff, L. Mfg. Co., Chicago, Ill.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.

Slaters' Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Sperling & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Couch Bros., Mfg. Co., Dayton, Ohio.
Union Heater Supply Co., Detroit, Mich.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Vosbardt, Chicago, Ill.
Mullius, W. H., Salem, O.

Steam & Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Coun.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Coun.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Pattern.
Baseom, H. Clay, Troy, N. Y.
Central Pattern Works, Dayton, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Stellwagen & Kynoch, St. Ignace, Mich.
Van Namee, G. L. Mfg. Co., Gouverneur, N. Y.

Stoves and Ranges.
Bibb, B. C. Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
Clad V. & Sons, Philadelphia, Pa.
Ferrosteel Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co., Boston, Mass.
Michigan Stove Co., Chicago, Ill.
Noble, Chas. & Co., Philadelphia, Pa.
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Syracuse Stove Works, Syracuse, N. Y.
Taplin, Rice & Co., Akron O.
Warren Hdw. Co., Warren, Ohio.

Stoves and Ranges, Gas.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Jones, L. B., St., Louis, Mo.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.
Aurora Vapor Stove Co., Cleveland, O.
Barstow Stove Co., Providence, R. I.
Clark, Geo. M. & Co., Chicago, Ill.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Troy Oil Stove Co., Troy, N. Y.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Pattern Rules.
Lufkin Rule Co., Saginaw, Mich.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Black Diamond Tin Plate Wks., Phila., Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Sperlug & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & I., A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila. Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Kleckhefer Bros. & Co., Milwaukee, Wis.

Tinware, Anti-Rusting.
Clifton Springs Mfg. Co., Clifton Springs, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Acme Roofing & Supply Co., Canton, O.
Berger, L. D., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N.Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, Geo. A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.

Torches, Plumbers' and Tinners.
Kendrick Valve & Washer Co, Syracuse, N. Y.

Traps and Vents.
Sproul & McGurrin, Grand Rapids, Mich.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Ch'mney Caps.
Canton Steel Roofing Co., Cantou, O.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Watering Pots.
Engelhart, Geo. H., Glenville, Ohio.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA, AND MEXICO, - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - - -	$1.00	SIX MONTHS, - - - - - - -	$22.10
ONE MONTH (5 Times), - - - - -	5.00	ONE YEAR, - - - - - - - -	40.30
THREE MONTHS, - - - - - - -	12.35		

Rates for larger spaces quoted on application.

DAVID WILLIAMS, Publisher.

96, 98, 100 and 102 Reade Street, NEW YORK. **59 Dearborn Street, CHICAGO.**

New York (Main Office), - -	96-102 Reade Street, - - - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509 Hamilton Building, - - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - - - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - - -	HENRY SMITH, Manager.
St. Louis, - - - - - -	Bank of Commerce Building, - - - - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.
AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

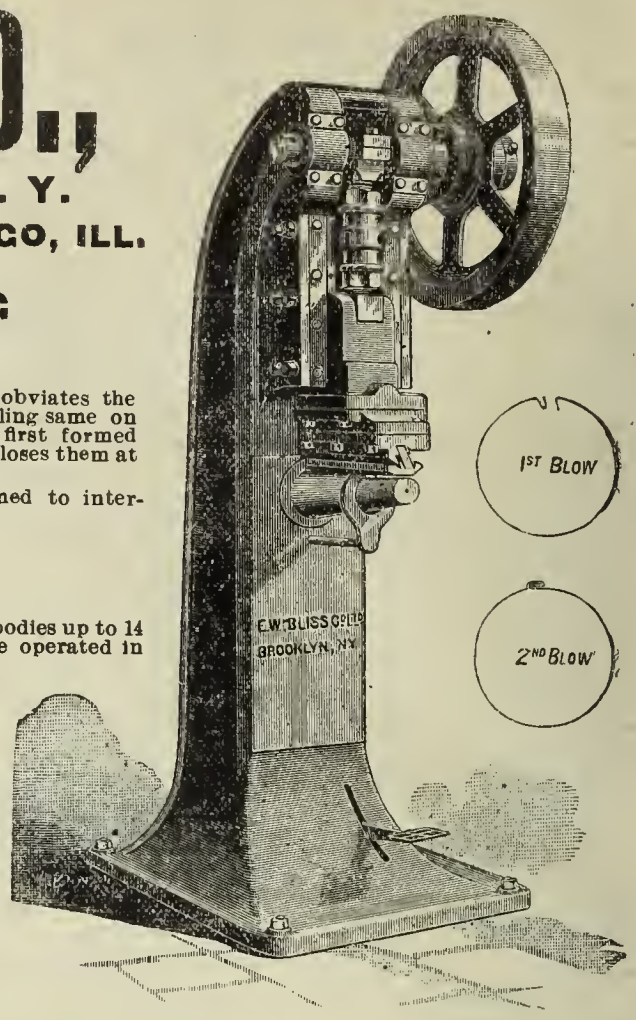
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.

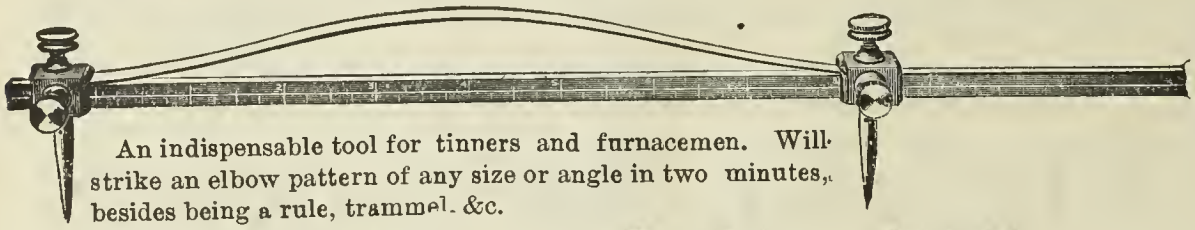


PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

DIES, SPECIAL MACHINERY &c.

THE STILES & PARKER PRESS CO.



An indispensable tool for tinners and furnacemen. Will strike an elbow pattern of any size or angle in two minutes, besides being a rule, trammel, &c.

"MAGIC" PATTERN RULE.

Price Reduced to $3.50 Net Cash.

Complete with Chart. Will pay for itself in a short time.

Send for Descriptive Circular.

LUFKIN RULE CO.

SAGINAW, MICH.



—ANOTHER MATTER.—Clara: "I hear your father has forbidden Mr. Higgins calling on you."

Cora: "No, you are mistaken."

"Did he not tell him last night never to darken his parlor again?"

"He did, but that referred to his turning down the lamp."—*Yonkers Statesman.*

—CREDITOR (determinedly): "I shall call every week until you pay this account, sir"

Debtor (blandly): "Then, sir, there seems every probability of our acquaintance ripening into friendship."—*Pearson's Weekly.*

—TRUE FICTION. — "What are you writing, Hawley?"

"A story. I'm going in for fiction."

"Really! For a magazine?"

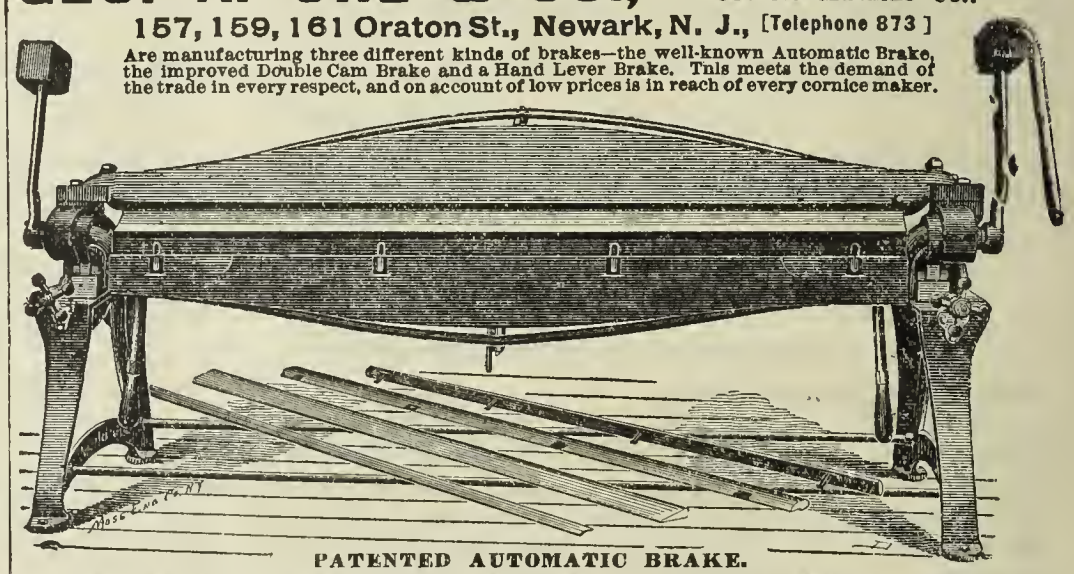
"No; for my tailor. He wants his money, and I'm telling him I'll send him a check next week."—*Harper's Bazar.*

GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co..

157, 159, 161 Oraton St., Newark, N. J., [Telephone 873]

Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892 Send for our illustrated catalogue.

PATENT AUTOMATIC CAN BODY

SEAMERS.

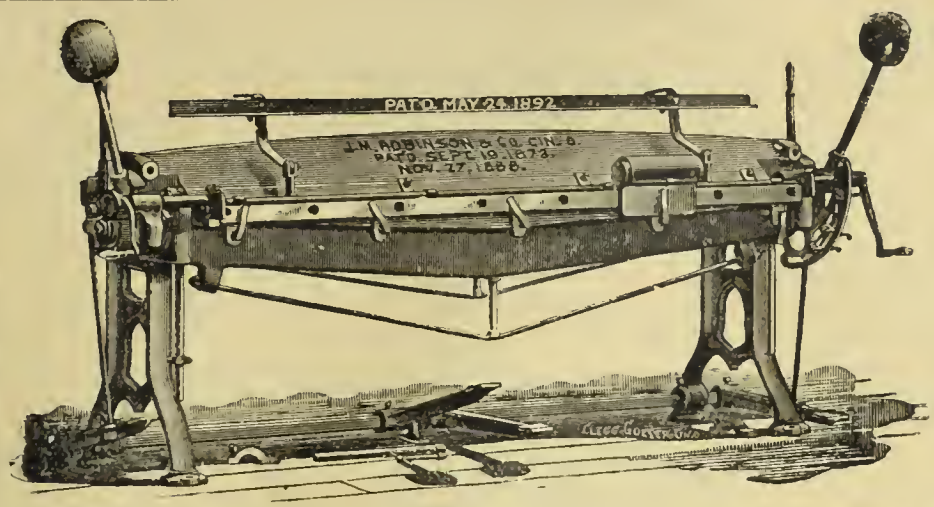
COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.

218 New St.,

W. J. GORDON, PHILADELPHIA, PA.

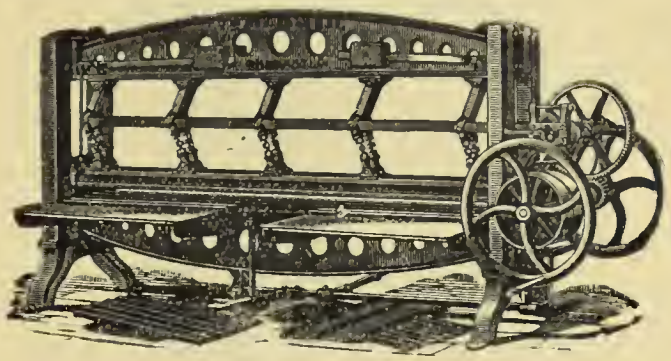


ROOFING MACHINE.

With Dies suitable, will form Sheet Metal Roofing, Siding, Ceiling, Weather-Boarding, Skylight Bars, Metal Lathing, Gutters, Ridge Caps, Escalloped Steel Sheets and Cattle Troughs.

THE "GLOBE" CORNICE BRAKE.

With which to form Sheet Metal into Cornice Mouldings, Ridge Caps, Skylight Bars; and with Beader and Gutter Former attached to Brake (price of which is extra), Bead and Form Gutters. Cornice manufacturers' Steel Straight Edges, 30 inch to 10 foot lengths.



J. M. Robinson & Co., Mfrs.,

225-229 W. Second St., Cincinnati, Ohio, U. S. A.



All set up ready to use. Price, $30.00. Freight allowed to points as far West as Missouri River, and as far South as Galveston, Tex.

FOR SALE BY

Hall & Carpenter, Philadelphia, Pa.
Austin & Doten, Boston, Mass.,
Hackett Hdw. Co, St. Paul, Minn.
and jobbers generally.

If your jobber can't supply you, order direct of the manufacturers.

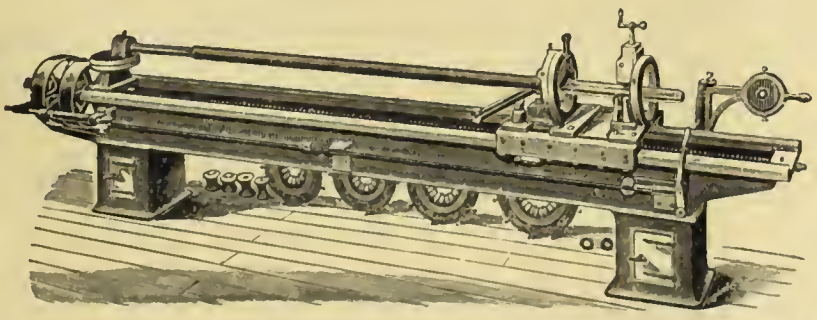
SEND FOR CATALOGUE.

Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

JACOB BROMBACHER'S SONS, - No. 30 Cliff St., N. Y. City.

Established 1833. Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

Sent, post-paid, on receipt of price, by

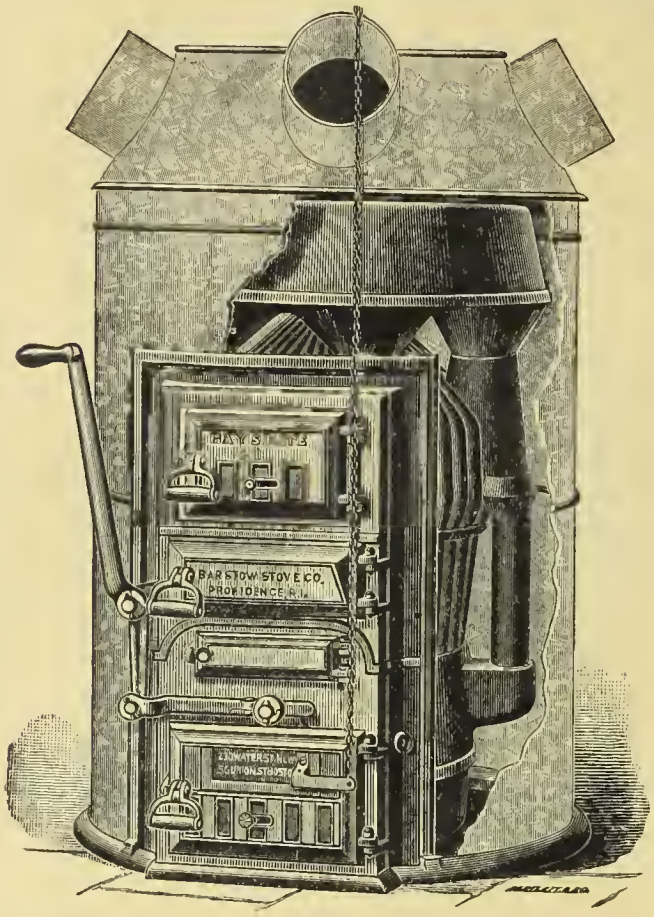
DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade Street, New York.

THE CELEBRATED

"Bay State" Furnace.

All Cast Iron, with Self-Cleaning Flues.
Adapted for Hard or Soft Coal.



Why not get our prices and send for descriptive circular?

BARSTOW STOVE COMPANY,

INCORPORATED,

BOSTON. PROVIDENCE, R. I. NEW YORK.

WHY

does the Genuine Taylor "OLD STYLE" brand of Roofing Tin remain sound after all the imitations rust out?

BECAUSE

the coating is AMALGAMATED with the Black Plate and **not spread over** by rolls and the use of acid flux as in modern processes.

N. & G. TAYLOR CO.,

Sole Manufacturers of the Genuine Taylor OLD STYLE Brand of Roofing Tin,

PHILADELPHIA.

CAUTION:

Look out for **Acid Flux** in the seams of **Continuous ROOFING TIN.**

THE GREAT CHURCH LIGHT
FRINK'S PATENT REFLECTORS
AND FIXTURES OF EVERY DESCRIPTION
FOR LIGHTING CHURCHES, HALLS AND PUBLIC BUILDINGS WITH OIL OR GAS ELECTRICITY
I. P. FRINK 551 PEARL ST. N.Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

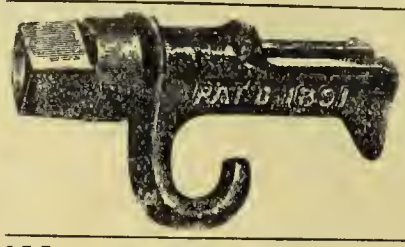
Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK,

TINNERS' TOOLS and MACHINES, TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

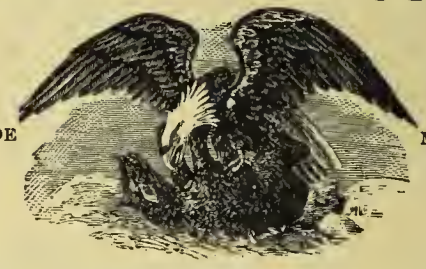
MADE IN ONE PIECE WITH HOOK.

By far the best Spout made. Greatly improved this season. More used every year than all others combined. Sold by leading jobbers everywhere, and to them by

CHARLES MILLAR & SON, Utica, N. Y.

Dealers Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY.

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON,

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. **Also** WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.

Branch Office, 111 Water St., Pittsburgh, Pa.

HAMILTON'S
BEST REDIPPED AMERICAN ROOFING TIN

is DIPPED AND REDIPPED by HAND, and is NOT coated by machines through ROLLS like some plates that are lauded so highly by the makers, and the coating on Hamilton's Best Redipped is as heavy on the TOP half of the sheet as it is on the BOTTOM half. You have scales, test it. We can furnish machine coated plates with 20 lbs. of coating to the box of I. C. 20 x 28 at $11.50 per box, fully equal to any of the so-called extra coated plates.

JOHN HAMILTON,
PITTSBURGH, PA.

McCLURE'S REDIPPED
ROOFING TIN.

AMERICAN MADE.

The finest and heaviest coated Roofing Tin made; guaranteed to contain **35 lbs. Coating** per 112 sheets.

A very important point in a Roofing Plate is to secure a uniform coating; **McClure's Redipped** is made by a process by which the coating is distributed **evenly over the sheet,** leaving no thick edges which are found on other "OLD STYLE" or "REDIPPED" plates, and which interfere to a great extent in working the sheets.

McClure's Redipped has been thoroughly tested and found to be of **superior quality** to any other "OLD STYLE" or "REDIPPED" plate made. A sample box will substantiate our claim.

McCLURE & CO., Pittsburgh, Pa.

Index to Reading Matter, Page 54

Index to Advertisements, Pages 91 - 93.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal

VOL. XLIII. NUMBER 13. | NEW YORK AND CHICAGO, MARCH 30, 1895. | ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

AMERICAN RADIATORS

HONESTLY CONSTRUCTED.
POSITIVE CIRCULATION.
ARTISTIC, SIMPLE, DURABLE.

Endless variety of styles.
Largest makers in the world.

AMERICAN RADIATOR COMPANY



NATIONAL.

NEW YORK. BOSTON. PHILADELPHIA. LONDON, ENG. ST. LOUIS. MINNEAPOLIS. DENVER.

111-113 Lake St., CHICAGO, ILL.

THE "GORTON" BOILER

FOR STEAM AND HOT WATER HEATING.

Economical in Fuel, Automatic, Self Feeding. A Steel Sectional Tubular Boiler.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.
197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

F&W Co.

GUARANTEED
STOVES FURNACES
RANGES & HOT-WATER HEATERS.
FULLER & WARREN CO. TROY, N.Y.

HOT AIR PARAGON FURNACES

ISAAC A. SHEPPARD & CO.
MANUFACTURERS
PHILADELPHIA, PA.
AND
BALTIMORE, MD.

SIX POINTS
1. FEWEST JOINTS. 2. EQUALIZED DRAFT
3. LARGEST RADIATING SURFACE
4. ABSOLUTELY SELF CLEANING
5. BALL BEARING GRATE
6. PERFECT ADAPTABILITY TO ANY KIND OF FUEL.

OUR FURNACE BOOK
"HINTS ABOUT HEATING"
MAILED FREE
IT WILL INTEREST YOU
IT MAY
HELP YOU

APOLLO BEST BLOOM

is the brand of galvanized iron that is true to gauge, flat (does not buckle), and is uniformly workable (bends without weakening).

GALVANIZED IRON

A first-class worker in galvanized iron knows, to his cost, the difficulties, in exacting work, imposed by refractory metal and sheets not flat, and the losses incurred through varying thickness.

EVERY SHEET GUARANTEED

The extra cost is too small to appear in small sales. The actual cost of his job to the worker is less, if well done

APOLLO IRON AND STEEL COMPANY
Pittsburgh Pennsylvania
WORKS AT APOLLO
Write for New Telegraphic Code.

HIGHLAND RANGES, HEATERS and STOVES
HIGHLAND FOUNDRY CO.,
BOSTON, - MASS.

SECOND EDITION.
"Kitchen Boiler Connections."
A Selection of Practical Letters and Articles
—RELATING TO—
Water Backs and Range Boilers.
Compiled from *The Metal Worker*.
71 Illustrations.
A Practical Helper. Price, $1.00.
DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

Nothing but praise on all sides for the celebrated
Front Rank Steel Furnace.

PRAISE
PRAISE — FRONT RANK STEEL FURNACE. — PRAISE
PRAISE

Drop us a line and get posted. We make Hot Water Heaters, too. Don't forget this.

Front Rank Steel Furnace Co.,
St. Louis, Mo.

BOILERS. EXETER RADIATORS.
EXETER MACHINE WORKS, BOSTON, MASS. Works, EXETER, N. H.

REGULATORS

For all purposes where any kind of Automatic Regulation of Air, water or steam is required.

MASON REGULATOR CO.,
Boston, Mass.



WHEN YOU WANT VALVES

and want them Simple, Strong and tight, easily and cheaply repaired, and Valves that last on High or Low Pressure steam, oils, acid, water, Gas, etc.,

We'll sell the JENKINS BROS. With our Trade-Mark And GUARANTEE them best.
JENKINS BROS., New York, Chicago, Philadelphia, Boston.

KIELEY'S - STEAM - SPECIALTIES.

Pump Governor, Return Steam and Drain Traps, Steam and Water Reducing Valves, Noiseless Back Pressure Valves, Water Arches and Oil Separators.
T. KIELEY, 7-17 W. 13th St., NEW YORK.

QUICK MEAL

GASOLINE STOVES. THAT'S WHAT THEY ARE.

Loose Grates.
No Warping of Tops.
Perfectly Balanced Doors.
Wrought Steel Unbreakable Bases.
Nickel Columns supporting High Shelf.
Tanks with Detachable, Cleanable Float.

Polished Latch Bars, will always stay cold.
Lead-Plate Everlasting Burner-Drums.
Handsome Folding Teapot Brackets.
Nickel Rails on High Shelf.
All Parts are Rust-Proof.
Nickel Towel Bars.



Ringen Stove Co.

ST. LOUIS.

Also the most complete line of Quick Meal Gas Stoves and Ranges.

Carton

Hot Water & Steam Boilers & Furnaces.

Our Water Boiler.

Nipple Connections.

No Packed Joints.

Easily Cleaned.



Vertical Water Ways.

Double Corrugated Fire Box.

For HARD or SOFT COAL.

MR. WILLIAM J. BALDWIN, M.E., the HEATING ENGINEER, of NEW YORK, says in his trial of THIS boiler:

"The equivalent evaporation per pound of combustible from water at 212° Fah." "to 5 pounds pressure of steam is 11.02 pounds of water."
"The equivalent evaporation of water from 212° Fah. to 5 pounds steam pressure," "per square foot of average boiler surface per hour, is 2.368 pounds of water."
"You will note that when the rate of combustion is equal to 5 pounds of good an-" "thracite coal per square foot of grate per hour, that one square foot of average boiler" "surface evaporated sufficent steam for 10 square feet average radiation; an exceed-" "ingly high efficiency and rarely obtained in practice."
"The low temperature at which the gases of combustion entered the chimney," "ranging from 3 to 21 degrees above the temperature of the steam, shows that the" "boiler utilizes about all the available heat of the fuel."

Send for our NEW HOT WATER AND STEAM CATALOGUE AND PRICE-LIST and WRITE for DISCOUNTS.

SOLD TO THE TRADE ONLY.

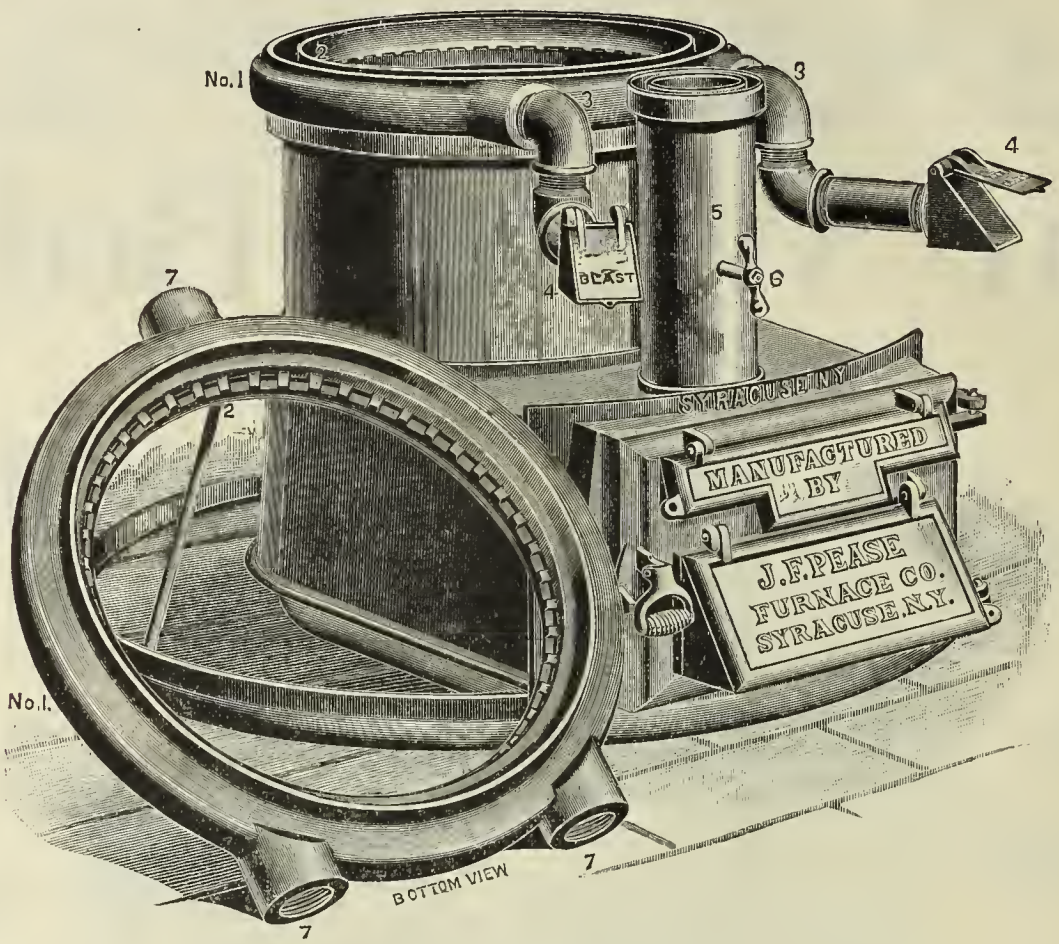
MANUFACTURED BY

CARTON FURNACE CO., UTICA, N. Y.

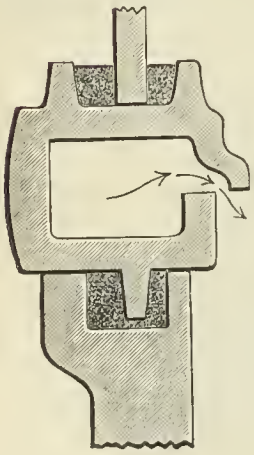
ESTABLISHED IN 1847.

ECONOMY

AIR BLAST ATTACHMENTS.

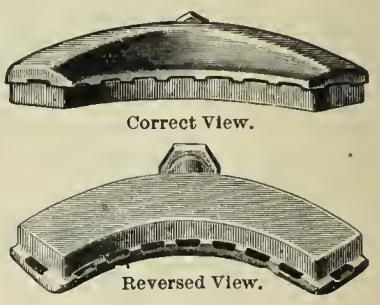


This cut illustrates our new Air Blast Ring, designed to fit our Regular, Double Radiator, Low Down, Tropic, and 1895 Patterns. Continued tests have proven the thorough adaptability of this appliance to apparatus for burning soft coal. It has many features worthy of the careful investigation of the trade. We cannot tell all about it here. Send for advance circular describing it.



This cut shows a transverse sectional view of the ring. Notice the slot. It is patented. Our circular tells why.

These two views show our Sectional Air Blast for any pattern. The use of it stimulates the burning of hard fuels.


Correct View.

Reversed View.

SEND FOR NEW 1895 CATALOGUE.

J. F. PEASE FURNACE CO.,

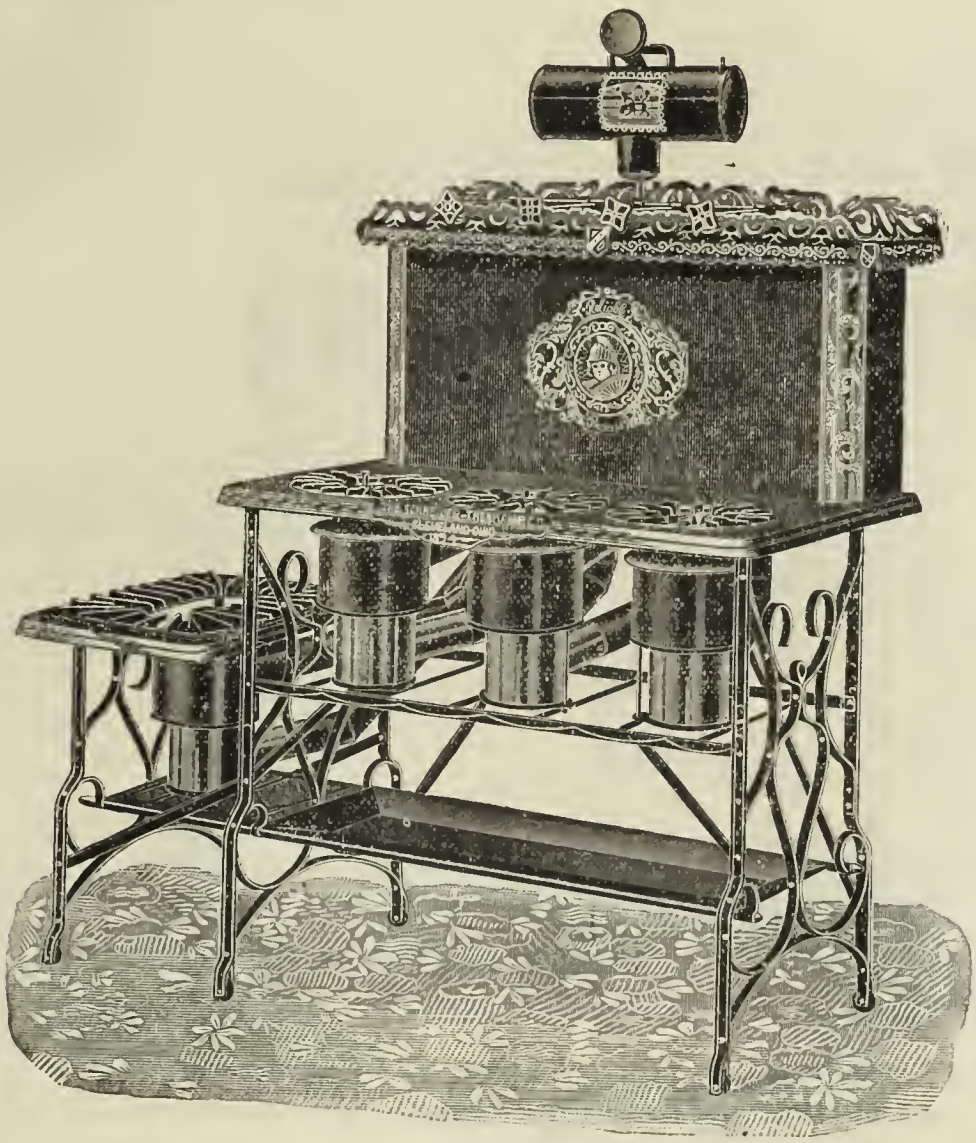
Main Office and Works, **SYRACUSE, N. Y.**

86 Lake St., Chicago. 228 Franklin St., Boston. Franklin & Burnham, 284 Pearl St., New York. Jno. F. Bannon & Co., 1804 La Fayette Ave., St. Louis, Mo. E. E. Palmer, Mgr., 1640 N. Third St., Harrisburg, Pa.

There are OTHERS,

But none that compare with the "Reliable."

SEE ? ? ?



This is not the only one,

Oh my, no. There ARE others,

as illustrated in our 1895 Catalogue, which can be had by writing

THE SCHNEIDER & TRENKAMP CO.,

67 Lake Street, Chicago. Cleveland, O.

OR OUR AGENTS:

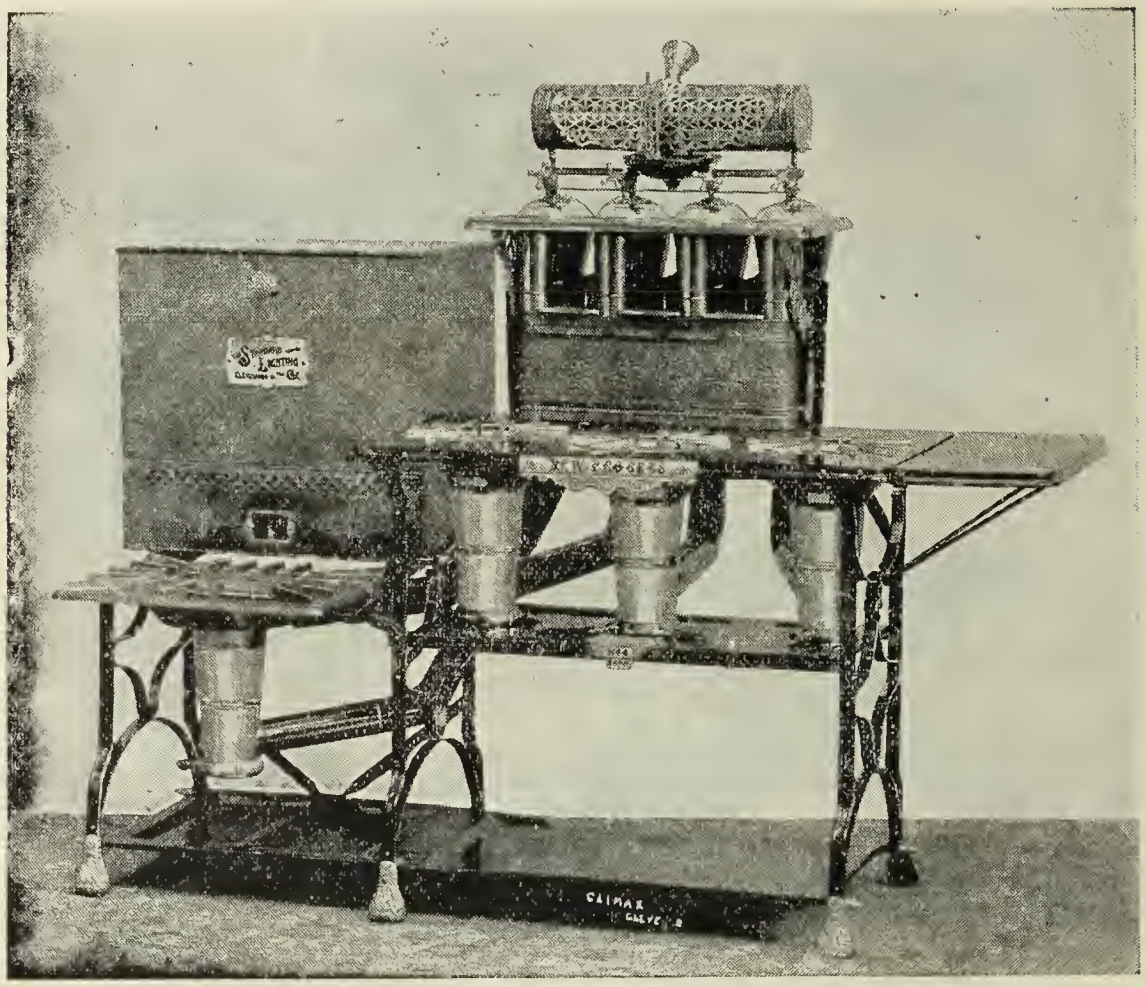
THE SCHNEIDER & TRENKAMP CO., Chicago, Ill.—State of Illinois and Southern Wisconsin.
WIESTER & CO., San Francisco, Cal.—The Coast.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota, Montana, and Northern Wisconsin.
A. L. WEST, Des Moines, Ia.—State of Iowa.
WM. LYLE DICKEY & CO., Omaha, Neb.—State of Nebraska and Council Bluffs, Ia.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo
HERBOTH MERCANTILE CO., St. Louis, Mo.—States of Arkansas and Missouri.
HUNTER & STREHLOW, Peoria, Ill.—Peoria and Suburbs.
CRIBBEN, SEXTON & CO., Denver, Colo.—Colorado, Wyoming, New Mexico, Arizona, Utah and Idaho.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan
CHAS. F FOX Dayton, O.—S. W. Ohio and S. E. Indiana.
O. K. STOVE & RANGE CO., Louisville, Ky.—State of Kentucky.
F. A. KLAINE & CO., Cincinnati, O.—Cincinnati and Suburbs.
THE H. HALLER MFG. CO., New Orleans, La.—State of Louisiana.
T. A. SNOW, Chattanooga, Tenn.—Chattanooga and Suburbs.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Georgia, Alabama and Tennessee.
C. C. HEATH & CO., Baltimore, Md.—States of Delaware, Maryland Virginia and West Virginia.
H. N CLARK, Boston, Mass.—New England States.
HARRY BROS., Dallas, Texas.—North. & West. Texas.
J. R. MORRIS HDW. CO., Houston, Texas.—S. E. Texas.
J. SCHULTZE, Jr., San Antonio, Texas.—S. W. Texas.
THE A. J. HARWI HDW. CO., Atchison, Kas., State of Kansas and Oklahoma.
S. FAITH & CO., Philadelphia, Pa.—Eastern Pennsylvania and New Jersey.
HUNNICUTT & BELLINGRATH, Atlanta, Ga., and Vicinity.

A Good Baker—A Record Breaker.

A HOME MAKER!

No Wonder 'tis such a "Taker."

The "NEW PROCESS!"



Here's its picture "pulled" in its "95" clothes—gotten up to look well and behave better —to lighten the burden of the housekeeper *twice over* more than any other article of furniture in the house.

And it is doing it in Thousands of Homes.

BUY IT! TRY IT!

Catalogue now waiting for YOU, free.

——MADE ONLY BY——

THE STANDARD LIGHTING CO.,

CLEVELAND, OHIO.

WE HAVE ALL THAT IS BEST AND NEW IN A FULL LINE OF GAS STOVES AND RANGES.

The "New Process" Vapor Stove will be sold for the season of 1895 by the following Jobbers:

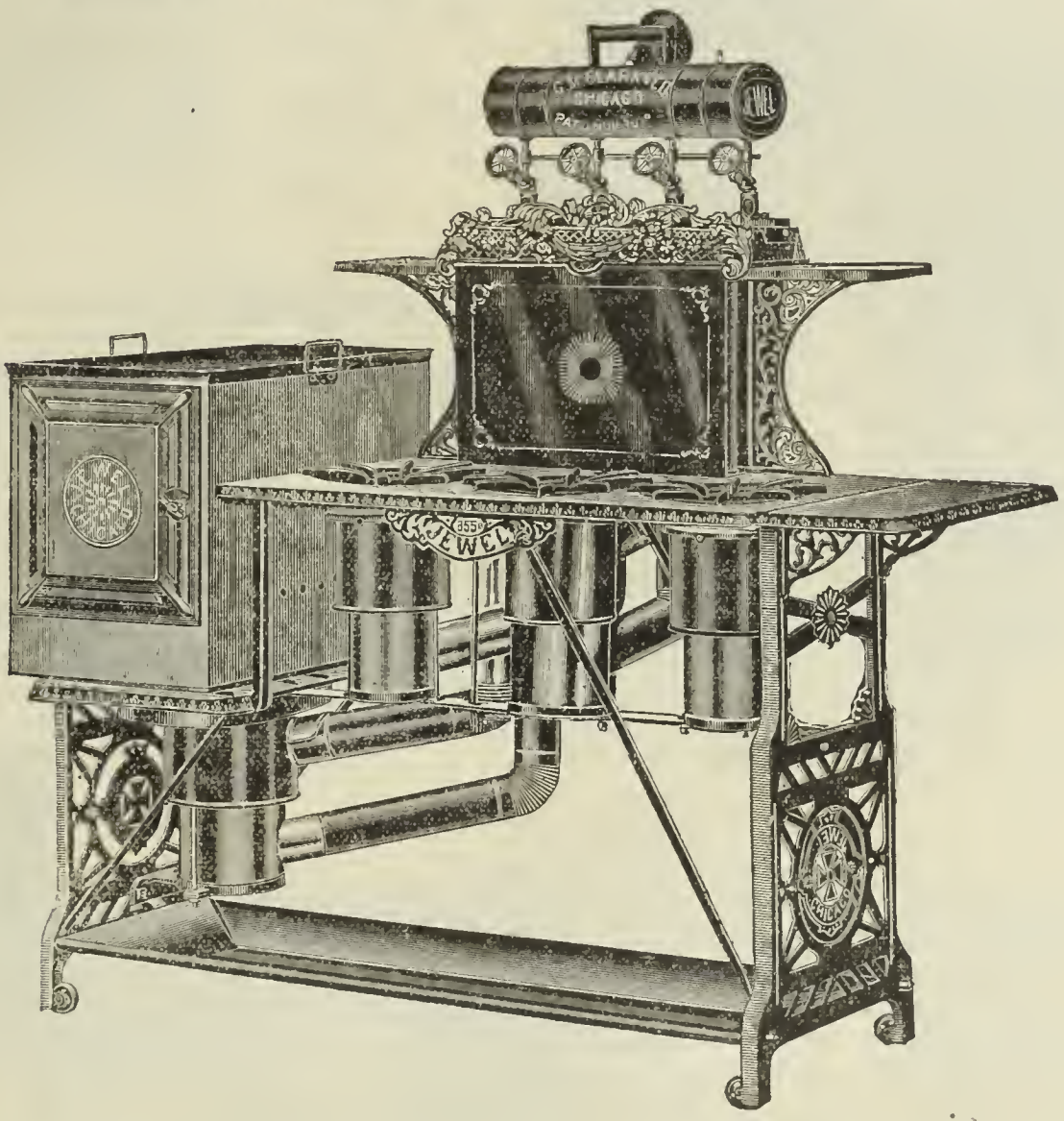
Eugene Munsell & Co., 218 Water St., New York, N. Y.
F. M. Borden & Bro., 118 North 2d St., Philadelphia, Pa.
Bissell & Co., Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, Ohio.
Dodd, Werner & Co., Cincinnati, Ohio.
Bridgeford & Co., Louisville, Ky.
Geo. E. Cooper & Co., Nashville, Tenn.
Septoline & Safety Oil Co., 15 Dauphine St., New Orleans, La
Wagner & Chabot, San Antonio, Texas.
The Townley Stove Co., Terre Haute, Ind.
Milton Rogers & Sons, Omaha, Neb.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
H. Leonard & Sons, Grand Rapids, Mich.
D. S. Cook, 171 Lake St., Chicago, Ill.
The Northwestern Hardware Co., St. Paul, Minn.
Knapp & Spalding Co., Sioux City, Iowa.
Townley Metal Co., Kansas City, Mo.
G. A. Pauly & Co., 2703 Cass Ave., St. Louis, Mo.
Kellogg & Stokes, 1408 Wynkoop St., Denver, Colorado.
Hoffman & Weller, Los Angeles, Cal.
H. Wetter Mfg. Co., Memphis, Tenn.

A SUB-FLAME

Is Needed Every Day of the Year.

JEWEL PROCESS STOVES

HAVE ALWAYS HAD IT.



There is nothing revolutionary in the changes in the Jewel construction. All the result of steady, studied improvements. We offer the best Process Stoves manufactured.

WRITE FOR CATALOG.

George M. Clark & Company,

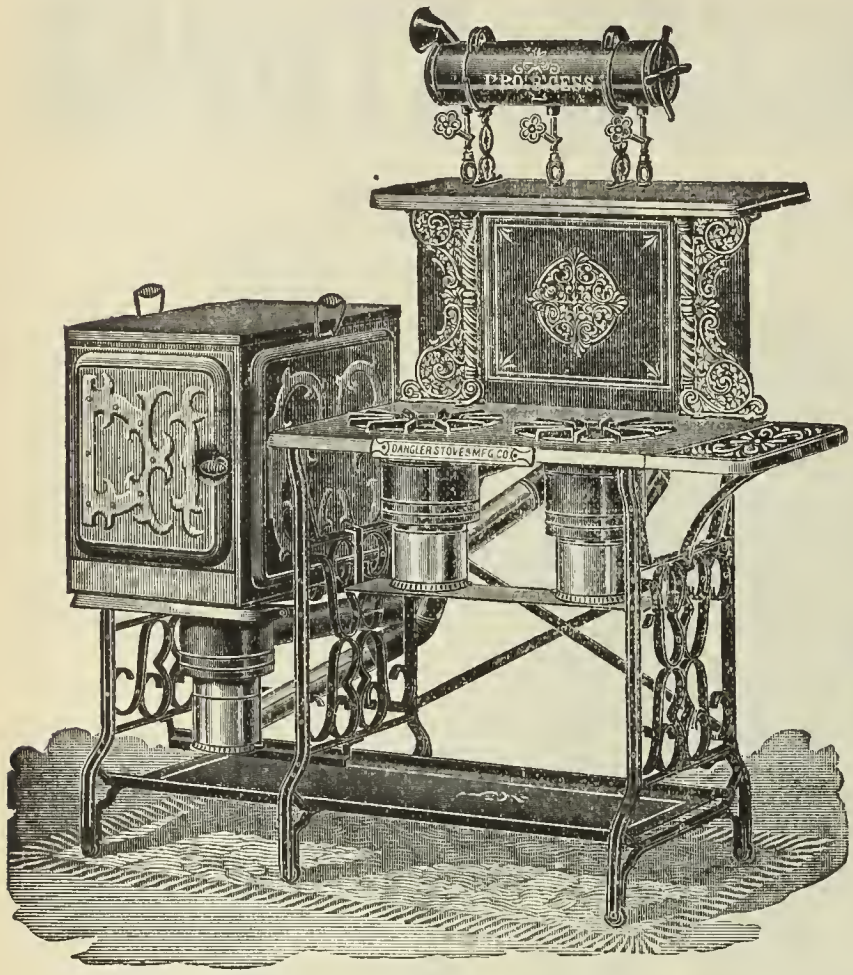
MAKERS,

149-161 Superior Street, - - CHICAGO.

SPECIAL AGENTS FOR JEWEL GASOLENE STOVES:

STRATTON & TERSTEGGE, Louisville, Ky.
H. SANDMEYER & CO., Peoria, Ill.
THE CINCINNATI TIN & JAPAN CO., Cincinnati, Ohio.
GEORGE M. CLARK & CO., Boston, Mass.
J. ELWOOD YEAGER, Philadelphia, Pa.
WALBRIDGE & CO., Buffalo, N. Y.
BARSTOW STOVE CO., New York, N. Y.
W. W. MONTAGUE & CO., Los Angeles and San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
HOWARD W. PEAK, Fort Worth, Texas.
DEMMLER BROS., Pittsburgh, Pa.
RICE, BORN & CO., Limited, New Orleans, La.
GREAT WESTERN STOVE CO., Leavenworth, Kan.
WM. FRANKFURTH CO., Milwaukee, Wis.

Facts of Interest to the Public.



Our "PROCESS" for 1895, we can say unqualifiedly, is the

MOST PERFECT WORKING

PROCESS STOVE EVER PLACED ON THE MARKET, and HAS NO EQUAL.

In calling attention to our

NEW GEM STOVE,

We offer the trade a STOVE FOR THE PEOPLE and FOR THE TIMES.

THE GEM STOVE is CONVENIENT

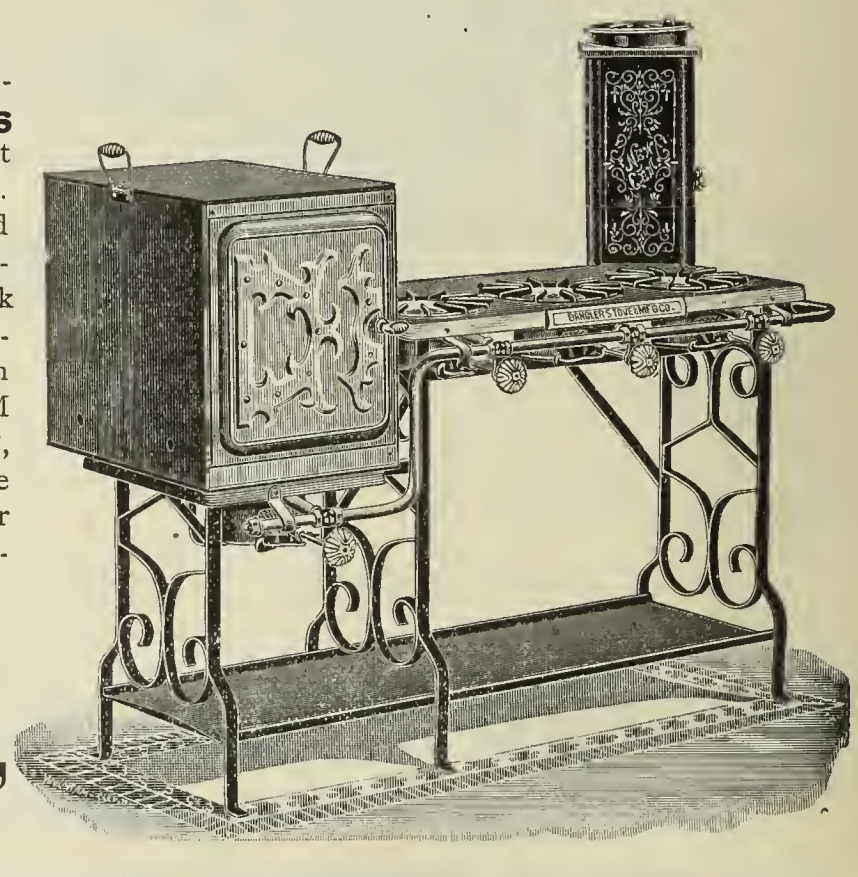
in SIZE, with the same sized flame as the PROCESS doing the same amount of work with **less fuel,** and at an original cost of only about ONE-HALF that of the regular high Stoves. This Stove is ABSOLUTELY our own, and CAN BE MADE ONLY BY US, and as pioneers in this business, the public naturally look to us for progress, while some of our competitors, who can only make the old line, call such improvements, "an innovation." Our GEM and PROCESS, together with our DELIGHT, celebrated JUNIORS, Individual and Single Generator Burner Stoves, &c., will give our trade a decided advantage over their competitors.

Write for Catalogue, 1895.

—THE—

Dangler Stove & Mfg. Co,

CLEVELAND, O.



WHOLESALE AGENTS:

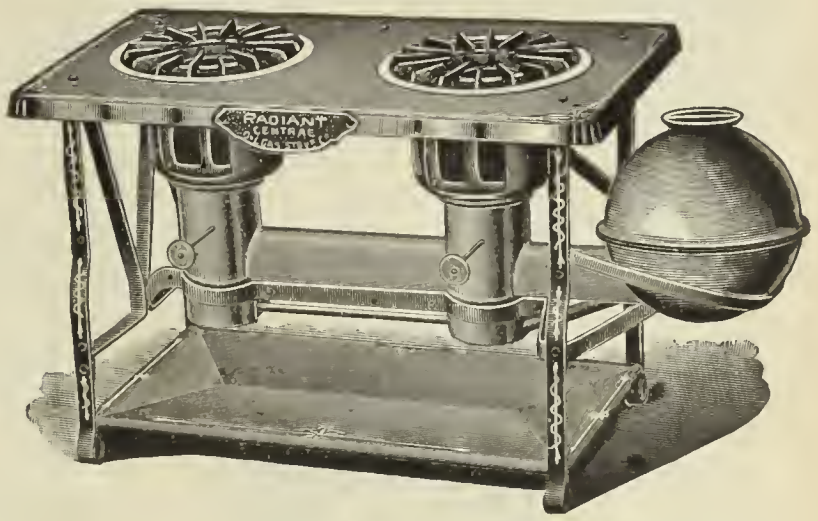
E. H. Huenefeld, Cincinnati, O.
Standart Bros., Detroit, Mich.
Mt. Penn Stove Works, No. 111 N. 2d St., Philadelphia.
Mt. Penn Stove Works, Reading, Pa.
Barstow Stove Co., No. 228 Water St., New York.
Barstow Stove Co., No. 56 Union St., Boston.
Home Stove Co., Indianapolis, Ind.
J. P. Lindeman & Sons, Milwaukee, Wis.
R. Robinson & Sons, Chicago, Ill.
Richards-Conover Hdw. Co., Kansas City, Mo.
The Stollberg-Clapp Co., Toledo, O.
Weber & Gebhart, Dayton, O.
Bradley & Munk, Columbus, O.
Foster-Stevens Co., Grand Rapids, Mich.
The Schaab-Puff Stove Co., St. Louis, Mo.
Dunlay & Geisler, Houston, Texas.
A. Baldwin & Co., Ltd., New Orleans, La.
M. F. Tallmage, Buffalo, N. Y.
W. E. Galbreath, S. E. cor. Lombard and Light Streets, Baltimore, Md.
The Ochsner & Orcutt Co., Sioux City, Iowa.

SHEET STEEL

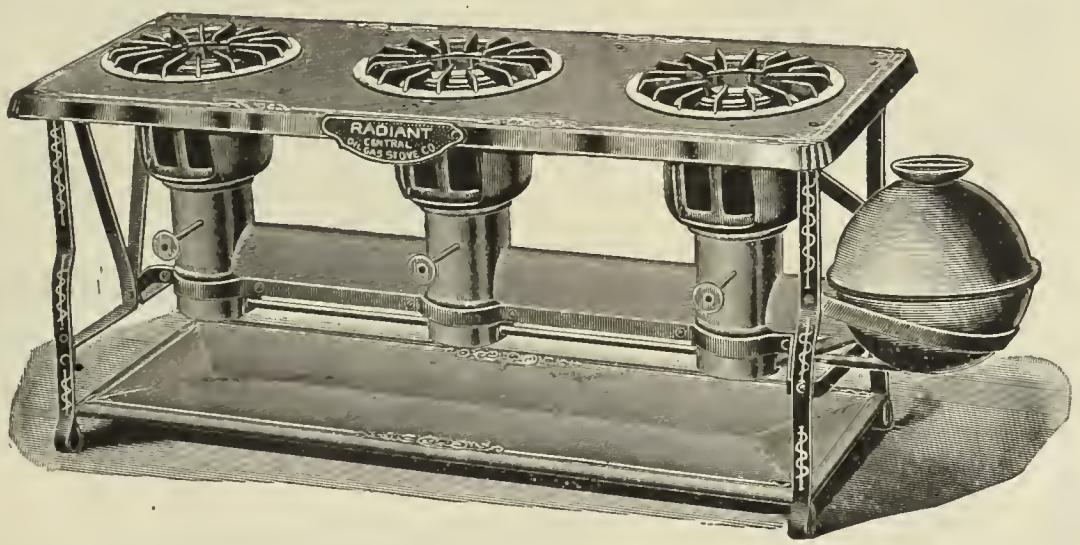
CIRCULAR BURNER, CENTRAL DRAFT, OIL COOK STOVES.



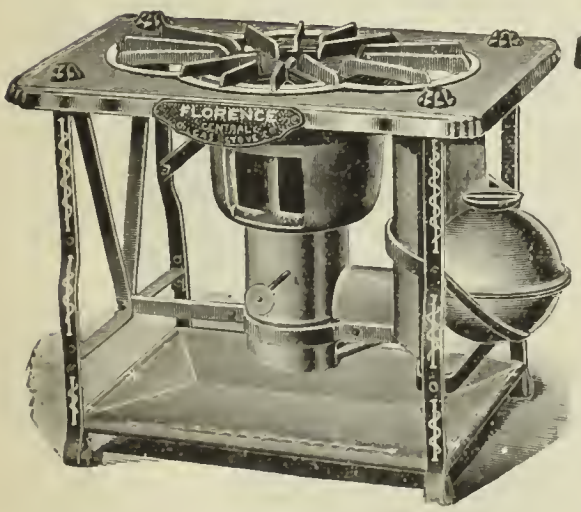
Radiant, Sheet Steel, No. 8-1.
Has one 8-inch Circular Burner. Height, 16 inches. Size of Top, 14 x 14 inches.



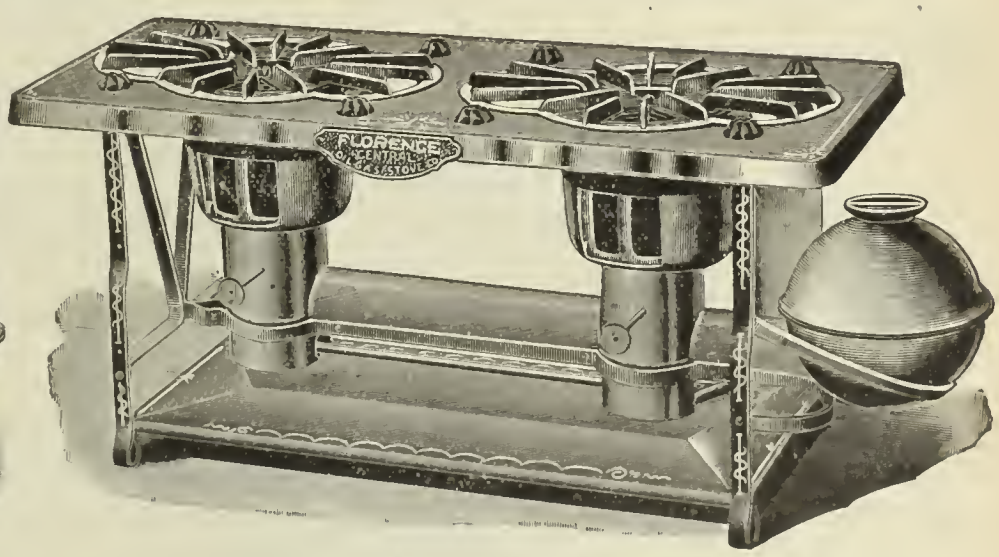
Radiant, Sheet Steel, No. 8-2.
Has two 8-inch Circular Burners. Height, 16 inches. Size of Top, 14 x 24 inches.



Radiant, Sheet Steel, No. 8-3.
Has three 8-inch Circular Burners. Height, 16 inches. Size of Top, 14 x 34 inches.



Florence, Sheet Steel, No. 10-1.
Has one 10-inch Circular Burner. Height, 16 inches. Size of Top, 12 x 19 inches.



Florence, Sheet Steel, No. 10-2.
Has two 10-inch Circular Burners. Height, 16 inches. Size of Top, 14 x 34 inches.

We furnish ovens for these stoves. Our Nos. 2 and 3 Florence and Embossed Sheet Steel Ovens are admirably adapted to these stoves and will give perfect satisfaction.

All of these Stoves are made of the very Best Material and thoroughly First Class in every Particular, and are Highly Finished in Japan and Colors.

WRITE FOR FURTHER INFORMATION AND PRICES.

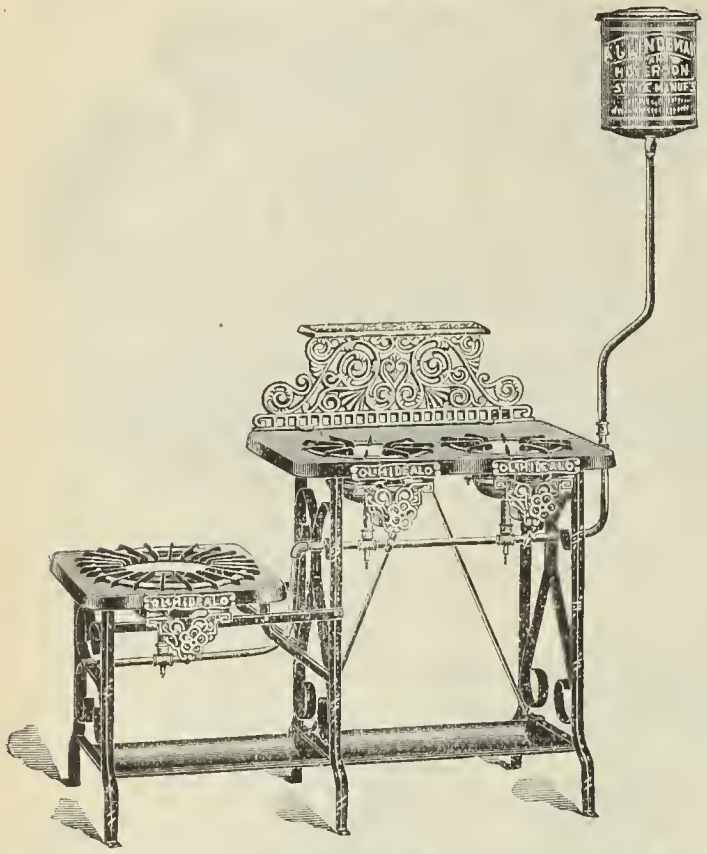
CENTRAL OILGAS STOVE COMPANY,

Manufacturers of Gas, Oil and Oil Vaporizing Stoves and Fixtures. Over 200 different styles and sizes for Cooking and Heating purposes, including over 20 styles of Lamp Stoves.

BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO.

SOMETHING ENTIRELY NEW.

The L. & H. IDEAL



Burns a flame like a Process, but twice as strong. Patented. It is truly an Ideal gasoline stove. Price low and within the reach of everybody. The latest invention in Gasoline Stoves. Send for new catalogue. It contains the largest assortment of Stoves, Ranges, Ovens, &c., for gas, gasoline and kerosene.

A. J. LINDEMANN & HOVERSON CO.,

Branch House, Chicago, Ill. MILWAUKEE, WIS.

P. S.—Notice this advertisement. It will show a new improved stove every week.

VAN'S

Plantation Ranges.

With Broiler Attachment.

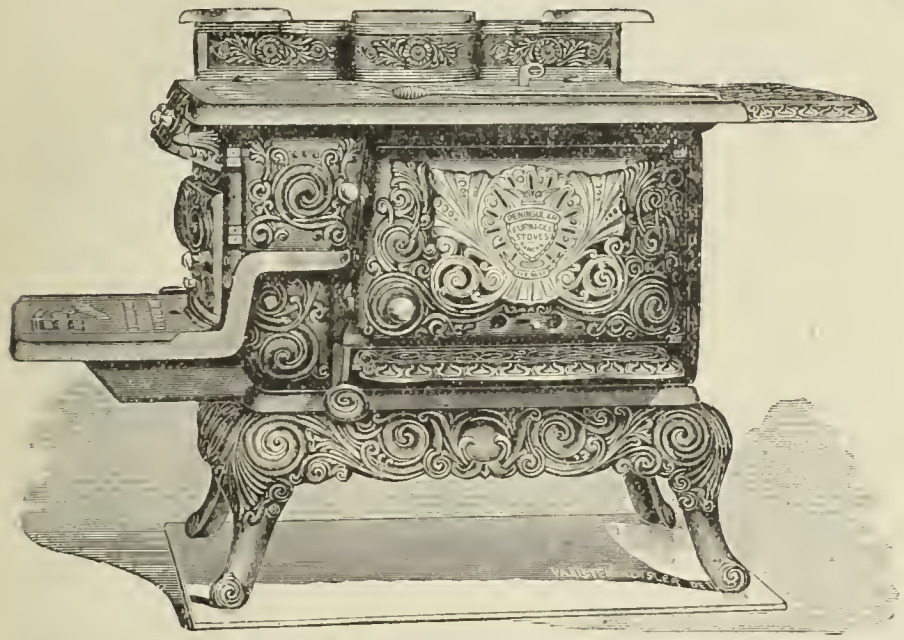
The finest, most convenient and best family range ever offered for soft coal, wood or natural gas. Write for our prices before buying elsewhere. It will pay you.



THE
JOHN VAN RANGE CO.,
Mfrs. of Wrought Steel Ranges, all sizes, and styles,
Cincinnati, Ohio.

THE HOME PENINSULAR

FOUR-HOLE RANGE.



For Coal, Coke,
Wood or Natural Gas.

FROM

ENTIRELY
NEW PATTERNS

OF THE

VERY LATEST DESIGN and IMPROVEMENTS.

Square and Reservoir

Made in Two Sizes of Oven, 18 and 20 inch.

ASK FOR PRICES.

The Domestic Peninsular

SIX-HOLE RANGE.

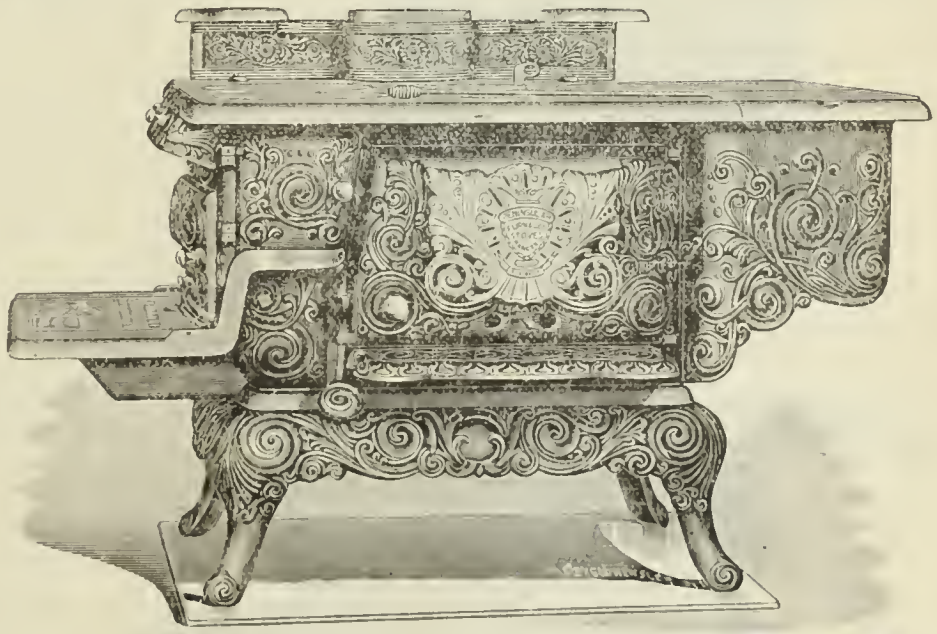
AN UP-TO-DATE,
MODERATE PRICED,
HEAVY and HANDSOME
Coal or Wood Range.

Square and Reservoir.

WITH

Spacious Oval Fire Box,
Ventilated Square Oven,
Large Sheet Flue,
Elaborate Nickel
Oven Door Panel, Oven Shelf
AND
Teapot Shelves.

IN TWO SIZES, 18 and 20 inch Ovens.



WRITE FOR CATALOGUE AND DISCOUNTS.

THE

PENINSULAR STOVE COMPANY,

DETROIT. CHICAGO. BUFFALO.



CHARLES NOBLE & CO
LIBERTY
STOVE WORKS
PHILA. PA.

Liberty Stove Works.

HOME LIBERTY RANGE,

With Horizontal Boiler.

TWO SIZES.

Five or six holes. Collar on top or back.
Right or left hand ovens.
Plain or duplex grates.
With or without High Closet.
With Low Closet or **Base.**

Especially adapted to BUILDING TRADE.



PRIZE LIBERTY RANGE.

For VERTICAL BOILER.

WITH ALL THE VARIATIONS AS ABOVE.

Also adapted for setting in between brick jambs.



PRIZE LIBERTY RANGE,

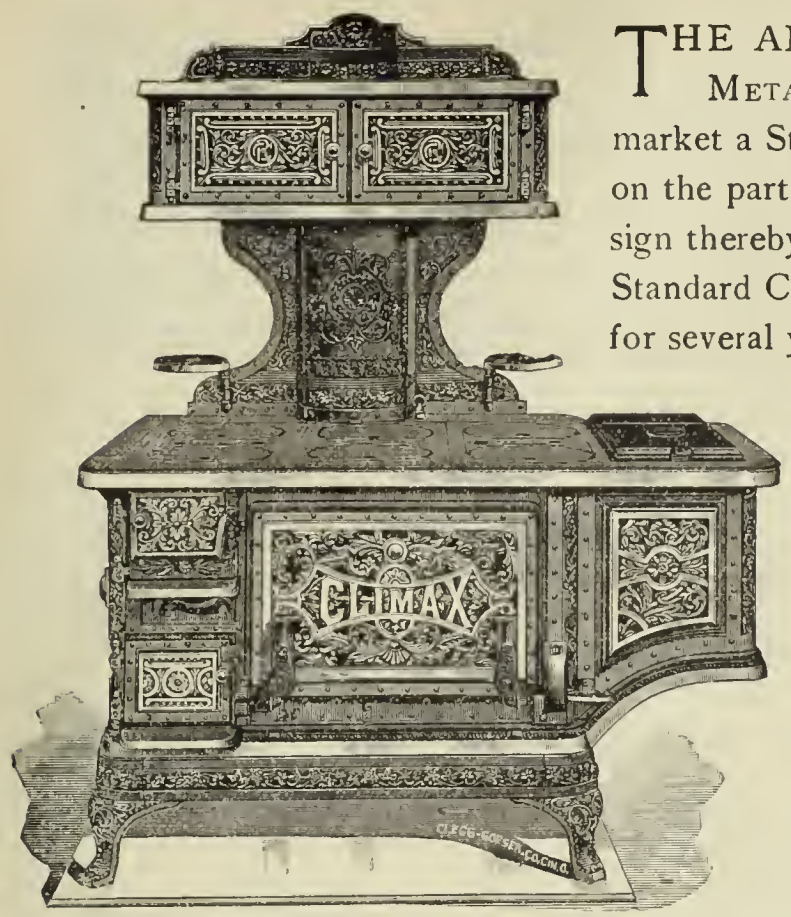
With Feet and Skirting.

Open or closed ends, with the same variations.

Correspondence solicited.

CHARLES NOBLE & CO.,

PHILADELPHIA.



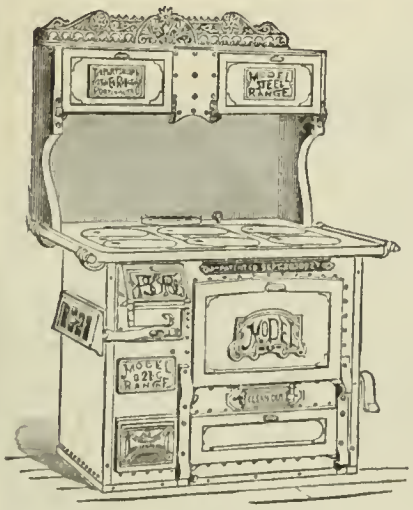
THE ANNOUNCEMENT in a recent issue of THE METAL WORKER that we are soon to place on the market a Steel Climax Range having prompted the inquiry on the part of some of our patrons as to whether we design thereby to abandon the manufacture of our Celebrated Standard Climax Range, which has maintained supremacy for several years as an established leader of its class and against which not a single complaint has been filed in our office, we desire by this to inform the trade that the reputation of the Climax Range and constantly increasing demands for same is such as to preclude the possibility of abandonment if we felt disposed to do so. The Range, we are pleased to say, is more popular than ever, and the manufacture of same will be continued in all its varied conventional styles and sizes, and we sincerely trust that none will be deceived into a belief that an ***imitation*** now being offered to the trade is as good as the initial construction, which can only be procured of

TAPLIN, RICE & CO., AKRON, OHIO.

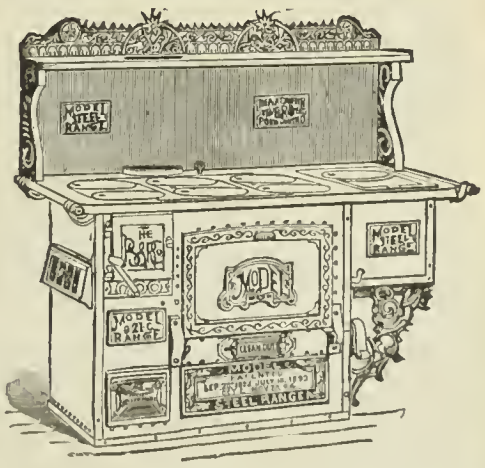
BEHOLD! The Leaders.

You can't see the others—
too far behind.

THE "MODEL" STEEL RANGES



have done more to popularize Steel Ranges than any other one factor. Why? Because they are absolutely the best, and the price brings them within the reach of all.



Agents:

R. ROBINSON & SONS, Chicago.
C. F. HAKE & SONS, Cincinnati.
HOME STOVE CO, Indianapolis.
W. E. ANTHONY & CO., Detroit.
BRADLEY, MUNK & CO., Columbus.

THE

Portsmouth Stove AND Range Co.,

Portsmouth, O.

---

100 Styles and Sizes of Superb Helper Steel Ranges made with Patent Ovens. Illustrations mailed on application to the Chicago & Erie Stove Co., Chicago, Ills., or Erie, Pa.

Cleveland's Population is 362,000.
Cleveland has Nine Railways.
Cleveland has 60,000 Mechanics.
Cleveland has Six Opera Houses.
Cleveland has One Ferrosteel Company.
Cleveland has over 200 Churches.
Cleveland has 30 Musical Associations.
Cleveland makes the Largest Telescopes.
Cleveland has 500 miles of Streets.
Cleveland has an area of 30 miles.
Cleveland has One Ferrosteel Company.
Cleveland has 250 miles of Street Railways.
Cleveland's Water Works cost over $6,000,000.

Cleveland has One Ferrosteel Company.
Cleveland's Vessels are worth $18,000,000.
Cleveland is the largest Shipbuilding Port.
Cleveland has the largest Bolt and Nut Works.
Cleveland has over 500 Lodges and Societies.
Cleveland has One Ferrosteel Company.
Cleveland has 14 Libraries and Reading Rooms.
Cleveland was founded in 1796.
Cleveland has 200 miles of Cable and Electric Ry.
Cleveland's Public Library has over 70,000 Volumes.
Cleveland has 2,500 Manufacturing Establishments.
Cleveland has One Ferrosteel Company.
Cleveland's Main Viaduct cost over $2,000,000.

THE OFFICES OF

The Ferrosteel Company,

WADE BUILDING,

THE WAREROOMS OF

The Ferrosteel Company,

17 and 19 LONG STREET,

CLEVELAND, OHIO.

FOUNDRY: **Chagrin Falls, Ohio.** (10 miles from Cleveland.)

SOLE MANUFACTURERS OF **"FERROSTEEL"**

RANGES! RANGES!! RANGES!!!

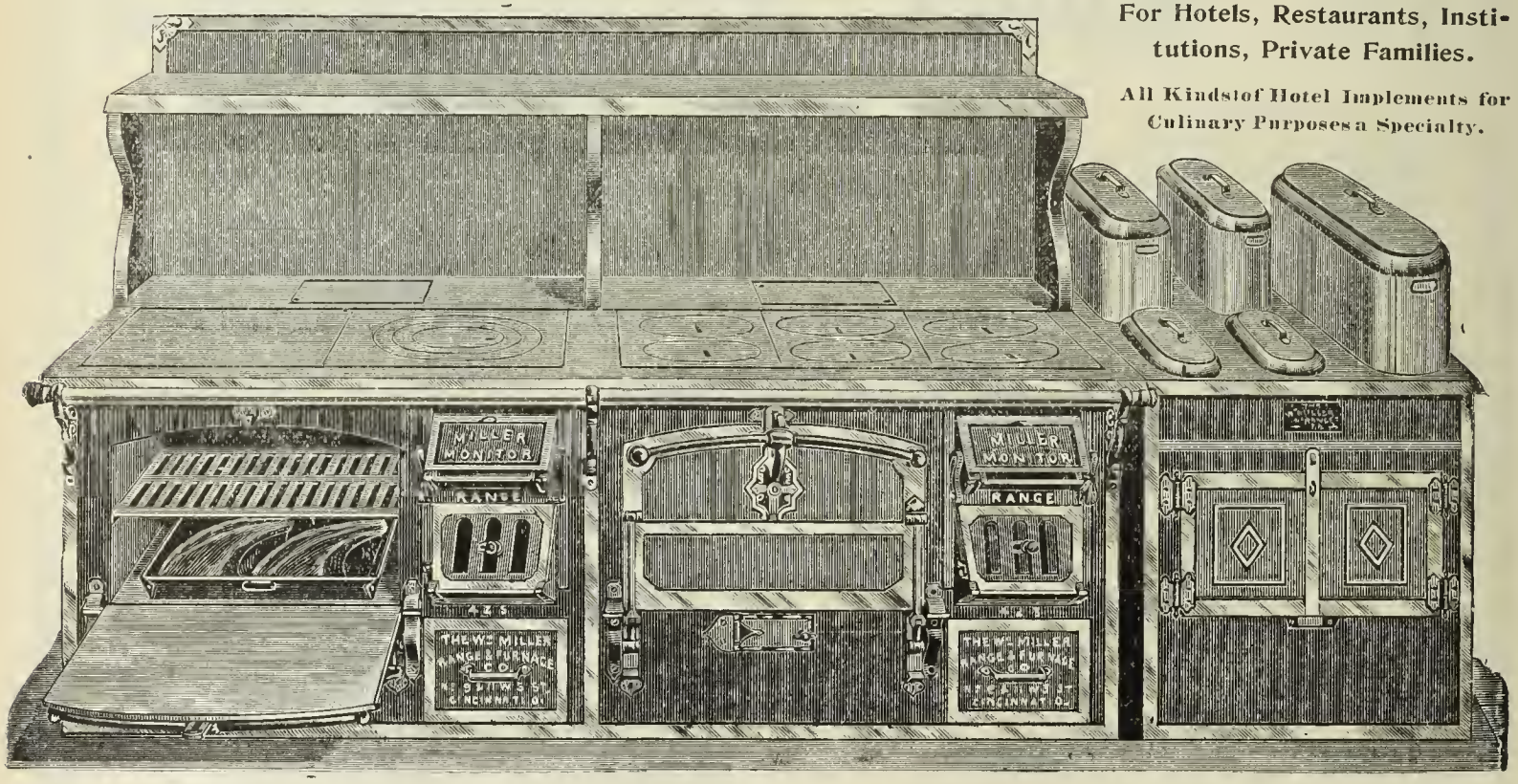
And HOT AIR REGISTERS.

HANDLE THE BEST. THE

Monitor Steel Ranges,

For Hotels, Restaurants, Institutions, Private Families.

All Kinds of Hotel Implements for Culinary Purposes a Specialty.



The Wm. Miller Range & Furnace Co.,

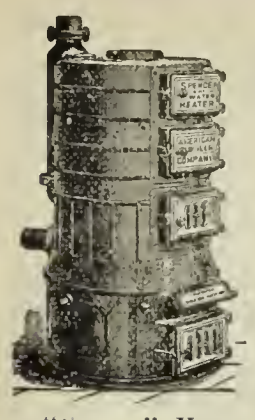
Nos 9 & 11 West 5th St.,
CINCINNATI, O.

AGENTS:

W. R. KENYON HDW. CO., Butte, Mont.
MILTON ROGERS & SONS, Omaha, Neb.
HOLLY, MASON, MARKS & CO., Spokane, Wash.
TACOMA STOVE CO., Tacoma, Wash.

THE JOHN SCHRAM CO., Seattle, Wash.
F. S. LANG & CO., Helena, Mont.
H. WETTER MFG. CO., Memphis, Tenn.

HOLBROOK, MERRILL & STETSON (for Pacific Coast), San Francisco, Cal.
Z. C. M. INSTITUTION, Salt Lake City, Ogden and Logan, Utah.



"Spence" Hot Water Heater.

WE EMPLOY nearly 1000 people in our various departments—all of them experts in their respective branches of work.

WE MANUFACTURE 18 styles and 182 sizes of Steam and Hot Water Heaters. They are constructed of the best materials obtainable.

WE SELL to the dealer only! It has always been an inviolable rule of this company not to sell to the consumer!

American Boiler Company

94 Centre St., New York. 84 Lake St., Chicago.

THATCHER

The Celebrated

"Thatcher"

FURNACE and RANGES.

GAS-TIGHT.
DURABLE.
ECONOMICAL.

Also Manufacturers of the

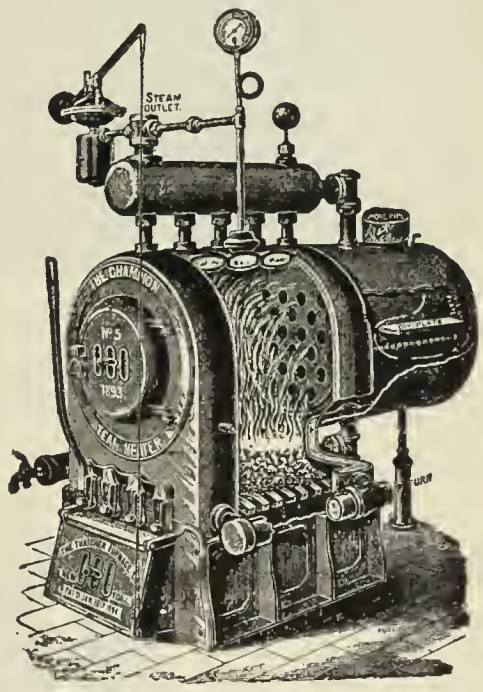
Sold by the trade extensively throughout the country.

Specified by Leading Architects.

Illustrated Catalogue Sent Free.

"CHAMPION"

Steam and Hot-Water Heaters.



Champion Steam Heater.

Has advantages over any other Heater.

Send for Circular.

The Thatcher Furnace Co.,

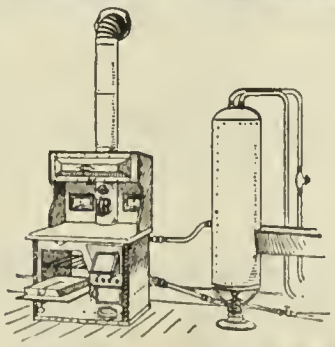
240 WATER ST., NEW YORK.

★ STAR WATER BACK AND BOILER ★

COUPLERS.

DONT WIPE YOUR JOINTS — SCREW 'EM TOGETHER

CONNECTS LEAD TO LEAD PIPE



CONNECTS LEAD TO IRON PIPE

NO SOLDER NO BURST — ANY MECHANIC CAN DO IT

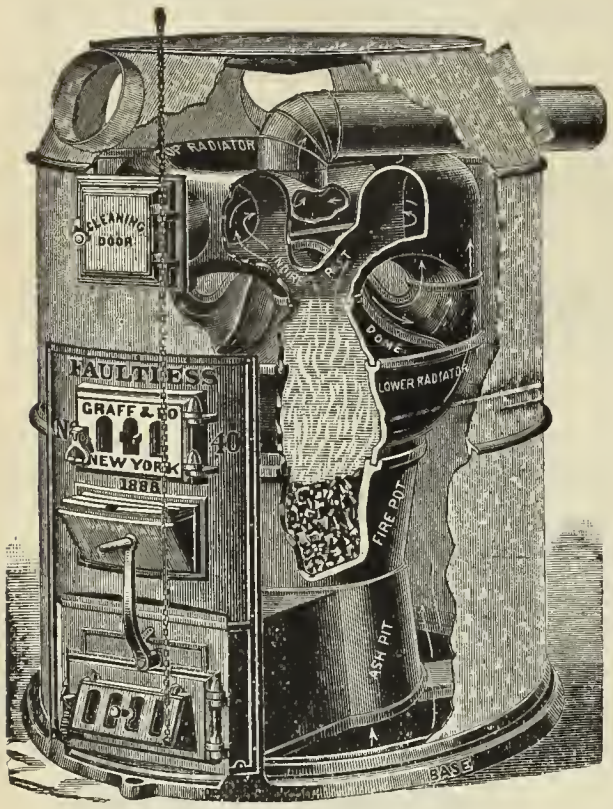
WRITE FOR NEW DESCRIPTIVE CATALOGUE PRICE-LIST.

STAR COUPLER CO., 801 Wainwright Bldg., St. Louis, Mo.

★ Chicago Engineer Supply Co., Chicago, Ills.
H. R. Hamilton, 67 Lake St., Chicago, Ills.
Omaha Stove Repair Co., Omaha, Neb.
E. Detrick, Jr., 19 Spear St., San Francisco, Cal.

Pittsburgh Supply Co., Pittsburgh, Pa.
Thomas Hoey, 141 Sumner St., E. Boston, Mass.
Northwestern Hdw. Co., St. Paul, Minn.
Garth & Co., 536 Craig St., Montreal, Canada. ★

FAULTLESS.



SUPERIOR GOODS.

FAULTLESS,
HERO,
HOT-BLAST
WARM AIR FURNACES.
HUMBER,
HARVARD,
YALE and SANDOW,
CAMBRIDGE
Hot Water and Steam Heaters.

Faultless, Elegant and Columbian Ranges.

GRAFF and COMPANY,

MANUFACTURERS, 208 Water Street, New York.

FREE

THE TRIUMPH - - FURN ACE ESTIMATE BOOK.

The Principles of Heating and Ventilation, with Facts and Figures.

The Triumph Picture Book.

THE DEALERS' BEST LINE.

The Triumph Special,
for hard coal. 5 sizes.

The Triumph all Cast,
hard or soft coal. 5 sizes.

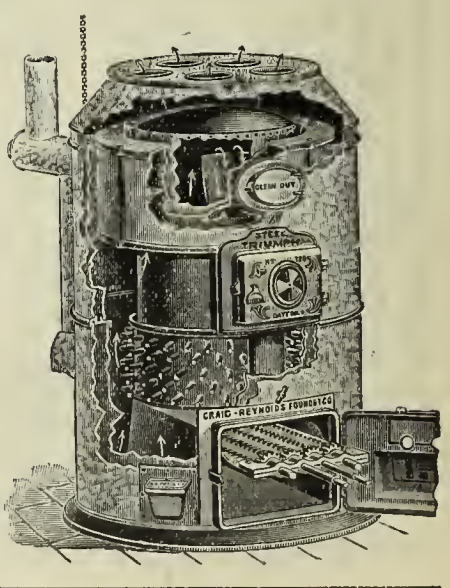
The Triumph King,
hard or soft coal. 4 sizes.

The Triumph Steel,
hard coal. 5 sizes.

The Triumph Air Blast,
soft coal. 5 sizes.

The Triumph Combination
for hot water and air. 5 sizes.

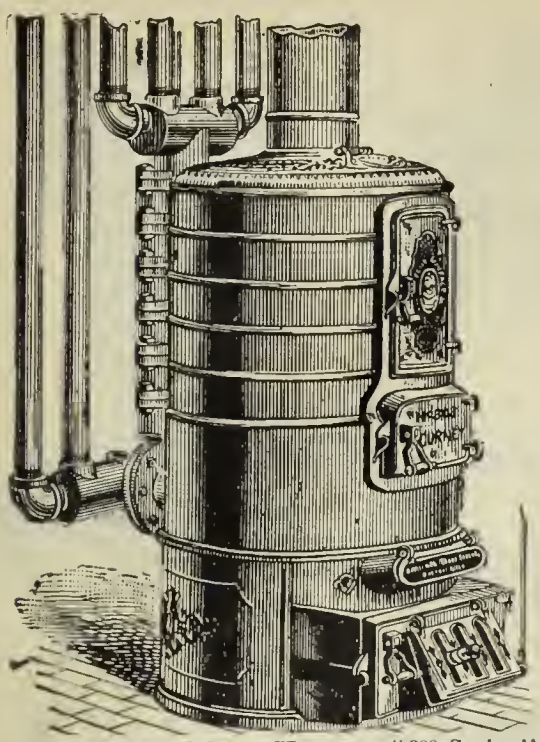
Every Dealer Ought to Have One.



1895 CATALOGUE OF THE TRIUMPH FURNACES.

The Craig-Reynolds F'd'y Co.,
DAYTON, OHIO.
WESTERN BRANCH:
GEO. D. HOFFMAN, Mgr.,
82 Lake St., Chicago, Ill.

Patent ***STEEL*** Ovens in 4 and 6 hole Helper Cast Ranges are made by the Chicago & Erie Stove Co. Catalogues showing profits to retailers mailed on application.



Gurney Hot Water Heater. "300 Series."

A GUARANTEE OF EXCELLENCE.

The Name Gurney

Used in connection with **Heating Apparatus** denotes **FINEST PRODUCTION.**

HOT WATER HEATERS, STEAM BOILERS, RADIATORS.

ALWAYS EQUAL TO THE OCCASION.

Send for Trade Catalogues.

SOLD ONLY TO THE TRADE.

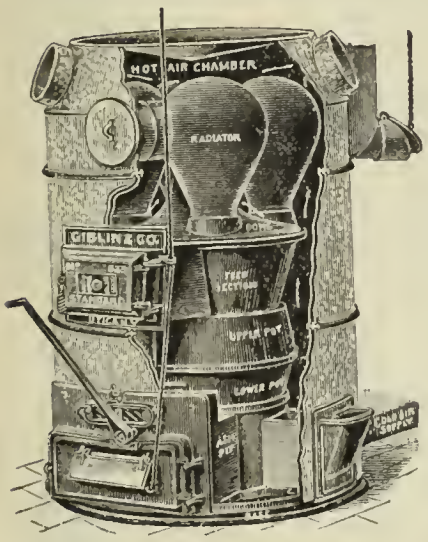
GURNEY HEATER MAN'F'G CO.,

163 Franklin St., Cor. Congress,

BOSTON, MASS.

What Will The Verdict Be

ON THE INCOME TAX QUESTION?



THE VERDICT OF THE PEOPLE

—REGARDING THE—

"STANDARD" FURNACE

HAS BEEN RENDERED. THEY HAVE DECIDED THAT

"IT IS THE BEST HEATER MADE."

IT HAS NO EQUAL FOR { Durability, Efficiency, Economy.

GET OUR NEW CATALOG.

GIBLIN & CO., Utica, N. Y.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

139, 141 and 143 CENTRE STREET, - - NEW YORK.

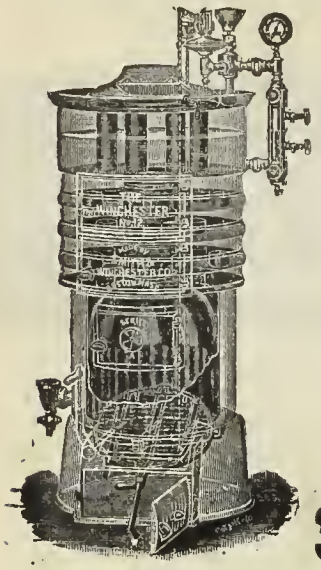
ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**



The Winchester



Has more ***COMMENDABLE***

And less ***OBJECTIONABLE FEATURES***

Than any Heater on the Market.

—MADE BY—

SMITH & WINCHESTER CO., Boston, Mass.

Our prices on these Heaters will please you. Send for them.

LARGEST ASSORTMENT OF STYLES AND SIZES IN THE MARKET.
CORRESPONDENCE SOLICITED.
CATALOGUES GIVE FULL DESCRIPTION.

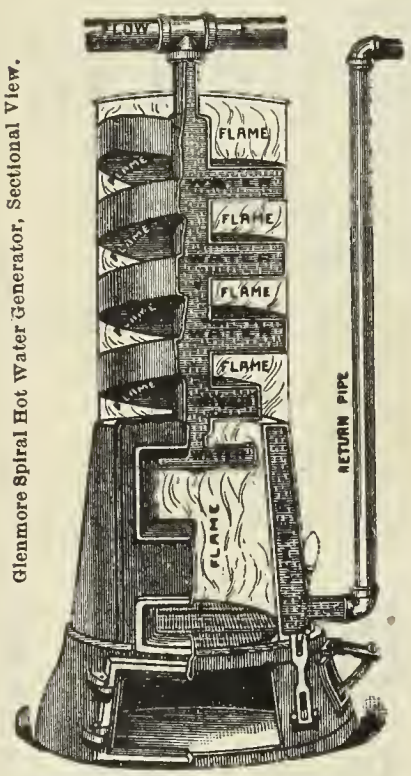
SOLD ON THEIR MERITS NOT ON THEIR ANTIQUITY.

Royal HEATERS

COMBINATION.

HOT WATER. STEAM. HOT AIR.

MANUFACTURED BY
HART & CROUSE.
UTICA, N.Y.
NEW YORK 211 WATER ST.
CHICAGO 79 LAKE ST.



Glenmore Spiral Hot Water Generator, Sectional View.

THE

GLENMORE

Spiral Hot Water Generator.

(PATENTED.)

For General Heating Purposes, but Especially Adapted to House Heating.

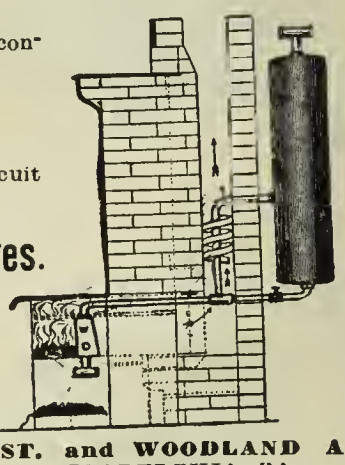
COMMENDATORY POINTS:

Simple construction. Practically composed of two sections, consequently few joluts and nothing to give out.
Large heating surfaces.
Products of combustion fully utilized.
Instantaneous generation of hot water.
Free and easy circulation.
Easily cleaned fire surfaces.
Hot water may be drawn off at any point along the pipe circuit without materially affecting the heating service.
Grate conducive to economy in fuel.

Spiral Water Back Attachment for Kitchen Ranges.

By utilizing waste heat, this water back extends the capacity of a kitchen boiler, and makes it a valuable heating auxiliary, especially in spring and fall, when the regular heating apparatus is too powerful.

☞Send for Pamphlet.



Spiral Water Back Attachment for Kitchen Ranges.

GLENMORE FOUNDRY AND MACHINE CO., 73d ST. and WOODLAND AVE. PHILADELPHIA, PA.

SECURE AGENCY EARLY.

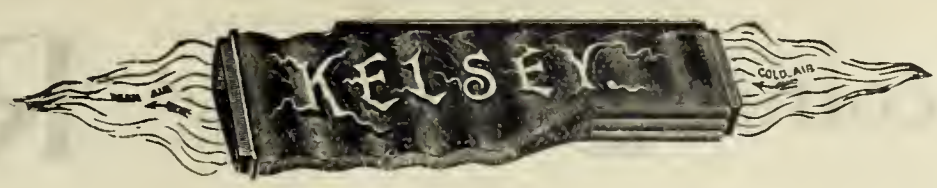
Send for Catalogue without delay.

The Plummer Steam Heater.

12th SEASON, BUT "UP TO DATE."

The Leader Hot Water Heater.

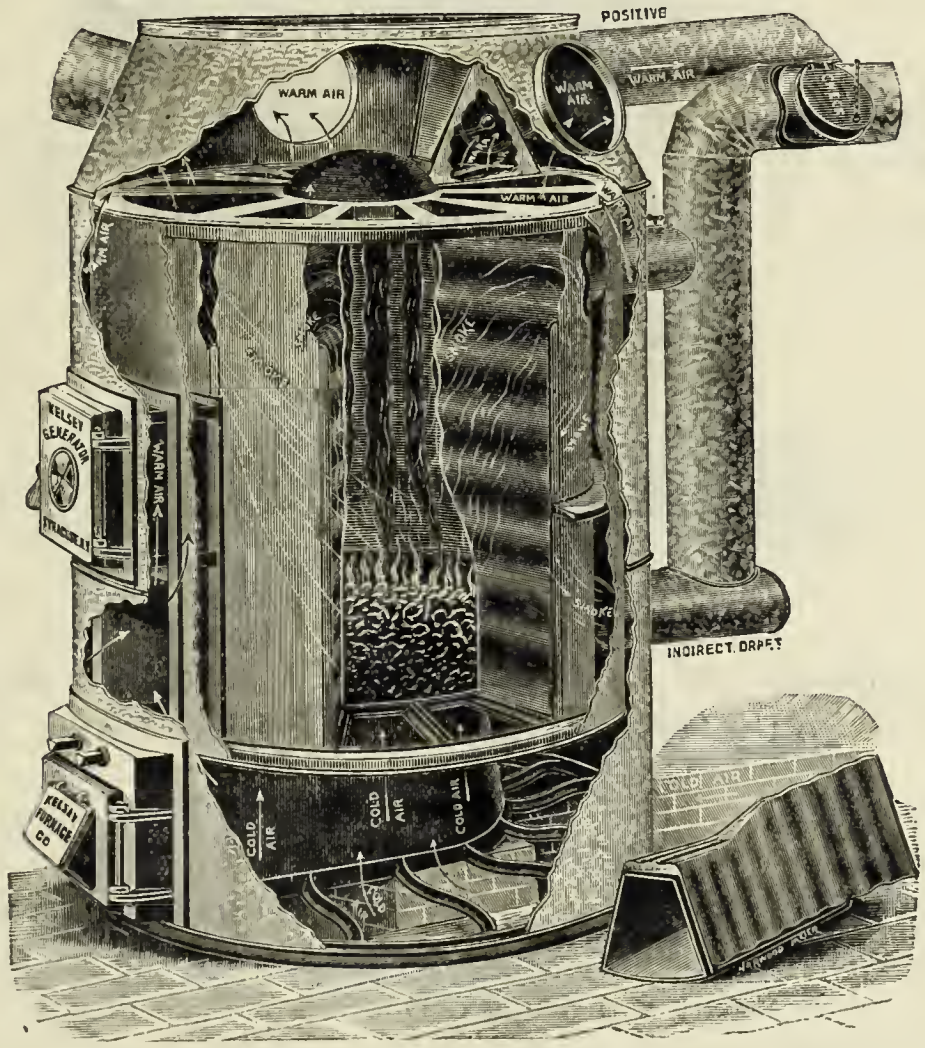
PUTNAM FOUNDRY & MACHINE CORPORATION, - PUTNAM, CONN.



WARM AIR

GENERATOR

Hot Water and Hot Air Combination.



Positive Circulation of Hot Air to Distant Rooms.

FIVE DIFFERENT SIZES.

Construction, Operation and Results Essentially Different from the Solid Fire-Pot Furnace.

Write for Catalogue of Full Particulars.

KELSEY FURNACE CO.,

SYRACUSE, N. Y.

113 Beekman Street, N. Y. City. 171 Lake Street, Chicago, Ill.

Welcome Stoves and Ranges.

KERNAN WELCOME RANGE.



Two Sizes, Portable or Brickset Nos. 7 and 8. Made with Oven either Right or Left of Fire Box.

WE HAVE embodied in this Range all that years of experience can suggest, both in ornamentation and construction. The design is unusually pleasing, with large Top Surface, large Fire Box and Oven. We furnish with Duplex, Dockash or Plain Flat Grates. Our Fire Box is so arranged that the grate pulls out through the front opening without disturbing the water back or brick, Those who have repaired old style ranges will appreciate this improvement. Sheet Flue of ample size. Guaranteed a quick baker and worker. Hot air for upper rooms is drawn from base and back of Range without interfering with the water back or Baking of Stove.

The Progressive dealers in Stoves and Ranges will find it wise to investigate and secure the sale of this modern Range. Write for Circulars and Prices.

—MANUFACTURED BY—

Syracuse .· Stove .· Works,

Syracuse, N. Y.

KERNAN

Warm Air Furnaces.

A Large Plant Devoted WHOLLY to

This Industry.

FURNACES

—OF ALL—

SIZES. STYLES. GRADES.

Light Weight.

Medium Weight.

Heavy Weight.

—ALSO—

Cast Iron Furnaces. **Steel Plate Furnaces.**

Soft Coal Furnaces.

Send for Catalogue. Secure the Agency.

Kernan Furnace Company,

CHICAGO, ILL. UTICA, N. Y.

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, etc., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

"It is a practical book. It does not contain rules that depend for their integrity upon one set of conditions, and which may not suit any other condition. The book is for the student and when studied it will be found surprising how much information it contains that may not appear by a superficial glance or hasty examination."—*Boston Journal of Commerce.*

The work is handsomely presented in a volume of 288 pages in the form of a handy reference book, with many illustrations, showing the several ideas and methods of heating, ventilation and economical arrangement of pipes and radiators, &c. The very complete specifications of materials which accompany several of the essays give a value to the work that will be understood and appreciated by the architect and builder who aim for excellence in this branch of house building."—*The National Builder.*

JAMES SQUIRE, *Youngstown, Ohio.*—"If we had only had the information contained in this volume in earlier life, we could now have dollars where we only have buttons."

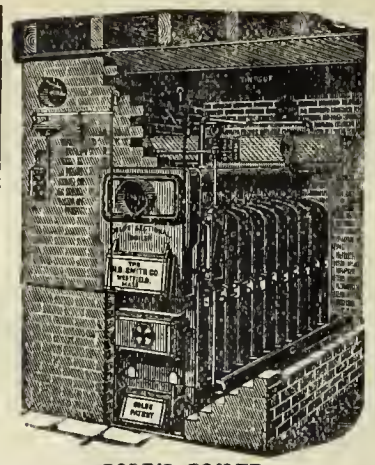
407 pages, 7 x 9½ inches. Handsomely bound in cloth. One volume.

PRICE, $3.00.

Sent post-paid on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade St., New York.



GOLD'S BOILER

THE H. B. SMITH CO.,

MANUFACTURERS OF

Steam and Water

Heating Apparatus

FOR

PUBLIC BUILDINGS AND PRIVATE RESIDENCES

SPECIALTIES:

Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
Reed's Improved Cast-Iron Radiators,
Gold's Indirect Pin Radiators,
Breckenridge's Patent Automatic Air Valves.
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for hard or soft coal.

Office & Warerooms, 137 Centre Street, New York.

FOUNDRY, WESTFIELD, MASS.

Catalogues Sent on Application.

STEAM
HOT WATER
WARM AIR
FOR HEATING ALL CLASSES OF BUILDINGS

CAPITOL HEATERS

OUR LITTLE BOOK
"WARMTH FOR WINTER HOMES"
TREATING OF HEATING, RADIATION, VENTILATION ETC
IS INTERESTING AND INSTRUCTIVE
WE SEND IT FREE

UNITED STATES HEATER CO.

113 RANDOLPH ST. DETROIT, MICH

CHICAGO — NEW-YORK — BOSTON.

THAT'S WHAT THEY SAID—

"Cold snap? We hadn't noticed it particularly—kept warm enough at our house"

THEY WERE USERS OF THE

"Mowry-Page" Boiler,

This well satisfied lot of people. Many fitters were fortunate enough to have them among their customers—were **YOU?** Our new agency list is open for '95–'96: shall we put your name at the head of it? Experience must have shown you that it pays to please your trade, and we can help you do it.

Better have our catalogue by you anyway—it's a good investment and costs you nothing.

W. C. MOWRY, Lock Box 314, Norwich, Ct.



THE MAHONY BOILERS.

For Steam or Hot Water.

THOUSANDS IN USE

And all Giving Satisfaction.

SEND FOR CATALOGUE.

M. MAHONY, - Troy, N. Y.

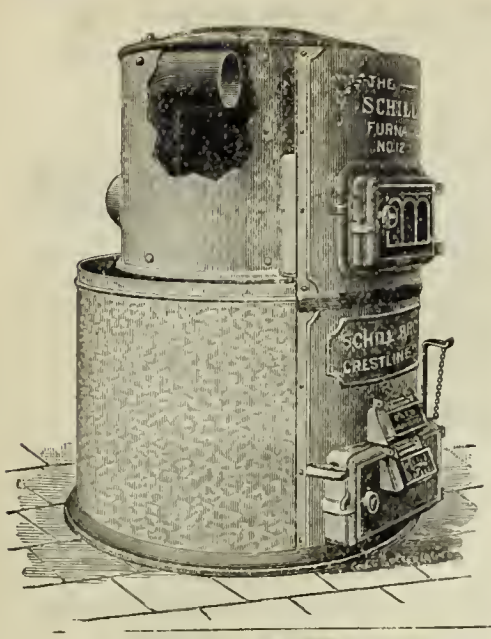
ORIGINAL

"BEAUTY OIL STOVES."

Central Draft, Double Roller Burners.

TROY OIL STOVE CO., - - Troy, N. Y.

AGENTS: Reeves & Smiley, Philadelphia, Pa. C. T. Corly, Brooklyn N. Y.



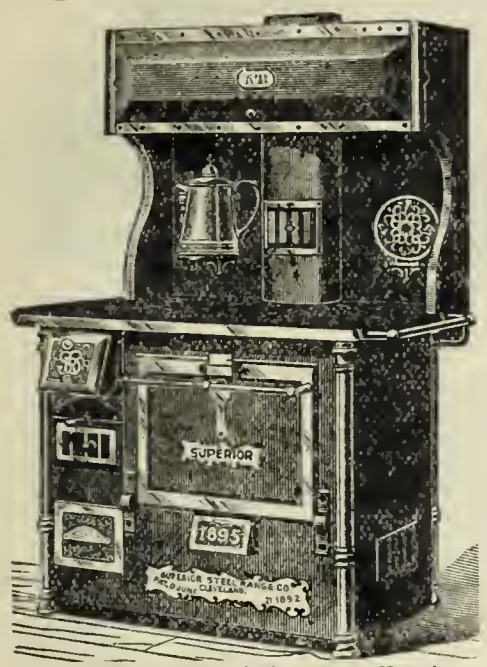
Schill's New Idea.

You've heard about it, but have you seen it? Let us know your address and we'll put you on to some one in your vicinity who has had one in use the past winter. They'll tell you all about it. That shows the confidence we have in our heater, doesn't it? Write

SCHILL BROS., - Crestline. O.

DAVIS, JOHNSON & CO., Chicago.

UNION IRON WKS. MFG. CO., Denver, Col.



The Greatest Fuel Saver on Earth.

Do you want to sell the best working and best finished STEEL RANGE on the market?

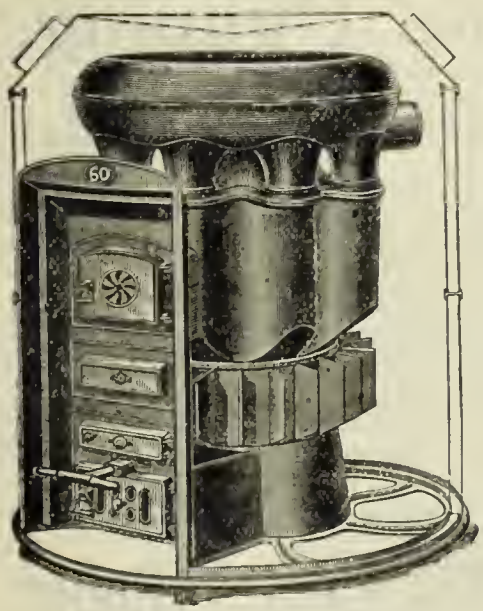
If you do let us send you description of THE SUPERIOR and MARQUART RANGES.

We are now in our new factory and can fill all orders promptly.

SUPERIOR STEEL RANGE CO.,

131-137 Viaduct and 35 W. Center,

CLEVELAND, O.



CORY'S

ALL CAST IRON

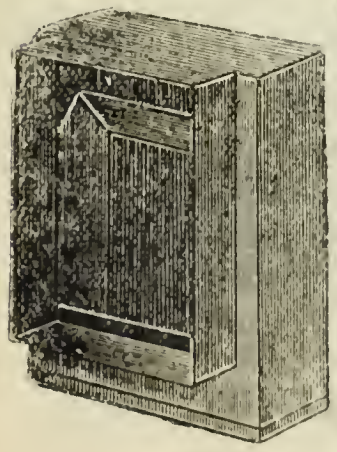
GAS-TIGHT FURNACES.

The purchaser will never ask if this is the *best* quality made, as all dealers understand the "Cory Furnace" to be only of *cast iron*, without bolted joints; gas-tight and durable. Quality exactly the same in twenty sizes from $35 to $125.

UZAL CORY & CO.,

210 Water St., New York.

Estab'lished 1847



Novelty Ventilated Wall Pipe,

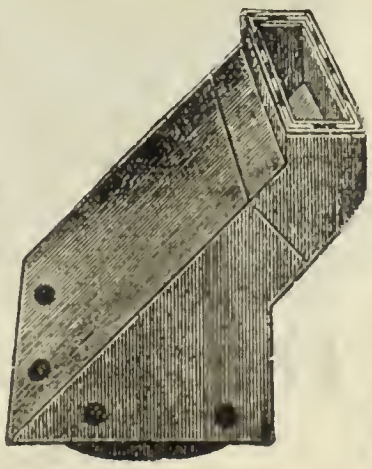
Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

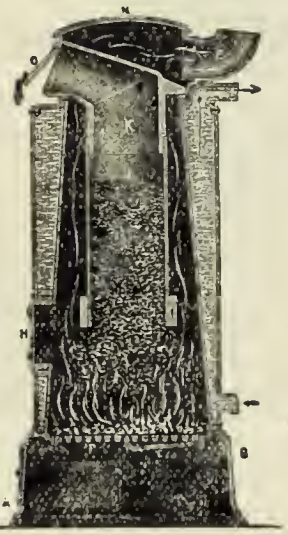
JOHN P. SCHAFFER,

18 Wood Street, Pittsburgh, Pa.



"Tabasco" WATER HEATERS.

All Steel Self Feeder.



FOR

GREENHOUSES,
FLATS
LAUNDRIES,
CHURCHES,
BAPTISTRIES,
HOTELS,
BATH HOUSES
HOSPITALS,
RESIDENCES.

Kewanee Boiler Co.,

96 E. Lake St., CHICAGO. } KEWANEE, ILL.



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showroom, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.



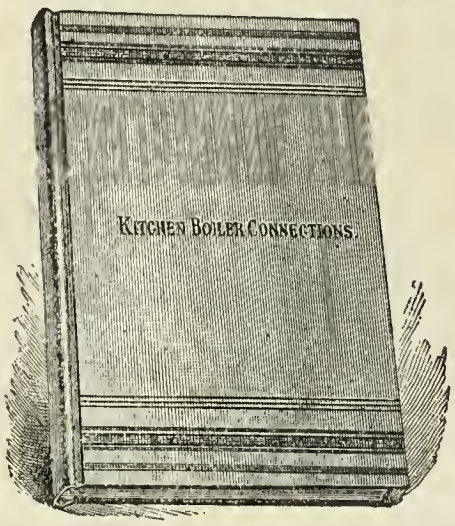
— SHE: "No, George, I like you, but I can never be your wife."

He (haughtily): "Never mind. There are others."

She: "I know there are, George. I accepted one of them this morning."—*Cleveland World.*

SECOND EDITION.

KITCHEN BOILER CONNECTIONS.



A SELECTION OF

Practical Letters and Articles Relating to Water Backs and Range Boilers.

Compiled from THE METAL WORKER

71 Illustrations, 8vo, 140 Pages, Cloth

Price, $1.00

The book is well got up and the information well given. Those interested in works of this character will do well in buying it.—*The Plumber and Decorator.*

The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

The publisher of this work is well known for his former successful efforts in the publication of useful and thoroughly practical books for metal workers and steam fitters The book before us is a model of its kind in judicious compilation, practical instruction, neat illustrations and general typographical appearance.—*The Master Steam Fitter.*

Can be considered an authority on the subject to which it relates.—*American Engineering.*

The book is a practical helper to every member of the plumbing trade, who, being alive to his own interests, should embrace this opportunity to obtain the valuable instruction in which the work abounds.—*New England Stove, Hardware and House Furnisher.*

A well bound, well printed, well illustrated and well edited book. . . The special field of this work is very thoroughly covered. . . Abounding in rare technical information of a practical character. *American Artisan.*

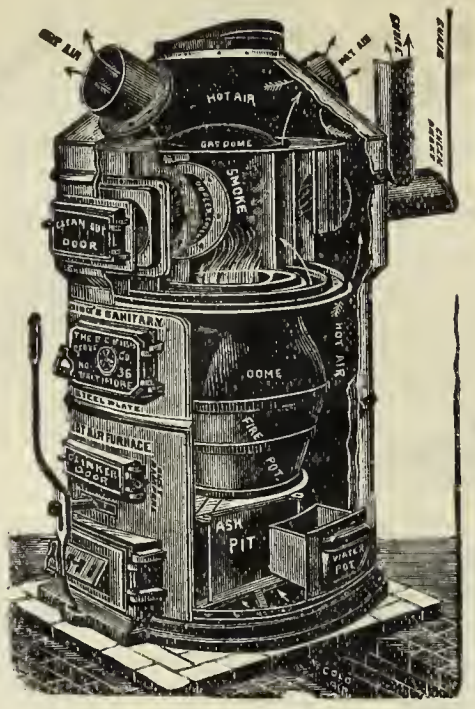
Nearly every problem is illustrated fully and this interesting question of water back connections will be found to be quite fully treated in the volume.—*Domestic Engineering.*

Both interesting and instructive to our trade. It shows how mistakes are apt to arise and how they may be overcome.—*Plumbers' Trade Journal.*

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

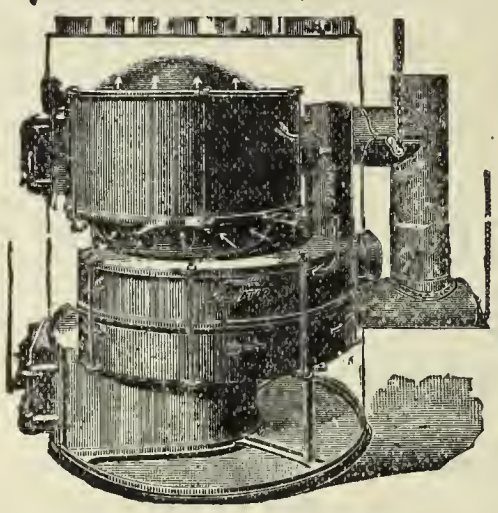
BIBB'S ORIGINAL

Baltimore Fire Place Heaters,

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW WARE, &c.

Send for Catalogue with Testimonials.

VICTOR WARM AIR FURNACE.



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.

DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

IT IS A GREAT ECONOMIZER OF FUEL.

IT IS A LOW FURNACE.

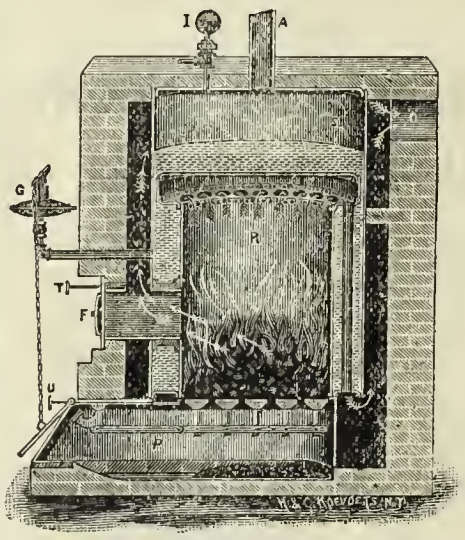
Schraalenburgh, N. J., Feb. 21, 1895.

GENTLEMEN: In reply to your question—how are you pleased with the Victor Furnaces? I think the fact that I have one in my house here, and one in my house at Corning, and have placed six others in buildings constructed by me during the past two years, and from my personal knowledge these Furnaces are giving excellent satisfaction as to their Heating Capacity, is the best evidence I can give that I am pleased with the Victors; they are most economical in the consumption of Coal.

Yours respectfully,
O. G. RUSSELL.

Agents wanted. Address

THE CORNING MANUFACTURING CO.,
Corning, N. Y.



The Dunning.

For

Steam or Hot Water Heating.

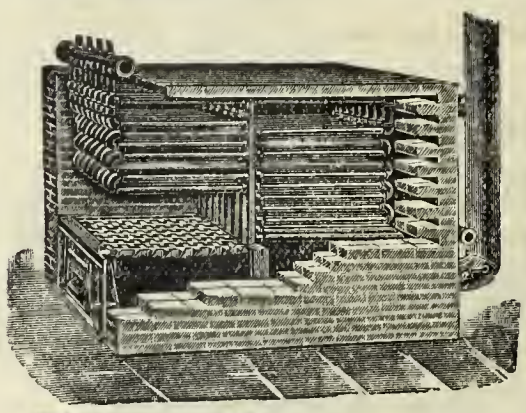
DO NOT BUY

Until you get our New Catalogue and Prices

We have something to offer you for 1895.

NEW YORK CENTRAL IRON WORKS CO.,

71 Exchange St., Geneva, N. Y.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

Over 300 Different Sizes.

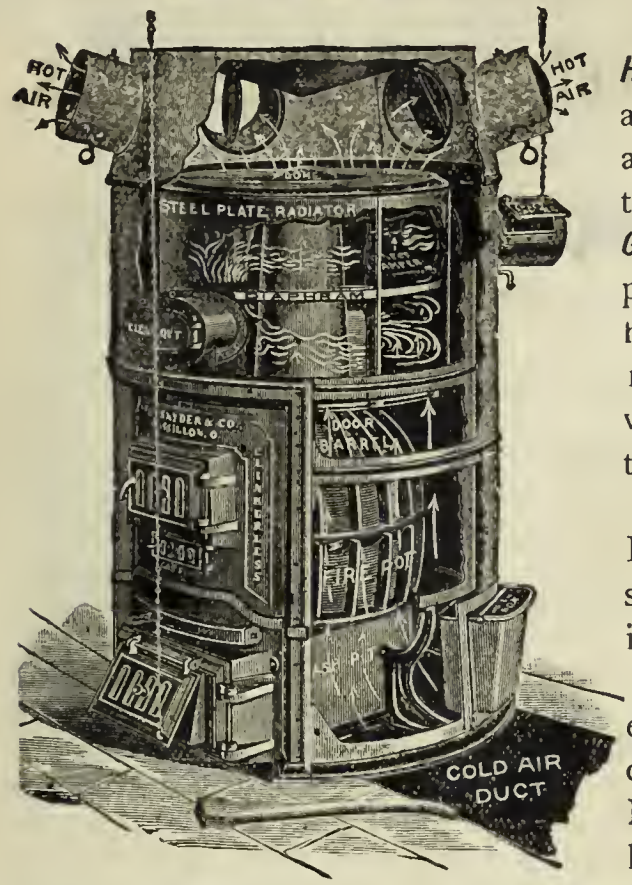
SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
5, 17, 19 ACHILLES ST., ROCHESTER, N. Y.

New York Office, 44 Dey Street.

A BOOMER and SURE DEATH.



THE BOOMER HOT AIR DRAFT is absolutely correct and will *burn* all the *Smoke* and *Gases*. The draft passes through a heated iron chute 1 in. high, 15 in. wide and 6 in. long to reach the fire.

Double Return Flue Radiator insures *Economy* and is easily cleaned.

Especially adapted for either *Soft* or *Hard Coal*. Makes fully one-half less ashes than any other furnace. All Soot is burned. *Heaviest, Most Durable* and *Economical* Furnace made. "Don't be a clam," but investigate and learn the *Real Merits* of the *Boomer* before you order Furnaces.

The No. 16 Novelty Spray Pump

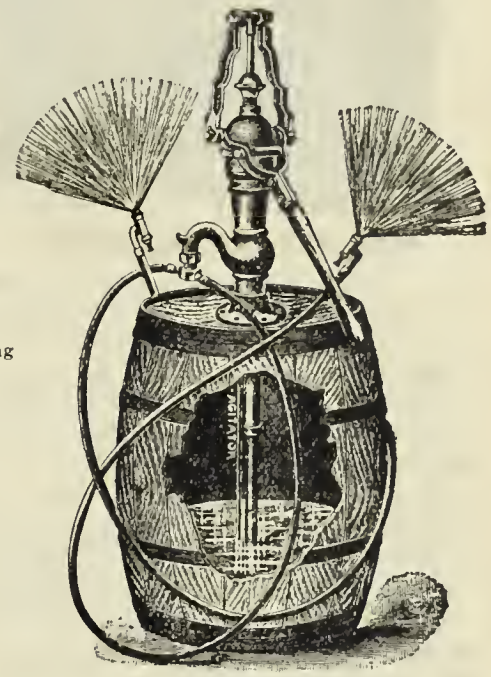
Is a Fatal Enemy to Bugs and Insects.

A perfectly steady stream is obtained, full 6½ inch stroke. Agitator pipe to bottom of tank insures constant stirring up of the solution being used. Life is too short to waste words selling a poor pump.

The Novelty will save you time and trouble and make a good profit for you.

The Only Perfect SPRAY PUMP Made.

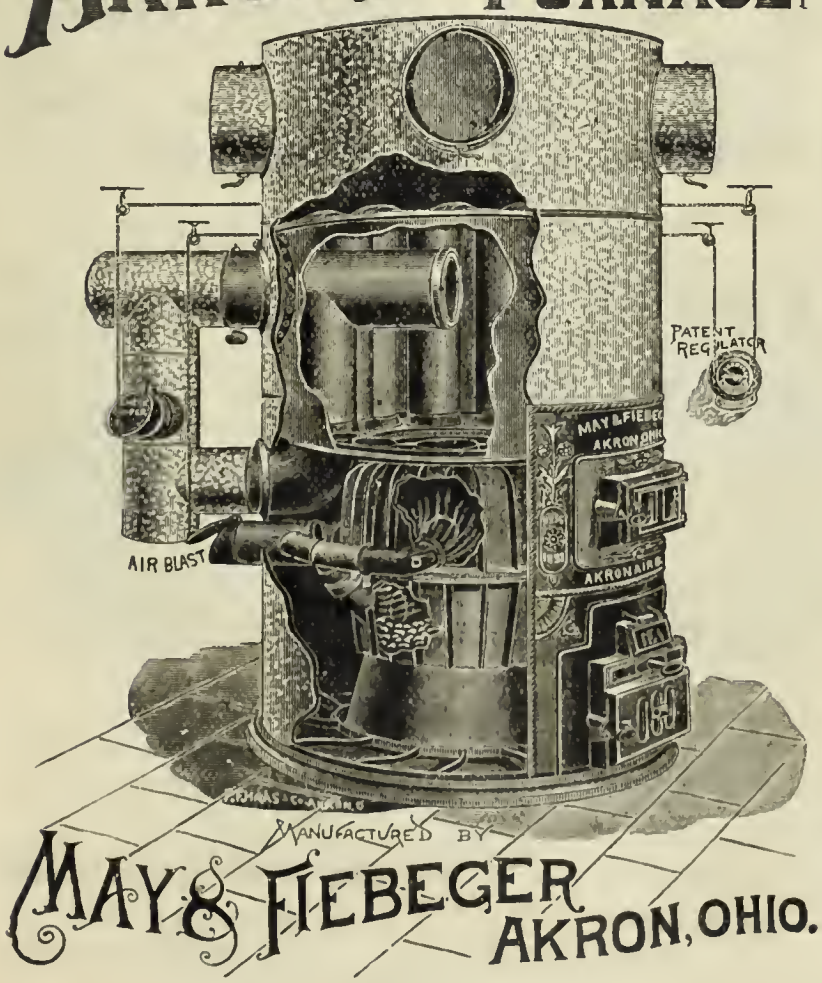
Write for Complete Catalogue of its Many Merits and Illustrating Full Line of Other Spray and Well Pumps.



HESS, SNYDER & CO., Sole Makers, 73 ERIE ST., MASSILLON, O.

"Nothing Succeeds Like Success."

AKRON AIR BLAST FURNACE.



MAY & FIEBEGER AKRON, OHIO.

—THAT—

"THE AKRON AIR BLAST FURNACE

Has no equal as a Hot Air Furnace for

HARD OR SOFT COAL,"

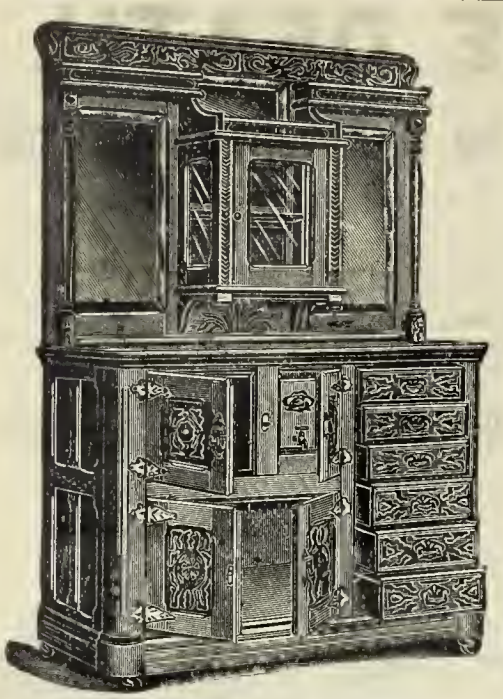
Is the verdict of thousands of dealers and purchasers.

SEND FOR CATALOGUE

Increase your trade by securing the agency of

THE FURNACE

That has revolutionized the furnace trade.



GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co , Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.
Lee-Clarke-Andreesen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Wm. Miller Range & Furnace Co., Cincinnati, O.
Doggett Dry Goods Co., Kansas City, Mo.

BUY THE BEST.

—THE—

Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,

GRAND HAVEN, MICH., U. S. A.

Write for our large Illustrated Catalogue for 1895.

All our goods are made of thoroughly kiln dried ash, finished in antique with Shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups All Refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

THE CHALLENGE ICEBERG,

THE .·. HONEST .·. RELIABLE .·. REFRIGERATORS.

SELL THE BEST.

THE SHIRK REFRIGERATOR CO.,

CORK FILLED.

Manufacturers of

REFRIGERATORS

FOR

Families,

Hotels,

Restaurants

AND

Apartment Houses.

THE SHIRK REFRIGERATOR CO. TRADE MARK

Builders of

Cold Storage Houses

AND

COOLING ROOMS

Of Every Description.

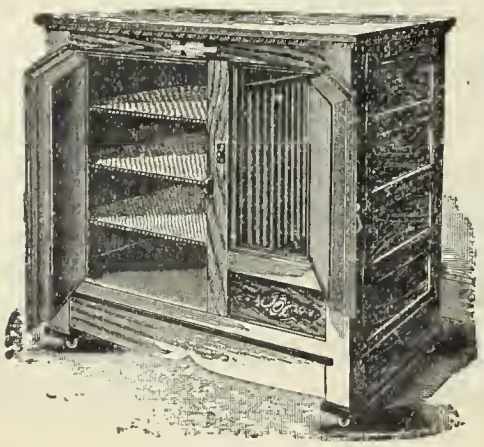
273 WABASH AVENUE,

CHICAGO.

Branches { 30 Warren Street, NEW YORK. / 905 Market Street, PHILADELPHIA.

The Automatic Refrigerator

has more good points and does better work than any other and for that reason is a better seller. Our illustrated catalogue for 1895 te ls all about the line. Its advantages are:

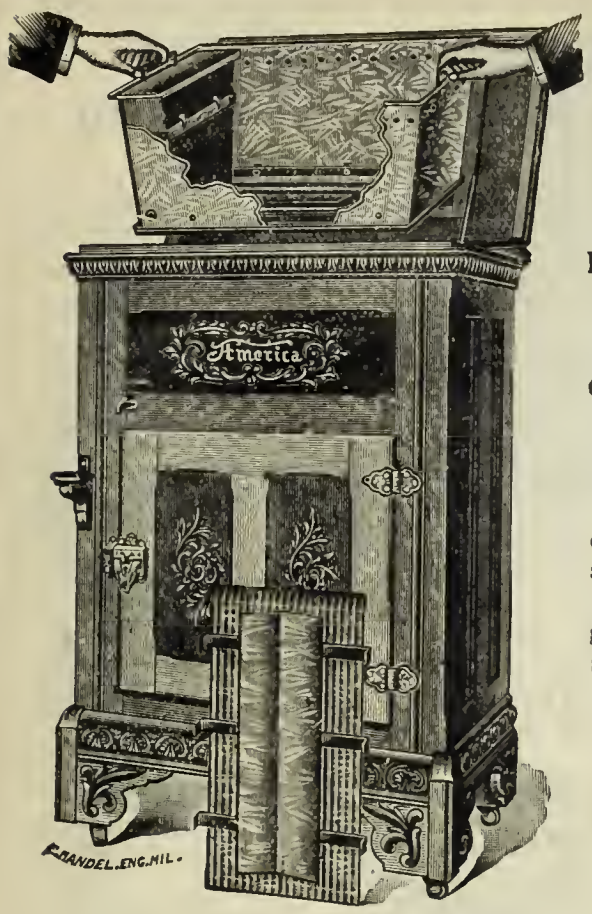


Perfect circulation.
Large condensing and purifying capacity.
It has no flues to cause it to smell bad.
The trap is inside where it cannot be misplaced or lost.
The drip pipe may be cleaned without disturbing anything in either chamber, and is entirely out of the way.
It has nine walls to protect the ice and to maintain a uniform temperature in the cooling chamber.
It has woven wire provision shelves that are superior.
It has superior hardware.
It is more capacious and convenient.
Flavors of foods will not mix.
Last but not least, it's different, and will bring new customers and new trade.

We want the leading dealers to sell our goods and but one dealer in a place.
The goods are made of ash, and well finished.
We have two factories, one in the East and one in the West, and are able to take better care of your trade than if we had but one.
For catalogue and discount address:

Illinois Refrigerator Co.,
909 Masonic Temple,
Chicago.
If West of Chicago.

Columbia Refrigerator Co.,
Northville,
Wayne Co., Mich.
If East of Chicago.



The America!

GEM OF

REFRIGERATORS.

Patented Removable
Ice Compartment.

Can be kept clean with the least trouble.

Its construction for cleanliness, drainage of waste water, circulation and insulation is perfect.

Write for catalogue and investigate our claims. It will pay you to secure the agency in your town.

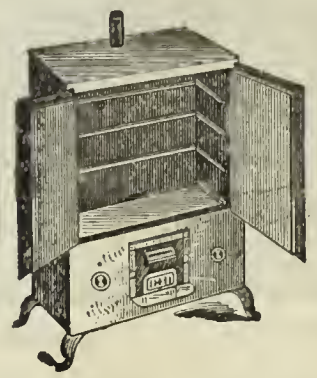
THE

Bowen Manufacturing Co.,

FOND DU LAC, WIS.

BLODGETT'S PATENT PORTABLE OVEN

—FOR—



Hotels, Steamships, Confectioners, Japanning, Core Baking, Public Institutions, &c.

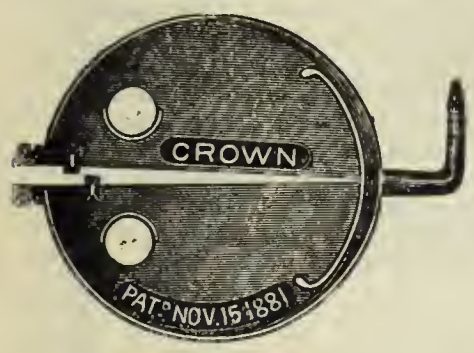
BAKING BY

Perfect Circulation of Hot Air.

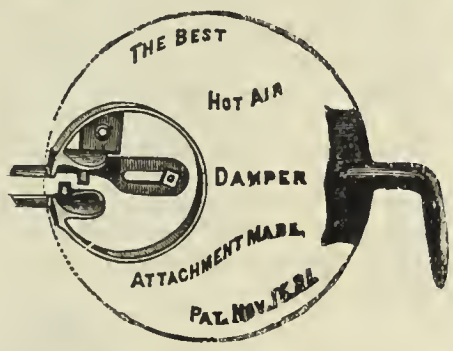
10 SIZES. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.
Burlington, Vt.

Crown Damper and Crown Damper Attachment.



NICKEL PLATED HANDLE.



PUT UP 1 DOZ. IN A BOX.

—MADE BY—

W. F. GREENE, TROY, N. Y.

D. MOORE CO., Limited, Hamilton Ontario, Sole Makers for Canada

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE

THE BEST IN THE WORLD!

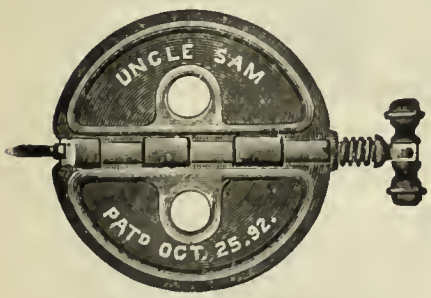
OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

At LOWEST PRICES EVER KNOWN.

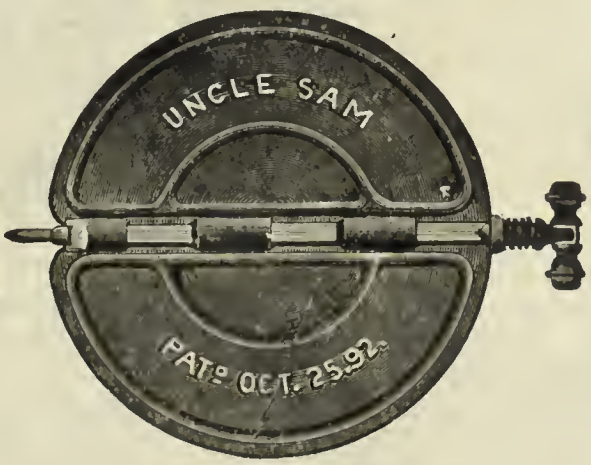
If your dealer does not have them, Send for Illustrated Circular and Price-List, to

JOS. W. WAYNE,
MANUFACTURER,
124 MAIN STREET, CINCINNATI, O.

Uncle Sam Dampers.



Smoke Pipe Damper.



Heater Pipe Damper.

Steel Plates, Malleable Iron Pointed Stems, Permanent Springs, Enameled Wood Handle.

THE DIFFERENCE IN WEIGHT PAYS THE FREIGHT.

Sole Manufacturers, **Sayre Stamping Co., Sayre, Pa.** For Sale by the Jobbers

Gray Iron Castings,

Cheap Heating Stoves,
Diamond Thimbles.

S. CHENEY & SON,

MANLIUS, N. Y.



SOMETHING NEW.

The Little Giant Steel Truck. Strong, Light.

ENTIRELY OF

METAL AND AT A VERY LOW PRICE.

Write for Circulars and Prices to the Manufacturers,

THE G. L. VAN NAMEE MFG. CO.,

Gouverneur, N. Y., U. S. A.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to

The Mica Mfg. Co.
JOHN O'NEILL, Prop.,
83 Fulton St. N. Y.

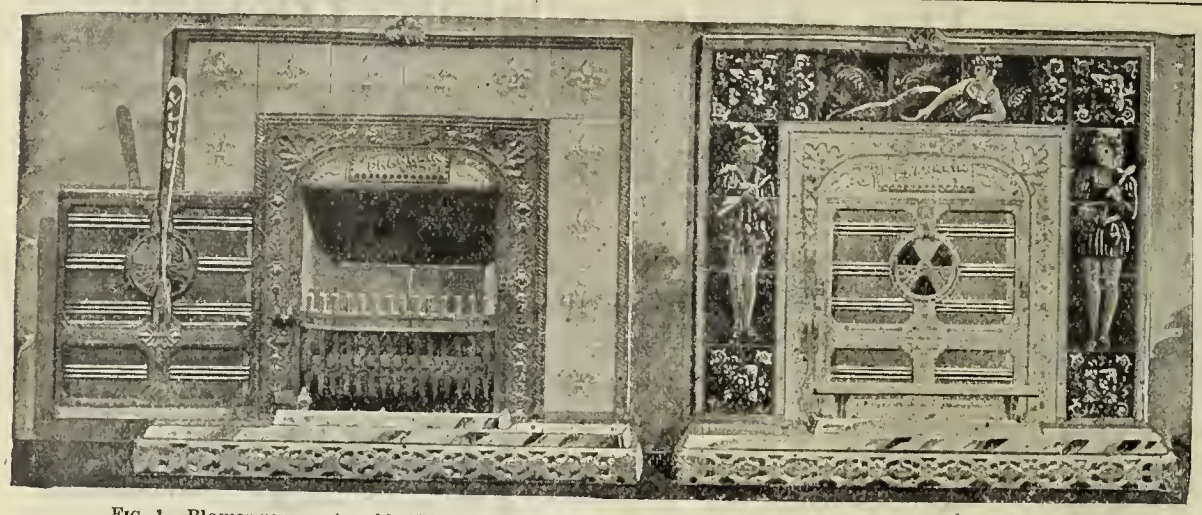


FIG. 1.—Blower removed and held in position on hearth of grate instead of on floor.

FIG. 2.—Grate closed with blower at night assuring safety from fire. Fire kept in all night.

THE Art Franklin Grate.

A VERY handsome and powerful heater and ventilator for dwellings.

Burns Hard or Soft Coal, Natural Gas or Wood.

Also arranged to heat upper rooms in addition.

OSCILLATING GRATE BARS. Shaker removes blower thus insuring protection to fingers.

Fire raked with blower in position, consequently the grate is absolutely gas and dust tight.

Perfect control of draft.

SIZE OF FIRE BOX: Front, 16 in., Depth, 12 in., Height, 10 in.

Size of Chimney Openings: WIDTH—Not less than 23 or more than 32 inches. HEIGHT—Not less than 28 or more than 32 inches. DEPTH—(Front to rear) not less than 14 inches.

THE MARCH-BROWNBACK STOVE CO., Pottstown, Pa.

Some Curious Trees.

There are many vegetable wonders in this world of ours. Certain tropical trees furnish clothes as well as food, and the inner bark of others is smooth and flexible enough for writing paper. The bread tree has a solid fruit, a little larger than a cocoanut, which, when cut in slices and cooked, can scarcely be distinguished from excellent bread. The weeping tree of the Canary Islands is wet, even in a drought constantly distilling water in its leaves, and the wine tree of Mauritius Islands furnishes good wine instead of water. A kind of ash in Sicily has a sap which hardens into sugar, and is used as such by the natives without any refining. The product of the wax tree in the Andes resembles beeswax very closely. Then there is the butter tree of Africa, which produces as much as a hundred pounds at once, only to be renewed in a few months. This secretion, when hardened and salted, is difficult to distinguish from fresh, sweet butter. Closely rivaling this is the milk tree of South America, the sap of which resembles rich cow's milk, and is used as such by the natives. China can boast of a soap tree, the seeds of which, when used as soap, produce strong suds and remove dirt and grease readily. In direct opposition to the useful trees is the man eating plant of the tropics, which resembles Venus' fly trap in its nature. It has a short, thick trunk armed with narrow, flexible, barbed spines.—*Exchange.*

—A SMART WOMAN.—The lady from the back tier of counties was making her first visit in Washington, where all social business is conducted on strict rules, and one day she happened on a card of a Washington woman who lives in one of the largest houses in the town. In one corner of the card was the word "Thursdays," and she did't quite understand it.

"What is the 'Thursdays' for?" she asked the landlady of her boarding place.

"Oh, that means she is at home only on Thursdays," explained the landlady.

"My, my," exclaimed the visitor, "she must be a dreadful smart woman to be able to keep that great big house in any kind of decent order and only stay at home one day in the week. I don't go away at all, hardly, and mine ain't anything like so big as hers, but it don't give me a minute's rest trying to keep it clean and tidy."—*Detroit Free Press.*

—GENTLEMAN: "How came you to put your hand in my pocket?"

Pickpocket: "Beg your pardon. I am absent minded. I had once a pair of pants just like those you are wearing."—*National Standard.*

ART OF COPPERSMITHING.

A PRACTICAL TREATISE ON WORKING SHEET COPPER INTO ALL FORMS.

By JOHN FULLER, Sr.

Size, 10 x 6½ inches; 327 pages; 474 engravings. **Price, $3.00.**

THIS book is brought out to meet the needs of a body of sheet metal workers whose trade has never before been thoroughly described. The author has acquired proficiency in copper working through a long apprenticeship and many years of actual labor at the bench. The instruction he gives is, therefore, entirely practical and will be correspondingly valued by those who are in any way interested in coppersmithing. A special feature of the work is the illustrations, of which there are 474, and which add much not only to the interest but the value of the text, as they show the work in all stages of progress and illustrate all the appliances, patterns and tools. The work is divided into sections, each treating a separate topic, and is thoroughly indexed. The style of the writing is exceedingly simple, and the descriptions of work go into the smallest details.



Fig. 107.—Planishing Tea-Kettle Side.

CONTENTS:

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Saucepans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

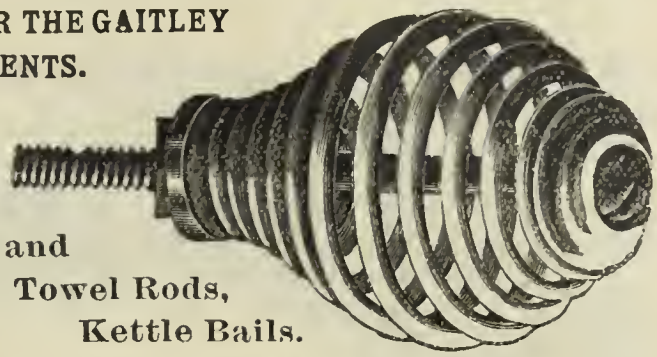
Sent, Post-paid, on Receipt of Price by

DAVID WILLIAMS, Publisher,

96-102 READE STREET NEW YORK.



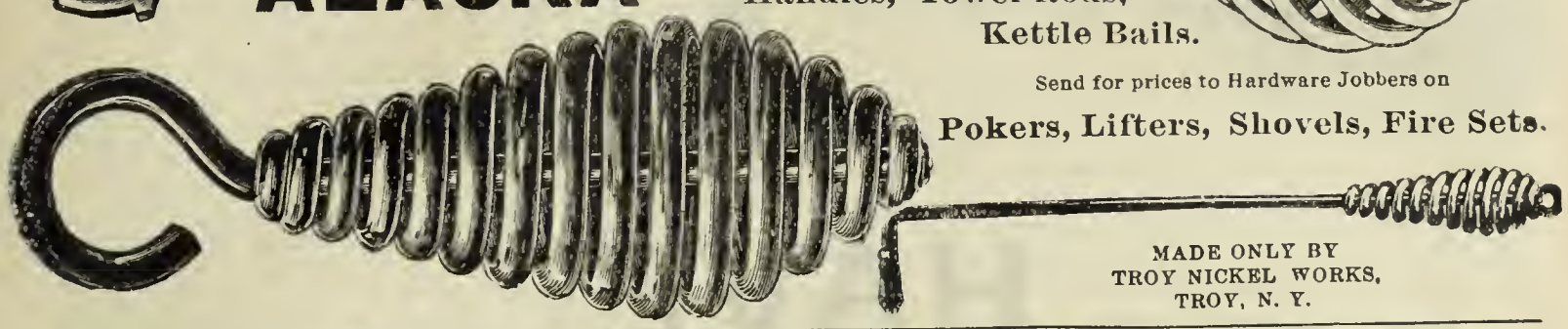
MADE UNDER THE GAITLEY PATENTS.



ALASKA Stove Knobs and Handles, Towel Rods, Kettle Bails.

Send for prices to Hardware Jobbers on

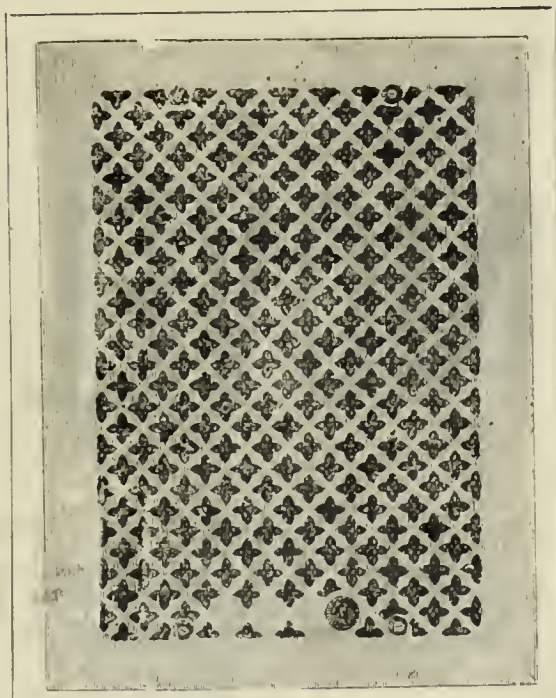
Pokers, Lifters, Shovels, Fire Sets.



MADE ONLY BY
TROY NICKEL WORKS,
TROY, N. Y.

TUTTLE & BAILEY MFG. CO.,

REGISTERS, VENTILATORS, &c.



ASYLUM OR LOCK REGISTER.

REGISTERS, VENTILATORS, &c.

New York, Chicago and Boston.

MICA

NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

MICA

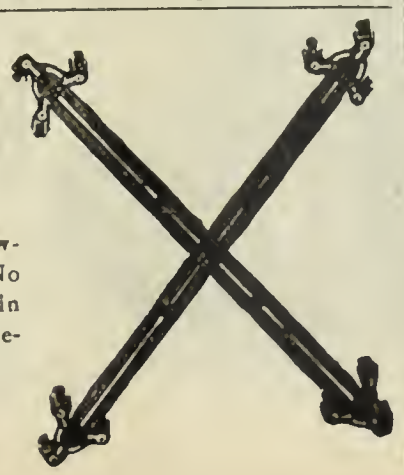
MICA OF ALL GRADES
—FOR—
STOVES and Mechanical Purposes.
PALERMO MICA CO.,
Miners and Importers and Wholesale Dealers.
S. T. PECKHAM, Sales Mgr. 27 Peck Slip, New York.



THE Eclipse Adjustable Stove Truck. The newest, neatest, lightest, strongest and best. No side strain or tilting. Bearing always directly in center. All steel and malleable iron. Lasts a lifetime. Price, $18.00 dozen.

MANUFACTURED BY

STELLWAGEN & KYNOCH, St. Ignace, Mich.





Warm-Air Registers, Ventilators Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, - Buffalo, N. Y.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers, Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.

NEW HAMPSHIRE

MICA

IS THE BEST.

The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.

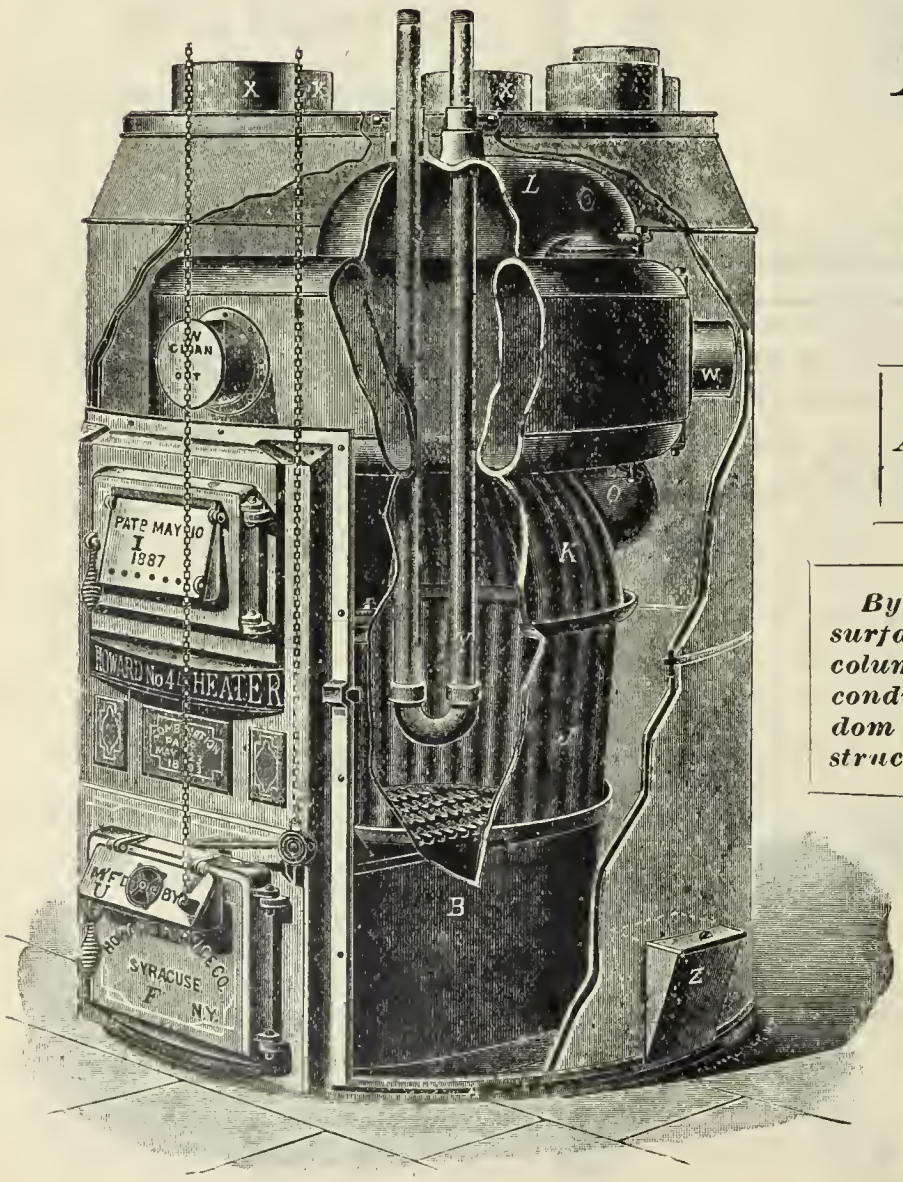
— A REMARKABLE HERO.—Lady (showing visitor the family portraits): "That officer in uniform was my great-great-grandfather. He was brave as a lion, but one of the most unfortunate of men. He never fought a battle in which he did not have an arm or a leg carried away." (Proudly) "He took part in twenty-four engagements." – *Tit Bits*

HOWARD FURNACES

HAVE

THE

GLOSS OF NOVELTY



HOWARD

COMBINATION

HEATER.

THE HEATING OF WATER IN A SEPARATE VERTICAL TUBE IS A SOURCE OF POWER.

By placing all the heating and absorbing surface vertically the water is presented in a column to the fire, and in the most favorable condition to be heated, allowing perfect freedom for the water to ascend upward, unobstructed by any CROSS CURRENTS.

HOWARD FURNACE CO.

MAIN OFFICE AND WORKS:

SYRACUSE, N. Y.

SOLD AT

New York, 210 Water Street.
Grand Rapids, 38 S. Division Street.
Boston, 61 & 63 Blackstone Street.
Toronto, 337 Yonge Street.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 30, 1895.

DAVID WILLIAMS - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....812 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Volume XLIII .....No. 13.
Index to Reading Matter.....Page 54.

The End of a Strike.

The building trades strike in New York City has ended under an agreement which is virtually a defeat for the workmen. The union electrical workers, who claimed an eight-hour working day, have had this conceded to them from May 1, instead of May 15, a matter which might probably have been arranged at first by reasonable methods. This is the full extent of their gain. Beyond this, the union has been obliged to agree that its members who went back to work before the strike was off shall suffer no penalty, and that the non-union men who took the places of the strikers shall not lose them. Thousands of other workmen in other branches of the building trades who, generally against their own inclinations but in obedience to the orders of their autocratic rulers, the Board of Walking Delegates, struck in sympathy, get nothing at all. In other words, numbers of the strikers have not only lost a month's wages, but find themselves left without employment. Thus once more has a strike entered into without sufficient justification signally failed of its purpose. What have been the consequences? Serious pecuniary loss has been suffered by both parties to the dispute; great inconvenience has been imposed upon a large portion of the community by the stoppage of building operations for a month; ill-will has been engendered between employers and employed; and, at the end, a number of intelligent and industrious workers have lost their positions and find themselves and their families reduced to destitution. All this is not offset by any corresponding good, either monetary or moral.

Why It Failed.

This is merely a repetition of the lesson which has been read over and over again within the last few years—a lesson, however, which seems hard of apprehension by labor organizations. The lesson is that a strike to be successful must be scrupulously justifiable. This one failed because it was wrong. The electrical workers had agreed to a ninety days' notice of any demand for a change in the terms of their labor, and they overrode this contract. As to the other workmen, even granting that the electrical workers had a grievance, they had none, and their so-called sympathetic strike was as entirely unwarranted an action as was the Debs railroad strike to coerce the Pullman Company last year. Strikes of all kinds are becoming so frequent, and are undertaken nowadays on such flimsy pretexts, that the public has but little sympathy left to bestow on the strikers, even at the best of times, and none at all in the case of unjustifiable strikes, such as was this one. Public sympathy, in the case of sympathetic strikes, is exclusively with those who are dependent on the misguided men and who suffer from their actions; not at all with the men themselves. This is particularly the case when workmen permit themselves to be led into wrong and foolish actions by submitting their independence to a board of walking delegates, a class which thrives on labor disturbances such as these. One gratifying feature of the late building trades strike should, however, be recorded. It was unaccompanied by a single act of lawlessness or riot. In this respect it will compare favorably with many recent troubles of the kind.

Some Signs of Improvement.

To the country at large it must be an unspeakable relief to note the signs of improvement which are multiplying on the business horizon. The developments of the past two weeks have been almost uniformly in the direction of encouragement. They point to a revival of confidence, that all-important factor without which no return of prosperity can be secured. Trade and industrial reports are more favorable. Railway traffic returns, which made so poor a showing in the blizzard month of February, exhibit so far for the current month a distinct improvement. The bank clearings last week showed a material increase as compared with last year's figures, indicating a growth in the volume of general business. Wall Street has taken the lead in the upward movement, stocks and bonds having experienced accession of strength and activity. Prices of securities are advancing steadily and uniformly. The investing public is again largely in evidence as buyers on "the street," having apparently reached the conclusion that affairs, both financial and commercial, have, since the departure of Congress, entered upon a safer stage and one from which the disturbing influences which have affected the markets for the past two years have been removed. The money market is hardening, and foreign exchanges are easier than for some time past. Silver is rising in value, and the markets for grain and cotton have advanced in a manner which would have been thought most improbable a short time ago. Recent heavy foreign buying of our railway securities indicates the beginning of a movement to repurchase at least a portion of the immense volume of stocks and bonds sent back to this country from Europe since the Baring panic. A large increase in the importations of merchandise reflects the belief on the part of merchants that there will be a brisk spring trade. In short, all signs point to the beginning of a recovery which, if, somewhat gradual, promises to be continuous. It is true that the gain in general business is slow as yet and its volume materially below that of a year of average prosperity; but it is growing, and gives promise of considerable expansion in the coming months.

Church Heating Plants.

It is probable that the weather of the past winter made more extensive repairs necessary in church heating systems than in any others, and whether the systems were steam, hot water or combination, the effect was the same. The most severe effect of the weather coming at the middle of the week, many church heating plants were without fire, no fire having been necessary during the previous portion of the season to prevent their freezing. On firing up late in the week for the next Sunday the damage sustained was discovered in many cases too late to be repaired in time for use on the following Sunday. In some hot water jobs every radiator in connection with the plant was frozen and burst, and in some cases every section of the radiator. The damage was not confined to the radiators alone, but both the flow and return pipes and the fittings succumbed to the frost. In steam plants where the condensation did not return to the boiler owing to poor piping or want of air valves, the plants were rendered unfit for service by ice bursting pipes and radiators. In churches where combination apparatus was used some difficulty was encountered in explaining that the water heating apparatus would be ruined if the furnace was run, though in some cases the risk of its destruction was taken in order to have service. It requires more judgment than is possessed by the average sexton to say when the fire shall be run to prevent freezing, and the extra labor of emptying and filling the system as a precaution is seldom undertaken.

THE LETTER BOX.

Are Gravel Roofs Durable?

From G. F. WHEELOCK, *Birmingham, Ala.*—The correspondence started by "G. D. B." in *The Metal Worker* February 16 in reference to tin and gravel roofing has opened up a very interesting question, and to me personally it resulted in a very pleasant correspondence with "G. D. B." of Greenville, S. C. I have had a couple of communications from him, and from his statements of conditions and results I give him credit for being perfectly honest in his assertion that he can put on a good tin roof for $4 per square and make money. But while those conditions exist there I have never met them in any other part of the country during my travels, which cover the Eastern and Western States and this portion of the South. In regard to the relative cost of tin and gravel roofing, I would base the price of a good tin roof laid on sheathing paper and finished with two coats of good paint at $7.50 per square, with a resultant profit to the roofer of $1 per square. Admitting that this roof with slight repairs and a coat of paint every two years at a cost of 75 cents per square will last 20 years, we have a total cost during its life of $15 per square. Now, we must bear in mind that to attain this result the roof must be looked after every couple of years. If this is neglected and the roof is allowed to rust, it will, of course, proportionally shorten its life.

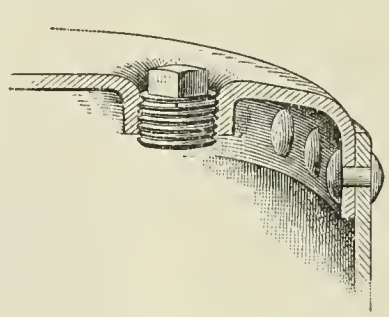
Now, as to the gravel roof, I will base my price at $4 per square for a four-ply coal tar pitch composition roof; this will give the roofer $1 per square profit. This roof will last at least for ten years, when it can be replaced at the same original cost, making the total cost for 20 years $8 per square and requiring no attention during the life of the roof. To attain this result the material and work must be of the best; and in this connection I wish to say that there has been a great improvement in the manner of doing gravel roofing in the past few years, especially the substitution of metal for the old style felt flashings and metal eave strips for the wood strip. Right here, in my mind, is the vital point, in connection with composition roofing. Any portion of the roof where it is not possible to protect the felt, on account of the position or shape, with gravel should be covered with metal, for as long as the felt is perfectly protected the roof will last.

In the laying of a good composition roof a good grade of tarred felt, weighing not less than 2½ ounces to the foot, should be used. Care should be taken that there is not less than four thicknesses at any part of the roof, well stuck together with hot pitch. In finishing the top surface with gravel, which should be not larger than ½ inch and free from sand, the pitch should be poured and not applied with a mop. To put on a roof in this manner will require about 100 pounds of pitch to the square. While I base the probable life of this roof at ten years, if asphalt properly prepared is substituted for pitch and the felts are saturated with asphalt instead of coal tar, I will place the life of the roof at 25 years, and I believe this a safe limit.

I apply a roof of this kind here, for which I charge $7.50 per square, same as first cost of a good tin roof, painted, and as between the two there is no comparison. To show the value placed upon this roof by one of my customers, who has used the same roof on his buildings in St. Paul, Minn., he says he would rather have it at same cost than sheet gold. While I hardly agree with him on this point, I do believe that asphalt, when properly prepared and applied, is the best roofing material for flat roofs in the market, copper not excepted. Coal tar pitch in time by exposure loses its oils, becomes brittle, the gravel is loosened, the felt is exposed and rots. Asphalt is not affected by exposure to the atmosphere, does not become brittle, and consequently holds the gravel securely in place. I notice that some roofers are in the habit of using pine tar pitch. This becomes very soft in summer and very brittle in cold weather, and I do not believe it possible to do good work with it.

Mending a Boiler.

From H. J., *Camden, N. J.*—About four o'clock in the morning of the day before Christmas I was called to the



Mending a Boiler.

house of one of my clients whose kitchen was nicely flooded with water. I immediately turned off the water in the cellar and found a hole in the top of the boiler from which water had been spurting until it had washed the paper off the ceiling for a space 3 feet square. The head of the boiler was of wrought iron, stamped up into a dome shape. I reamed out the hole almost large enough to receive a ¼ inch tap. Then with a tapering punch or drift pin, which I drove into the hole, I enlarged it sufficiently to receive the tap, at the same time forcing in the metal and increasing the surface which would bear on the tap in cutting the thread. After threading the hole I inserted a plug and stopped the trouble. The sketch I send shows the way it was done. I found two other small rusted spots on the top of the boiler which I have told the owner will eventually become leaks. This is not my first experience with holes of this character in a galvanized iron boiler. I have put eight plugs in a boiler in the house of one of my customers, and have found that a galvanized iron boiler will frequently show a tendency to rust out in spots in from four to six years. Sometimes they last longer—to 12 or 16 years—but in my experience I would consider a galvanized boiler that had been in use 20 or 25 years without developing any of these rust spots, which eventually become holes, as one of extraordinary durability. I thought that this experience and method of mending a boiler might be of interest to some of your readers and have sent it in.

Lining Tanks With Lead.

From S. K., *Grand Rapids, Wis.*—I would like to get from *The Metal Worker* or some of its readers some information about lining tanks with sheet lead. Is it necessary to tin the edges of the lead when round irons are used, and how is the solder put on?

Note.—In lining tanks with sheet lead where round irons are used the seams are generally wiped. In preparing the lead it should be laid out on a clean, smooth floor. A piece of lead about 3 inches wide and 10 inches long, one end curled in a circle for a handle, is used to pat the lead smoothly all over. After this is accomplished the lead is cut in sizes that will make the least number of seams in the tank, and if possible these seams will be brought into the corners in all cases. The edges of the lead from ¾ to 1 inch each side of the seam should be cleaned bright with the shave hook. The lead beyond this cleaned line may then be covered with soil to prevent the solder extending beyond the seam, or if strips of paper are pasted along, using good flour paste, the same service will be rendered. The lead lining after being prepared is placed in the tank and the method of securing it depends upon its size. In some cases, as with a small tank, it will only be necessary to turn the edge of the lead over the edge of the tank and secure it with nails. If the tank is large it will be necessary to fasten the lead at regular points in the tank by means of what is known in the trade as a bull's-eye. The bull's eye requires a concave surface to be made in the wooden portion of the tank about ½ inch deep and 2½ or 3 inches in diameter. After the lining is in the tank it is beaten smooth into these hollow spaces with a piece of sheet lead and fastened with a screw or nail. Then its inner surface is scraped clean and bright with a shave hook, and the space around it either covered with soil or paper pasted on to prevent the solder splashed against the bright surface in tinning it from adhering beyond its space; then, with a wiping pad, the space is wiped flush with solder. This makes a very firm support to the whole lining. The

lining having now been adjusted in the tank and secured by nails at intervals of 4 to 6 inches along the seams, the wiping of the seams can be commenced. With a large pot of solder at the right temperature it should be splashed along the seams and wiped with the pad until the bright places are thoroughly tinned and a sufficient quantity of solder placed along the seam to permit of a good strong seam being wiped. Here is where the round iron is brought into use. As the solder has been splashed on the seam with a splash stick and ladle, the pad should be used to keep the solder in a heap in the center, and naturally it would cool to an extent that it could not be wiped, as a space of 2 or 3 or more feet, according to the skill of the operator, will have been prepared. The seam, however, being well heated and the solder almost in a condition for wiping, the red hot round iron is moved along the seam until the whole mass is again in a fluid state; and while in this condition a clean pad, to which some tallow has been applied, is used to finish the seam. On horizontal seams little difficulty will be experienced, but in the upright seams more trouble will be found. But if the workman is skillful, there is no great difficulty in completing a neat, strong seam, with the metal at a sufficient heat to fuse thoroughly and not to be porous so as to leak.

Collapsed With a Vacuum Valve.

From S. J. L, *Catasauqua, Pa.*—My opinion as to the cause of the coffee boiler, referred to by "M. A. C.," Petoskey, Mich., March 16, collapsing, is that the vacuum valve should be on the hot water pipe and not on the cold pipe (or supply), as the hole in the delivery pipe is usually small and is liable to be closed by sediment. I have had considerable experience with copper boilers, and have found that the hot water pipe is the place for the vacuum valve, the reason for which is clear.

Inside Cold Air Duct.

From B. REESE, *Odessa.*—I notice the inquiry from "Spec. Spencer" in *The Metal Worker* of March 16, and having had no experience with inside cold air ducts would ask some of the Northwestern furnacemen to supply the information. I know that in Nebraska and Dakota the use of an inside cold air duct is quite common and necessary, as the outside air is frequently driven along at the rate of over 30 miles an hour and at a temperature of as much as 35 to 40° below zero, and under such circumstances it is quite probable that it would pass through the furnace without being properly heated, and as a consequence the building would not be comfortably warmed. Whether or not some cold air is taken from the outside when the inside duct is used is a question I should like to have answered. It is stated by some authorities that an ordinary window leaks 8 cubic feet of air per minute, and if only inside air was used leaks to this extent would provide ventilation, but in that section of country double sash are used for the purpose of preventing leakage of air and also of the too rapid cooling of the air in the room by the excessively cold temperature of the air on the glass, so that little ventilation could be depended upon under such circumstances from the windows. I should not desire to live in a house where the furnace had no other source of air supply than from the house itself, for while a revolution of the air in the house tends to economy in heating it provides no ventilation, which I consider of great importance.

An Engineer's Education Wanted.

From J. S., *Omaha, Neb.*—Please give in *The Metal Worker* a method and scale for finding how much radiation will be required to heat a room, for example, 50 x 22 x 13. What would be the best way to set the radiators? Please give a scale stating how many square feet of radiation is exposed in 1 foot of wrought iron pipe from ⅛ inch to 2 inches. Give the tables for radiation for both steam and hot water heating. What per cent. of increase in heating surface is allowed in frame buildings over brick or stone buildings? Is there any difference in the allowance made for walls, doors and windows?

Answer.—The secret of successful heating may be truly said to lie in calculating the amount of heating surface required for different buildings, and the information desired by our correspondent covers too much to be treated in a limited space. He will find a chart for calculating areas and cubic contents that will be of some service to him in *The Metal Worker* of December 8, and an article that tersely covers the subject in which he is interested will be found under the head of Hot Water Heating in *The Metal Worker* of March 2. To get the best rule on the subject about which he makes inquiry he should read some of the books that are published in reference to it. Among those that we recommend are "The Metal Worker Essays on House Heating," "Steam Heating for Buildings," by William J. Baldwin, and "Hot Water Heating and Fitting," by the same author.

The room mentioned contains 14,300 cubic feet, and in hot water heating it might be safe to calculate on one square foot of surface heating to 30 cubic feet of space; therefore 480 square feet of radiation would be required. In steam heating one square foot of surface might be used to heat 50 cubic feet of space, and 285 square feet of radiation would be needed. In hot water heating for houses or smaller rooms one square foot to 25 or 30 cubic feet of space, according to the character and exposure of the building, is used; and in steam heating work one foot to 40 or 50 cubic feet of space is generally used. One square foot of glass surface, as it is exposed in the window, is supposed to have the same cooling effect as 10 feet of ordinary wall surface. To be able to use the rules they should be read in full and studied at some length, and then applied with considerable judgment to secure the best results. The surface exposed in different sizes of pipe is given in almost all price-lists of pipe and in the books recommended. Radiators should be set in front of a window in preference to any other location in a room.

A Detail of Construction.

From A. S. R., *Saratoga Springs, N. Y.* — Would you kindly inform us through *The Metal Worker* if expanded steel flues in a cast iron house heating boiler head are more likely to leak from unequal expansion than when in a steel head? Is an all steel boiler shorter lived than an all cast iron one? We claimed that an expanded flue is the most sensible of any system of flue connection, as all high pressure boilers and locomotive boilers are put together in that way. We would like to hear the opinions of the experts on this matter.

Note.—The form of connection in most general use is of the expanded flue character; and we should prefer to have our practical readers report as to which of the two flue connections mentioned is more desirable. The durability of boilers is a question on which opinions differ, the popular opinion being that as a house heating boiler is not in use in summer a wrought iron boiler suffers more than the cast iron boiler under the same conditions. Wrought iron boilers have been in use for power purposes for more than a quarter of a century; and an all cast iron house heating boiler that was installed in a residence in 1859, doing constant service until 1894, is now doing service as a radiator in the salesroom of a heating contractor, and is apparently in good order.

Quality of Tin Roofs.

From G. L P., *Kentucky.*—The boss takes *The Metal Worker* and I find it both interesting and instructive. The views of your correspondent in the issue of March 9 on the quality of tin roofs struck the nail square on the head, and to make his article complete I would add that the tin plate factories now in operation and in contemplation in this country are doing more to kill the goose than all other agencies combined. In the first place, by seeking cheap metal and cheap methods of manufacturing tin plate, nine-tenths of them are turning out a miserable quality of plate, and in a few years, at the pace they are now going, their occupation will be like Othello's, for the simple reason that consumers will have to look for some other material for roof covering than tin or terne plate, so that in a short time it will only be a question of the survival of the fittest. When I look out of the back window of my shop I can see within a few feet of me a tin roof that I put on 25 years ago that is as sound to day as the day it was put on, and a very flat roof at that, and when I look out in another direction I see another roof that I put on but a few years ago that is leaking on account of rusting out, then I am forced to the conclusion I have expressed. I have been using American plate for the past two years and find it uniformly poor in quality, although I bought the highest priced goods in the market. The thing in a nutshell is that our tin

plate manufacturers are killing their products with acids and making use of black plates unfit to be coated.

Sheet Metal Launch.

From Louis Giclas, *Washington, D. C.*—As the inquiries continue to come on concerning the sheet metal launch, a description of which appeared in *The Metal Worker* of November 10, I wish for the benefit of the readers of *The Metal Worker* as well as myself you would publish the state ment that I will not furnish any more drawings and specifications for the launch. All information concerning the motors can be obtained by addressing the Sintz Gas Engine Company, Grand Rapids, Mich.

Is Trap Ventilation Necessary?

From A. B. K., *Burlington, Vt.*—There has been some discussion here relative to the ventilation or back airing of traps. I claim that there is no advantage in the practice except to prevent siphonage; and where there is no danger of the trap being siphoned by the use of some other fixture or other means, it is better not to run any back air pipe to make the drainage system complicated. This is an old question, but is one that is not fully settled here; and I would like the testimony of the best authorities on this point.

Note.—English writers on this subject all agree that every trap should be ventilated. This subject has been treated in the works of W. P. Buchan, P. J. Davies and S. S. Helyer. The Board of Health of New York City in preparing the plumbing code of the city decided that such pipes were necessary. The opinion of these authorities, however, is not accepted by some eminent plumbers, who entertain ideas similar to those of our correspondent. We should be glad to have this subject discussed.

Trouble with Furnacemen.

From Sanitary, *Connecticut.*—I have read the letter of "Tinsmith" in *The Metal Worker*, March 23, and considering his job from a humane standpoint, I see nothing to be proud of. Commercially he is to be congratulated on having heated the house; but can it be considered to be a sanitary job? The old proverb for health is to keep the head cool and the feet warm and, if I mistake not, he has reversed the conditions. How can the floor of a house be warm if the cellar is used as a cold air chamber? What kind of a place is a cellar to live in? Is the air that comes from a cellar any better because it has been superheated? Would it be possible to get a temperature of 94°, 8 feet from a register, if it was not superheated? Will not the air to warm a given room have to be very much hotter if the pipes are small, as he recommends? His recommendation on comparing with the job shown March 2 amounts to reducing the pipes 1 inch in diameter. A 7 inch pipe compares with an 8-inch pipe as 49 compares with 64, a reduction of one fourth, to be made up by increased temperature and velocity, both of which are wrong from a sanitary standpoint. Increased temperature means more frequent action of the lungs to get the required oxygen. Increased temperature means a dryness of atmosphere that parches the skin and membranes to irritation, coughs and inflammation. Increased velocity means drafts on the body to effect evaporation of moisture, causing a tax on the system that is paid by indispositions. How much ventilation could be ventured upon with so little inflow of air? How many changes of air per hour could be had with such small pipes? The furnace mentioned is small and would have to be run hard, to its detriment and to the delight of the coal dealer. The recommendations made are in a commendable spirit to help a brother and many may differ with me, but I think they reflect more of cheapness than of progression. The furnacemen are sneered at by other heating men and it is largely their own fault. They have followed a rut and let price govern their practice till, taken as a whole, there is less in it to be proud of than there should be. Instead of following the suggestions given the trade should advance. The underlying principles should be studied and aggressively pushed. How many furnacemen really say what the heating arrangement should be? They are so few that they are lost to sight. The veriest hatchet and saw carpenter dominates over the furnaceman and tells him: "What I say or nothing." No matter how little he knows, what he says goes. Owing to the character of furnace work, as a whole, other methods of heating that are far more expensive and not to be compared with an ideal job of furnace work are supplanting furnaces, though in effect they have little but novelty to recommend them. Furnacemen, wake up! Let us educate our less competent brothers to a higher standard and maintain it.

Boiler Siphons.

From W. C., *Paterson, N. J.*—Will some reader of *The Metal Worker* explain why water is siphoned out of a boiler which is used for heating purposes?

Note.—If more information as to detail was given in this inquiry, it is probable that a more satisfactory answer could be furnished. We assume that a boiler has been set in a room above the kitchen in order to heat the room, and that but very low water pressure is found in the system at some portion of the day. Then by opening the faucets below the boiler the water is siphoned out. It is possible that the delivery tube in the boiler has no hole in it at the top, or that the hole is stopped by sediment which causes the trouble.

A Peculiar Furnace Experience.

From C. S, *Cleveland, Ohio.*—Answering article of E. E. Palmer, Harrisburg, "A Peculiar Furnace Experience," in *The Metal Worker* of March 16, will say that he points out the cause of our trouble at fire place flue. We anticipated the trouble there ourselves, stopped it up and made a trial with no better results. In regard to the cause of objectionable drafts at present in the rooms that we endeavored to obviate, we know that a good portion is due to large glass surface in bay window. The room is never closed off; sliding doors are left open at all times. We also note what Mr. Palmer says about too much ventilation in fire place and not being able to warm certain rooms; we have had cases where we could not warm certain rooms until we opened fire place flue. The sketch shows the cold air register placed at the northwest end of room, and if leaks do occur at windows it seems to us the leakage should act as a damper at least on the cold air register, and not allow hot air to rise from it. This is quite a puzzling and peculiar experience to us, for we are at a loss to know why it does not work, having a fall of about 8 feet to the furnace. We would be pleased to hear from Mr. Palmer again through the Letter Box.

In answer to article of "R. S.," Brooklyn, N. Y., will say that he seems to be of the same opinion as our friend Mr. Palmer of Harrisburg, and that the fire place is the cause of our trouble. We have experimented there to no avail, shut off the faucet, so to speak, but did not stop the leak. Will "R. S." be kind enough to let us hear from him again?

From H. R. D., *Brooklyn, N. Y.*—I see in *The Metal Worker* of March 9 an article from "C. S." about a peculiar furnace experience, and in my opinion it is so peculiar that I do not wonder at it not working. I think the brick casing of the furnace is not properly constructed. It should be made of two chambers, an inner one inclosing the furnace proper, with openings at the bottom through which the air enters to the furnace, and an outer casing inclosing the inner casing with a space between the two and receiving the cold air supply at the top of the outer chamber. This cold air receives some heat in passing down by the inner casing and enters the air spaces at the bottom to the furnace radiators. "C. S.," has no inside chamber to his furnace, which he should have. The mason work of the inside chamber should be well pointed and the joints tightly made and then whitewashed, as bricks absorb and give off a great deal of heat. The inside chamber should also be lined with tin. He introduces his cold air at the wrong place. It should be at the top, and the cold air pipe from the room in question should be connected in the same manner. This done, I see no reason why the furnace should not work properly if the furnace is large enough and it is set properly.

Which Is Best for Furnace Tops?

From J. C., *Cleveland, Ohio.*—Answering "T. O. M.," Adams, N. Y., on "Which is the best for furnace tops?" in *The Metal Worker* of March 16, will say that the cold air in question is taken from inside the house in a reception hall under stairway opening, being 27 x 27 and cold air duct the same. The rooms that give us trouble open into this hall both first and second floors. Off the furnace are taken four 10-inch and four 9 inch hot air pipes. From the above it will be seen that our air supply is ample. The furnace is centrally located, and we are sure it is not in the air supply. We would be pleased to hear from "T. O. M." again on the subject.

A strike of seamen at San Francisco for $5 a month increase in wages has been met by the shipping of Japanese crews.

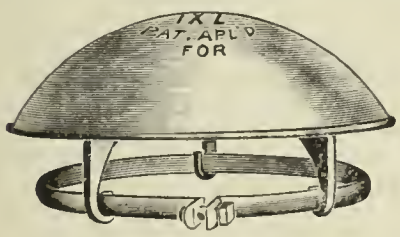
PLUMBING and GAS FITTING.

Open Work Fixtures.

In the large cities it is noticed by real estate agents and others who have property to rent that special favor is shown to dwellings where open work plumbing fixtures are used. This demand has been gratified for a long time as far as lavatories and water closets were concerned, but the economical disposition of the builder has held him to the wood incased bath, although persistent effort has been made to introduce cast iron baths and sheet metal baths of different character. It is claimed by those who are doing the work that the people are now demanding an exposed bathtub, and the manufacturers of such goods are constantly increasing their output to meet the demand. It is claimed that it is easy to sweep and clean around such fixtures, as there is no hidden space for an accumulation of dirt of any character. Various goods are made to meet these requirements, and plumbers will do well to keep informed of all the different kinds.

The I X L Vent Cap.

The accompanying illustration shows the I X L vent cap made by the Zero Valve Company, 304 Seneca street,



The I X L Vent Cap.

Buffalo, N. Y. It is made of malleable iron, and can be attached to any piece of waste soil pipe without calking and joined by simply adjusting a set screw, as no hub end is required. A wrought iron band clasps the pipe and is tightened to suit the size of the pipe. It is intended to cover the fresh air inlet or the top of the ventilation pipe above the roof.

Sanitary School Buildings.

It is quite possible that the following report to the School Board on the Mt. Pleasant school building at Nashua, N. H., by Irving A. Watson, secretary of the State Board of Health, is applicable to the buildings in many other cities.

The plumbing is faulty in several particulars and should at once be reconstructed. The effects in this respect are apparent to any one cognizant with what constitutes good plumbing. The service is deficient in traps and trap ventilation and defective in construction. The soil pipe should be ventilated into the open air above the roof instead of into the chimney flue. This pipe should be of iron, with perfectly tight joints. The present pipe, constructed of sheet iron, with loose joints, is dangerously defective, and should be remedied at once.

In my judgment, the conditions which are the most dangerous to the health of the pupils consist in the so-called ventilating system and its attendant evils. A plan like this, which provides the several rooms with an outgoing flue, but entirely overlooks the matter of providing for the entrance of fresh air, is an inexcusable oversight or neglect in providing for adequate ventilation. With outgoing flues which enter the several chimneys there is, especially in cold weather, a constant though slow exhaust of air from the schoolrooms, to supply which loss there is a forced draft upon every crack and crevice in the schoolroom. In the winter, when the windows are closed and the building made as impervious to outside air as possible, these flues amount to practically nothing in the way of securing fresh air for the schoolrooms. By reason of the exhausting force of the air escaping through the chimney flues the suction is put upon all the crevices that will admit air, including the defective ventilating flues from the water vault, as well as, possibly under certain conditions, from the soil pipe itself.

The fact exists that under the present system any defective connection with the public sewer or any unsanitary condition in the basement of the building is exceedingly liable to endanger the health of the school children, because the actual exhaust of deleterious gas, &c., must necessarily be through the school flues. These conditions in themselves constitute an ever present menace to the health of the pupils, but it is by no means all.

Aside from what has already been pointed out, the system of ventilation is deplorable; in fact, it can hardly be said to constitute a system. It is conceded by physicians, sanitarians and engineers who have made schoolhouse sanitation a study, that 1800 cubic feet of air per hour per pupil is necessary in order to secure at all times a healthful atmosphere in the schoolroom.

Many authorities place the figures considerably higher. In order to secure such a condition, there must be ample flues for the admission of fresh air, as well as corresponding exhaust flues.

The present system is practically one of direct radiation, which simply heats the same air over and over. A schoolroom that does not receive the amount of air indicated above soon reaches a state which is regarded as detrimental to the health of the children by reason of the excess of impurities which soon accumulate by exhalations from lungs, evaporations from the skin, &c.

It is conceded that unless the ventilation is ample to hold the carbonic acid gas thrown off chiefly by the lungs to below 10 parts per 10,000, the ventilation is insufficient. It is desirable that the carbonic acid gas shall not accumulate to an extent of more than 6 parts per 10,000, and in order to maintain this degree of purity in rooms like those of your schoolhouse, it would be necessary to introduce constantly a large amount of warm fresh air during the winter season.

It is, perhaps, not necessary to elaborate this point at the present time. I only desire to impress upon your board the great need of better ventilation for this schoolhouse. I believe that its greatest sanitary defect is in the lack of ample ventilation.

Niagara Ejector.

The illustrations herewith show the Niagara ejector manufactured by S. J. Putnam, Princes Bay, N. Y. Fig. 1



Niagara Ejector.—Fig. 1.—General View

shows the ejector for use in urinal stalls, to be secured into the side of the flushing pipe, which passes across the stall. Fig. 2 shows the ejector with clamp for fastening to a slate slab when the supply pipe is run behind the slab out of sight. As may be seen from the cuts the lead supply pipe may be run to this extension and connected to it by a wiped joint. The ejector can be used

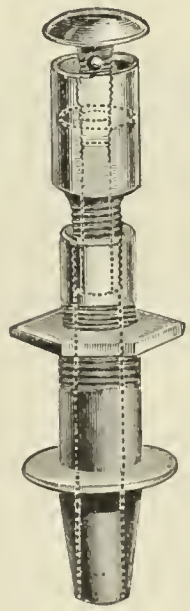


Fig. 2.—Ejector Arranged for Attaching to Slabs.

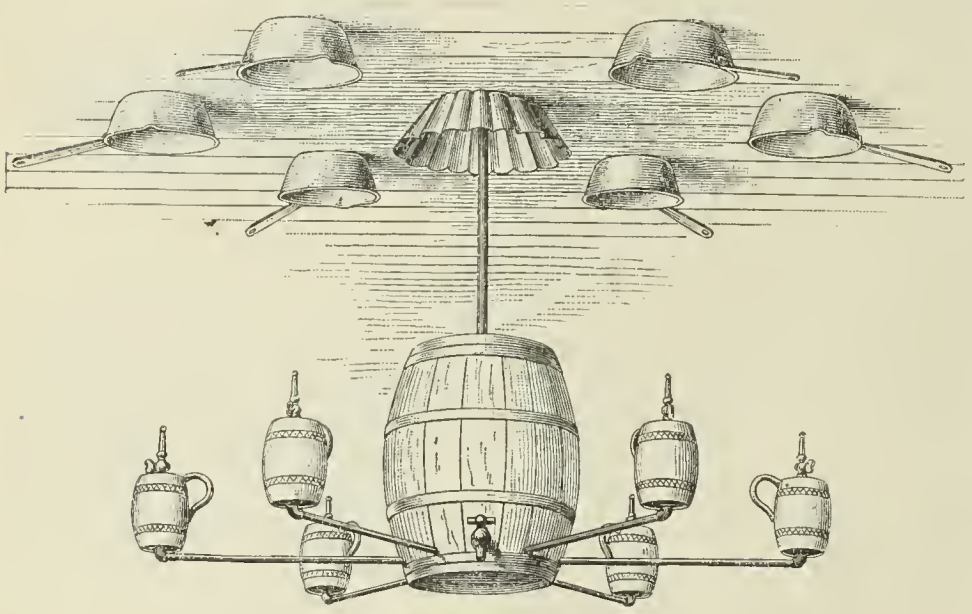
in connection with an automatic flush tank or owing to the small quantity of water used may be left to run continuously or operated by a stop cock. In operation a thin sheet of water is thrown against the slab through the slot opening as shown in Fig. 1. Fig. 2 shows the cap of the ejector partly removed and the hole through which the water is delivered. The seat against which the cap fits is cut away on the under

side for one-third the circumference so that the spray is spread. The force of the water at the outlet coming against the internal spherical head of the screw cap throws a thin fan shaped sheet of water against the back of the stall and over into the corners, flushing the entire surface.

A Unique Gas Fixture.

BY A VISITOR.

A guest of the Pen and Pencil Club of 1026 Walnut street, Philadelphia, finds considerable pleasure in being shown through their club house, the various rooms of which are adorned with mementoes of sporting, political and historical interest. No room, however, excites so great an interest and leaves so fixed an impression as the "Pirate's Den," from which is taken the subject of our illustration. This room is naturally rude and rugged in its finish and furniture. The ceiling and walls are made of slabs of natural wood, on which it is incumbent that



A Unique Gas Fixture.

each member shall carve his name, and no little artistic taste and skillful handiwork is displayed in fulfilling this requirement. Some are on the ceiling, some against the rafters, some run horizontally, others obliquely and a few are upside down. Seats are made of empty beer kegs, cushions being made of coils of rope. These surround a massive table, and the awful rules and regulations which govern all who enter this apartment hang conspicuously on the cupboard door. The den is lighted by a gas fixture. The pendant drops through a Turk's head cake mold of tin nailed to the ceiling and passes down into an empty "sextle" beer keg. Six branching arms radiate from the keg to the burner key. The burners pass up through stone beer mugs, having holes drilled through the bottom. Above each burner a bright tin stew pan is nailed to the ceiling, the handle pointing away from the center. This novel fixture is well adapted to its surroundings, and the brilliant light it sheds is no more brilliant than the repartee that passes between frequenters of this by no means gloomy den.

MAYOR COOK of Gloucester, Mass., has signed a new plumbing ordinance which is now in effect in that city. It calls for a water test, trap ventilation, local vents to closets, permits and plumbing inspection.

Thawing Frozen Pipes with Electricity.

Mr. Edmunds informs us, says the *Electrical Review* of London, England, that he has been making some experiments lately with most complete success in what we think is a new and important application of electricity to domestic use. He, like many others, has suffered the inconvenience of having his gas and water service frozen during the late severe weather. It occurred to him that a resistance, suitably protected, might be introduced into those pipes which were most exposed and least easy of access with flame or hot water or other ordinary method of thawing. He had a special wire made in which the current was conducted through a highly resistant metal, insulated with a fireproof medium that was also a nonconductor of electricity. The whole was inclosed in a metal tube, which could be drawn down to make a compact wire or tube that was externally a conductor of heat, but not of electricity, thus preventing loss of current and electrolysis. The results were most satisfactory. This "thermic" wire was introduced into the waste pipe from a bathroom at the north side of his house, which entered a fall pipe some 20 feet from the ground and which was easily frozen. The thermic wire was introduced from the outside. At night a small stream of water trickling down froze, forming an icicle some 12 inches long and 1½ inches thick, completely locking the waste pipe. The thermic wire having been previously connected with Mr. Edmunds' electric light circuit, at 50 volts pressure. when current was turned on 4 amperes flowed through it, and in four minutes a complete thawing was effected and the waste service was cleared.

Cleaning Solder.

BY OLIVER TWIST.

To make and to keep good solder it is necessary to be very careful as to what is put into the melting pot, for old lead pipe, lead tacks, &c., often contain zinc, antimony, copper, arsenic and other ingredients. Type metal is sometimes used under the impression that it is lead, whereas it is alloyed with 20 per cent. of antimony, which is as ruinous to solder as is zinc. If iron be contained in solder it is readily removed by stirring and skimming, as it is usually in the form of a powder or oxide on account of the high temperature necessary to fuse it, and never gives the trouble caused by other alloys. Sheet lead scrap or tea lead make good solder, and the failure to clean solder by the use of sulphur is often due to the fact that no tin, or not enough tin, is added after the process to make up for what has oxidized, and also to not removing the sulphur by the use of tallow.

Suit for Defective Plumbing.

A man in this town, says the New York *Sun*, brings suit against his landlord for damages for the loss of his daughter, whose death he attributes to the insanitary condition of premises occupied as a dwelling house. The principle governing a landlord's liability in these cases is well settled in England, but is hardly likely to be established in the same way in this country. The rise of the doctrine there is peculiar. The first suits were brought by landlords against tenants for non payment of rent, resisted by the tenants on the plea that the premises were insanitary.

There was a statute in existence designed apparently for the protection of the tenants, to which they generally appealed to sustain their side of the case, which, under the said statute, they generally lost, owing to its phraseology. But in the course of construing the statute the courts laid down a series of principles which soon combined to create a general case lying altogether outside of the statute. While this general case did not sustain the tenant in his refusal to pay rent, it did give him his action against the landlord for damages as to injury received in health through an insanitary condition of premises.

Next came the cases of householder and the town, landlord and the town, and, finally, contractor and the town. The duty of the town under general statutes is to remove garbage effectively. The householder would bring his action against the town for injury to his health through neglect to remove the garbage promptly. The town pleaded a proper contract made with a contractor. The decision was that the duty of the town was absolute; it was responsible to the householder, to whom it must respond, and might afterward pursue its own action against the contractor for any neglect under his contract. If the injury arose through defect in the sewer or other matter under the control of the town, the landlord had his own action against the town, but could not plead the town's neglect as a defense against his tenant.

And so on. The net result at the present time is that the health of the inhabitant is treated as the dominant interest, on the principle, *Salus Populi suprema lex esto.* If injured, the person with whom he immediately deals must respond. If this person's loss be due not to his own neglect or misdoing, but to that of the town, the town in turn must respond to him. The only recourse left to the town is against a contractor, provided one of these and not its own officers be to blame. From this it will be seen what a very long road statutory construction has yet to travel in this country before anything like these principles can be established.

HIGGINS & GRIFFIN have bought out the plumbing shop of C. B. Allen & Co., Salem, Mass., and will continue business at the old stand.

Toronto Master Plumbers.

The Toronto Master Plumbers' Association held their annual meeting in Forum Hall on Monday, March 25, and elected the following officers:

Thos. Cook, president.
W. I. Burroughes, first vice-president.
Geo. Guest, second vice-president.
I. K. Allison, secretary.
A. Fiddes, treasurer.
W. I. Garrant, sergeant-at-arms.

The new officers of the association have a large amount of work before them in getting out a new retail price-list and new by-laws for the association, &c. A special committee was appointed to wait on the city to obtain amendments to the city plumbing ordinance to reduce the license fee, and to restrict the granting of licenses to qualified plumbers only, also that all drains shall be of cast iron and under the control of the plumber, and that in future no license shall he granted unless the applicant has passed a practical examination. It is also proposed that steps will he taken to form a Dominion or National association. The Toronto association is now in a flourishing condition. Twenty-five new members were enrolled. Trade in the city is fairly good and the prospects for a good summer are favorable.

The Report of the Essay Committee.

Under date of March 30 the following report will be sent to local associations of master plumbers by the Essay Committee of the National Association of Master Plumbers, composed of Jeremiah Sheehan, chairman, Thomas Cantwell, Frederick Abel, John F. Reardon and F. R. O'Neil:

The Essay Committee, appointed to report a series of topics to be submitted to the master plumhers for treatment at the next annual convention, beg leave to submit the following list of subjects, which it regards as timely and which relate directly to the main purpose of our association. In order that the committee may have time to review the essays, which it is necessary to do before presenting to the convention, all essays must he in the hands of the chairman of the committee on or before May 15.

Is the association of supply houses beneficial to the master plumbers of the country? If not, how can it be made beneficial? This subject is suggested because the most important event of the year, having a direct relation to the interests of the plumbing trade, has been the action of all the leading supply houses and manufacturers of the country, entered into for the purpose of united action on questions of policy in dealing with master plumbers and others who are in the relation of retailers. Possibly there may be suggestions as to some means by which, through the intermediation of the National Association of Master Plumbers, this new organization may be made of avail as an agency of good, whereby some of the evils which have impaired the prosperity of the plumbing business throughout the country may be eradicated.

To what extent may municipal legislation he relied upon to enhance the standing of the master plumber? Is it not in some cases a bolster and an indorsement to the unworthy? The utterances of many master plumbers during the past two years have made it a mooted question whether, in view of the laxity, favoritism and even corruption which characterize political government, plumhing ordinances can be relied upon to accomplish the purposes which they are designed to serve. To invite full and candid discussion, the above topic is framed in a form seeming to favor the negative.

Would not the interest of the master plumber he served by an agreement that master plumbers should not handle tools? This question is suggested by the fact that many master plumhers are heard to complain that local associations, although intended to benefit all their members, work really to the disadvantage of some. The complainants, as a rule, are men who carry on plumhing as a business, rather than as a trade, and who hold that while membership in the association is accepted by the community as a guarantee that a plumber is competent and reliable as a contractor, his competitor who invests his money in advertising the trade and raising its standard is placed at a disadvantage when it comes to making estimates. In other words, the proposition is advanced that all members of a local association should be strictly master plumbers; while if they continue to handle tools they compete as master plumbers, but do the work as journeymen.

What should he the qualifications of a member of a master plumbers' organization? In other words, is it sufficient that a candidate shall bc competent to wipe a joint? This subject is intended to elicit suggestions as to the improvement of the standard of membership in master plumbers' associations. The first purpose declared by all such associations is that of elevating and improving the plumhing business so that not only the plumber hut the public will he benefited. It is urged by those who are not satisfied with progress thus far made that it is too easy a matter to become a master plumber, and that the standard in place of heing bettered is lowered by the indiscriminate admission of candidates for membership. For instance, should a candidate be able to estimate the value of work and material hefore calling himself a master plumber? Should he be able to pay his bills? Or is it enough that he shall be able to pay an initiation?

What are the abuses that have been developed in the master plumbers' organization? What is the remedy? This question is suggested by the indications that the trade has not attained the prosperity which so many of us confidently expected would result from organization. If this failure he due to the faults of organization or to the practices that have grown up under it, it will be timely information to detail just what these faults and practices are.

Should not the master plumber decline to bid as a sub contractor? Should he not insist that the plumhing he reserved from the general contract? The above question is suggested hy the fact that the contracting business has become so general that even the most incompetent carpenters are now recognized as general bidders, and the architects in their desire to avoid a division of responsibility are disposed to require the plumhers to submit their hids to these men. In many cases these general contractors are utterly irresponsible in a financial way, and the trade has suffered greatly through their failures. It should require no argument to demonstrate that a man who is competent to design and construct a good, handsome and sanitary plumbing system in a residence is too good a man to be subordinated to such incapables as are many that are now bidding on even high grade work.

TRAPS AND VENTS.

All the clay sewer pipe manufacturers of Ohio, Virginia, New York and Pennsylvania, except one, have formed a combination under the terms of which all sales are to be made from Akron, Ohio, and Pittsburgh, Pa.

Considerable information about the sewerage in foreign cities is to he found in No. 173 of Vol. 47 of the Consular Reports to the United States Government.

The Goulds Mfg. Company have just hegun the erection of a new addition to their extensive works at Seneca Falls, N. Y. The building is to he of the slow burning type, will be 86 x 35 feet in size, the frame work, beams, columns and roof truss of steel, and two stories in hight, with basement for the storage of castings. The main room for heavy machines and erecting purposes will be 22 feet high and will be served hy an electric bridge crane of 10 tons capacity. The walls will he of brick with the skylight and upper windows glazed with ribbed glass. It is expected that the building will be completed about June 1.

John Birmingham, South avenue, Bridgeport, Conn., who has heen making a specialty of jobbing plumbing work, intends to go into contract work as soon as the building season opens.

Woodruff & White succeed O. I. Jones in the tinning and plumbing business in Westport, Conn.

The Hercules Float Works is the name of a new corporation organized in Springfield, Mass., for the manufacture of the Hercules seamless copper ball floats for steam traps, receivers, &c. The officers of the new company are: President and treasurer, Harry S. Anderson; clerk, R. H. Parkhurst; directors, H. S. Anderson, H. H. Parkhurst, Frank Engelhard and Fred H. Engelhard. Manufacturing room has been secured at 54 Taylor street. The hollow copper ware of which the company make a speciality is produced by a new patented process without seams and of a quality superior, it is claimed, to hard rolled metal, being perfectly even and homogeneous throughout, without flaws and wholly impervious to water.

J. J. Cashen, who was for a long time with Wm. B. Cashen on State Street, Meriden, Conn., has established a business for himself at 65 Church street, where he has a commodious store and a good stock of plumbing and heating goods.

The Mechanics' Supply Company, Quebec, Canada, are inserting in the business directories published in Montreal, Toronto, Quebec and Halifax a colored advertising page in which they direct attention to their extensive line of goods. Among the particular articles noted are steel clad baths, Jenkins valves and packings, L. S. Starrett Company's fine machinists' tools, steam pipe packing, &c.

An obstinate blaze was extinguished by the Fire Department last Saturday night, located in the basement of James Duffy's plumbing shop, at 124 Main street, Hartford, Conn. The loss was covered by insurance.

R. M. Wilson of Rome, N. Y., reports from the New York office, 92 Walker street, New York, that a nice trade is being done in nickel plated and copper boilers. It is stated that planished copper boilers, although heavily lac-

quered, do not hold their color satisfactorily in use, and that a growing demand is being felt for a nickel plated boiler, as the nickel plate can be kept polished bright without destroying it.

When two plumbers entered into a copartnership agreement to carry on the plumbing business in Kingsbridge, N. Y., they inserted in the articles a clause to the effect that if either of the partners at any time took to the use of intoxicating liquors to the extent that it might interfere with the conduct of the business, the sober partner might have the right to ask for the dissolution of the firm. Acting on this clause, one of the partners made an application in the Superior Court asking that the firm be dissolved and a receiver be appointed. He says that the junior partner has not respected the agreement. The other partner contested the motion, stating that he had affidavits to the effect that he had never so far forgotten the clause as to put the business of the firm in jeopardy. Decision was reserved.

Allen Weinhardt will go into the plumbing business with John Freitag in the place formerly occupied by Dickhout on Wabash avenue, Terre Haute, Ind.

S. A. Worthing has purchased the interest of Mr. Osler in the plumbing business of Brock & Osler, Redlands, Cal.

A deputation of employing plumbers, Toronto, Canada, consisting of Messrs. Allison, Burroughes, Beavis, Cook, Fiddes and Guest, had an interview with the City Engineer recently. They asked that the license fee now paid by plumbers be abolished, and that the clauses in the city plumbing by-law providing for the examination of plumbers, with a view to testing their efficiency, should be enforced before applicants are allowed to undertake work as an employer.

The application of Blake & Murphy, Galesburg, Ill., for a plumber's license, with J. E. Maley and D. Morley as sureties, was granted by the City Council.

An ordinance regulating the licensing of plumbers in the city of Bradford, Pa., has been passed.

A. R. Jordan is making improvements in his plumbing shop on West Broad street, Westerly, R. I.

Curtis Bros. will open a new plumbing, heating and gas fitting establishment at 597 Main street, Dubuque, Iowa.

The firm of Daggett & Schwie Company, Mason City, Iowa, have been dissolved. Messrs. Daggett and Schwie will continue the plumbing and heating business and C. Currie & Son will run the hardware store.

Fred. Doyle and Joseph Caspar compose a new plumbing firm at Houghton, Mich. They are building a new shop on Shelden street, which will be 16 x 40 with plate glass front.

The firm of Smith & Jefts, plumbers and tinsmiths, at the Highlands, Mass., has been dissolved by mutual consent. Mr. Smith having purchased the interest of his partner will carry on the business at the old stand.

Albert C. Weiant, New Britain, Conn., visited *The Metal Worker* office this week and showed a new pipe support for which he is taking out a patent. The support can be attached quickly, and holds the pipe far enough away from the wood work to permit the use of a pipe wrench and prevent unions, cocks and fittings throwing the pipes out of a straight line.

The Glauber Brass Mfg. Company, Cleveland, Ohio, are issuing a colored picture bearing at the top an inscription stating that "Glauber's famous stop and waste cocks are the world's best and leaders over all others" At the bottom, several styles of their cocks are shown in natural color.

The S. H. Morgan & Co. plumbing and gas fitting firm have filed articles of association with the county clerk at Detroit, Mich.

John F. Deedy opened his new store in Rogers Block, at Salem square, Worcester, Mass., last Saturday, and in the evening he had a formal opening. Visitors found one of the most thoroughly equipped stores of the kind, the stock including everything in the plumbing line from the materials used in cheap houses to the costliest fixtures used in the palatial residences of millionaires. The display also contained Mr. Deedy's own inventions. The north half of the store is fitted up to show the practical working of the newest closets, lavatories, &c. It shows the latest designs in bathtubs, and the lavatories are elaborate affairs, being made of different kinds of marble. The closets are all in working order and show the different kinds of hoppers, some of them being tastefully decorated. The tanks are in keeping with the rest of the materials and are of oak, Hungarian ash, dark cherry, bird's eye maple, natural cherry, antique oak, white enamel and ash, with seats to match. In the rear are located the storerooms and the workrooms, where Mr. Deedy makes all his own traps. In the cellar are the other workrooms. The suit of rooms also includes a general salesroom and a private office.

Curtis Bros. have leased the storeroom at 597 Main street, Dubuque, Iowa, and will open a first-class plumbing, heating and gas fitting establishment.

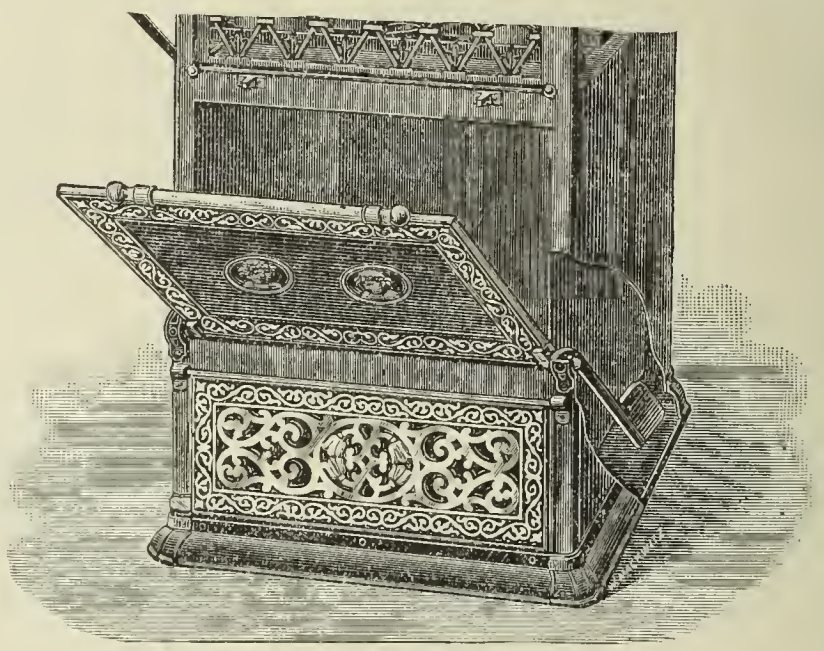
E. W. Blatchford & Co., Chicago, have just issued a small but excellent catalogue of their lead traps and bends. The variety illustrated is very large, covering all possible requirements of the trade. The Blatchford drawn and compressed lead traps and bends are made in the same manner as lead pipe, rendered stiff by a special process, while at the same time they can be drawn to any extent required. Full price-lists are also given.

John A. Mangold, graduate of the New York Trade School plumbing class of '93, intends to open up a plumbing shop at Moundsville, W. Va. As water works are being put in the town a good deal of plumbing work is in sight.

The following delegates were elected at the meeting held by the Chicago Master Plumbers' Association on the 25th inst., to attend the Illinois State convention to be held at Rock Island April 24: J. B. Breen, J. R. Alcock, P. Sanders, D. J. Rock, C. J. Herbert, M. L. Mandible, Charles T. Byrne, Paul Redieske, Thomas Conway and J. L. Emblen.

Among the new plumbing establishments recently started in Chicago can be mentioned the following: Daniel Galvin, 3246 South Canal street; Henderson & Thoile, 22 North Ashland avenue; Thomas Forbes, 795 West Van Buren street; Clayton & Miller, 475 West North avenue.

Walters, Reilly & Wafer is the name of a new firm of plumbers reorganized in Fort Dodge, Iowa. They will have their headquarters in the new addition to the Doud Block.



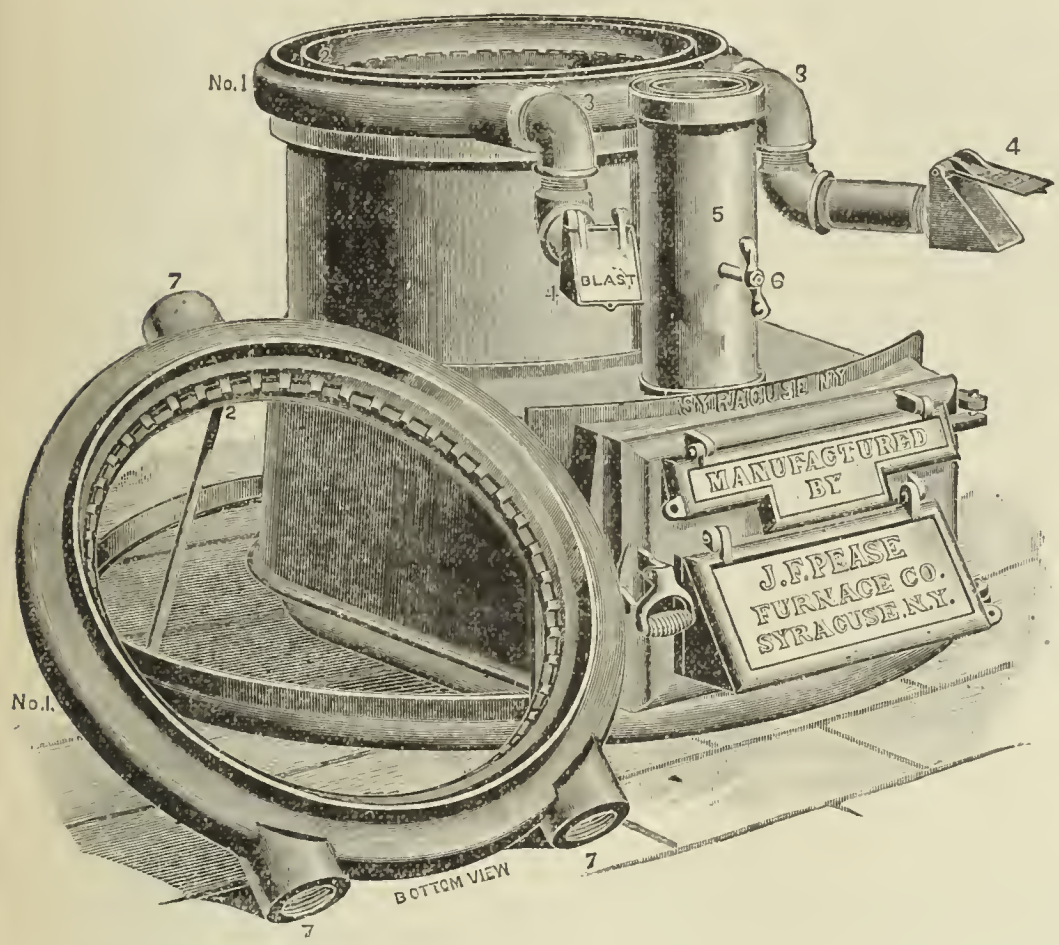
The Quick Meal Vapor Stove, Showing the Balanced Oven Door.

The Quick Meal Balanced Door.

An interesting feature of the Quick Meal vapor stove, which is being offered the trade this season by the Ringen Stove Company of St. Louis, Mo., is the balanced oven door. The arrangement is such that a weight working inside of the flue and connected directly to the hinge of the oven door allows the latter to fall to a horizontal position, where it forms a convenient shelf. An idea of the arrangement of parts may be gained from an inspection of the accompanying illustration, which represents the stove with a portion of the side broken away so as to indicate the position of the weight referred to. This weight is of such a character as to balance the door and allows it to fall without noise and also without danger of breakage. When the oven is in use the weight swings toward the front, where it assumes a horizontal position and offers no obstruction to the flue.

Air Blast Apparatus.

The J. F. Pease Furnace Company, Syracuse, N. Y., have devised an apparatus for the efficient and clean burning of bituminous coal in hot air furnaces, which is illustrated in the accompanying cuts, Figs. 1 and 2. It is well known that the burning of soft coal for domestic purposes has always been attended with difficulty arising from the formation of soot, which adhered to the heating surface, clogged the flues and reduced the radiating powers of its surface, and sometimes even going so far as to fill up the smoke exit and materially interfere with the draft. To secure complete combustion of bituminous coal the system devised by the J. F. Pease Furnace Company provides for the introduction of hot air around the surface of the fire. The air being about one-quarter oxygen stimulates combustion and consumes the otherwise unburned gases. In the device illustrated in Fig. 1 the air is drawn into the ring through three supply pipes, two in the front and one in the rear. Each of the air chutes is provided with a regulating door, so that the supply of air can be adjusted to suit the draft and other varying conditions. The air is heated to a high temperature in passing through the supply pipe and through the heated ring and is distributed over the face of the fire through horizontal slots shown in the illustration. It is mentioned that the outlet area of all of the slots is less than that of the intaking pipes, so that the air is discharged in full volume from each slot. Fig. 2 is a transverse section through the ring showing the form of the interior and the course taken by the air. The slots, it will be noticed, are protected by a canopy which prevents fine particles of fuel lodging in the openings when the fire is replenished. This feature is particularly alluded to and it is mentioned that it is covered by patents. The ring is said to be easily set, fitting into a cup joint on the top of the fire pot, and is provided with a cup joint on its top, on which the combustion chamber rests. The pipe connections and fittings can easily be put together with an ordinary wrench. These rings are provided for the Pease furnaces Nos. 308 to 320, inclusive, of the Regular Low Down Double Radiator and Tropic patterns, as well as in all sizes of the 1895 pattern. It is furthermore mentioned that they can be introduced into old furnaces of these patterns with little expense and work.



Air Blast Apparatus.—Fig. 1.—Soft Coal Burning Apparatus, Fire Pot and Ring

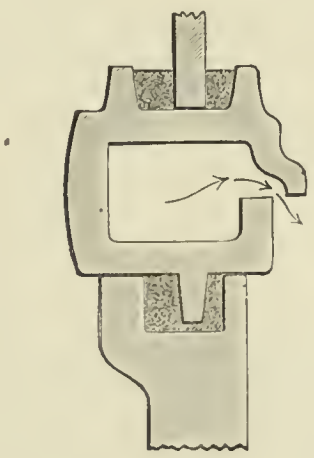


Fig. 2.—Transverse Section through Air Blast Ring.

Among the improvements brought out by the J. F. Pease Furnace Company is an air blast for hard coal also. They mention that while the combustion of bituminous coal is very much improved by the intermixing of hot air—that is, oxygen—it is also pointed out that the burning of hard coal is likewise improved by the use of similar appliances. In Figs. 3 and 4 is illustrated an air blast designed for use in hard coal burning furnaces. It is said to be particularly well adapted to the 1895 pattern furnace of the J. F. Pease Furnace Company, the dome of which is somewhat higher above the outlet than in any other furnace. It is further mentioned that the use of this small sectional air blast ring aids in the combustion of soft coal, although for most kinds of this

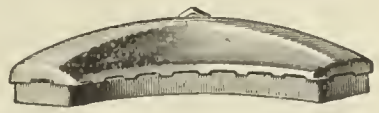


Fig. 3—Sectional Air Blast for Hard Coal Furnaces, Correct View.

fuel a larger ring is recommended. Fig. 3 shows the correct position of the distributor, while Fig. 4 shows it with the lower sides presented to view. It is fitted to the inside of the combustion chamber immediately over the top of the pot and directly opposite the feed door. The one air supply pipe runs down the

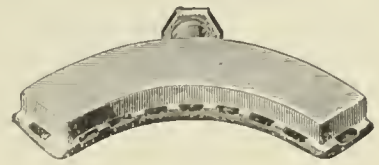


Fig. 4.—Reverse View of Section.

back of the fire pot and terminates outside the casing in an air chute with a regulating door.

The Morton Tin Plate Company, Cambridge, Ohio, whose advertisement appears upon another page, announce that they are prepared to commence the manufacture of Tin and Terne Plates. The brands will be Morton Charcoal, Guernsey Coke and Leatherwood Terne, all made by the Morewood process. The company have been manufacturing Black Plates since the beginning of the year, and their product has found favor among dippers. They state that the same care that has been exercised in the manufacture of Black Plates will be carried out in the case of the Finished Plates, only high grade qualities being produced. No selling agents have been appointed by the company, their intention being to dispose of their product direct from headquarters at Cambridge, Ohio.

It is reported that the syndicate of New York and Philadelphia capitalists who are building the electric roads in and about Baltimore and Washington, have organized a company with a capital of $4,000,000, to construct an electric railroad between New York and Atlantic City, N. J.

The use of terra cotta is becoming so widespread that the question of how to treat the surface of this material so as render it less liable to injury and decay, without impairing its appearance, is one of considerable interest. European journals announce that an effective method of treating terra cotta has been recently introduced by E. Fortora of Naples, Italy, a place where this material is largely used for decorative purposes. Mr. Fortora recommends that the terra cotta be immersed in a bath of paraffine wax at a temperature above the boiling point of water, but below that of wax. All moisture and air are said to be expelled by this treatment from the pores of the material, and an absorption of the molten wax takes place. It is claimed that all porous material of the character of terra cotta is vastly improved when subjected to this treatment, and is, moreover, rendered quite impervious to water.

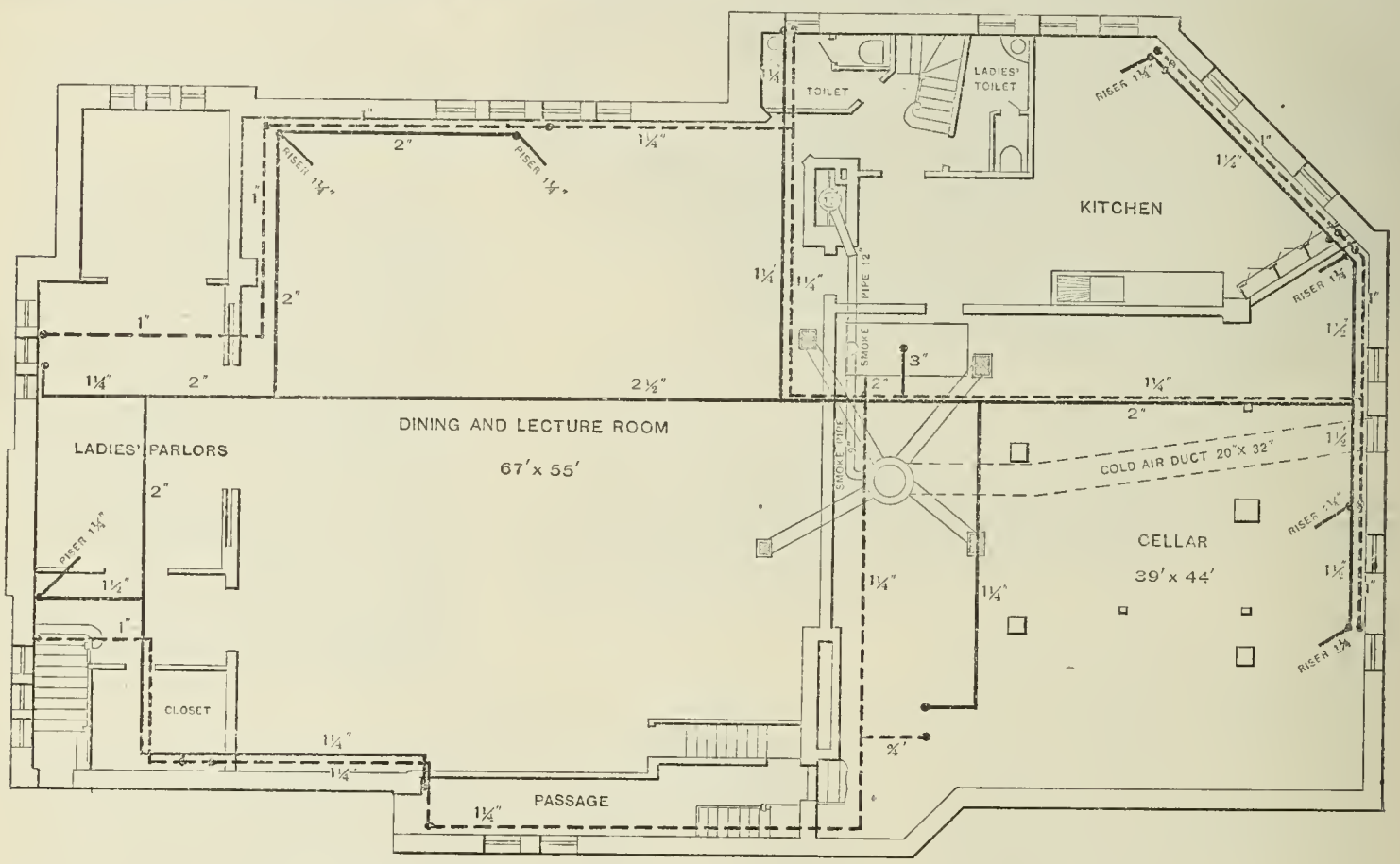
STEAM AND HOT WATER.

An Unusual Combination System.

The system of heating and ventilation used at the Andrews M. E. Church, on the corner of Richmond and Fulton streets, Brooklyn, N. Y., the plans of which were prepared by architects Kramer & Simonson, Metropolitan Building, New York, is, from its unusual character, one of more than ordinary interest. The plant was installed by S. G. Richards of 1454 Broadway, Brooklyn, N. Y., and designed by W. E. Roys, heating engineer. The heating system provides for an influx of warm fresh air, also a more direct and positive system of heating, and a method of exhausting the air from the church to secure ventilation. The fresh air is supplied by a No. 57 Pride of Brooklyn hot air furnace located as shown in Fig. 1, which is a plan of the lecture room and cellar of the church. It was installed in the cellar and supplied with air from out of doors by means of an air duct having inside dimensions 20 x 32 inches. The air when heated is conducted to the lecture room of the church and to the Sunday school room by means of 14 inch tin pipes leading to registers in the floor, there being two registers in the church and in the Sunday school room, as shown in Fig. 1. A plan of the church and Sunday school room is shown in Fig. 2. Fig. 3 shows the gallery of the church and the arrangement of the class rooms and Epworth League room above the primary room. The two pipes which lead to registers in the floor of the church are arranged by means of dampers of a special construction so that the air may be discharged into the lecture room when desired, the lecture room being on the same floor as the furnace and the pipes to the church running through it. Beside the hot air furnace is placed a No. 5 Pride of Brooklyn steam heater of pipe construction, from which the steam mains run to direct radiators located in different parts of the church. The smoke pipe from both the steam boiler and the hot air furnace connect with an 18 inch pipe made of No. 16 iron, inclosed in the ventilating shaft, which is 30 x 56 inches in size and divided into two flues, each 15 x 56, by means of a partition. In the sides of these ventilating shafts, both in the church and in the Sunday school room, large registers are placed near the floor, and a current of air is drawn from the church through them by means of the heat imparted to the shaft by the sheet iron smoke stack. A Jackson grate in the Epworth League room affords means of heating it when there is no other fire in the church, and also aids in ventilation.

From the top of the steam boiler a 3-inch main is taken, merging into two branches, a 2-inch main running under the Sunday school room, a 1¼ inch branch being taken to a radiator of 33 feet of surface in the vestibule. Then the main continues 2 inches in size until it reaches a point under the class rooms, where it separates into two 1¼-inch branches, one branch running to the primary school on the first floor, where a 1¼ inch connection is made with a radiator of 55 feet of surface and a 1¼-inch riser is taken from the end of the main to a radiator having 44 feet of surface in the Epworth League room immediately above. One-inch branches are also taken from this branch main to two class rooms on both the first and second floors, having respectively 22 and 17 feet of surface in the radiators. The other 1¼-inch branch main continues this size until connections are taken for two class rooms on both the first and second floors, having respectively 22 and 17 feet of surface in the radiators in them. Then the main ends in a 1¼-inch riser feeding four radiators, two in large class rooms on the first and second floors, having respectively 33 and 28 feet of surface, and two in smaller rooms having respectively 22 and 17 feet of surface. Immediately beneath the steam main the return pipe for the condensation from each end is run 1 inch in size, receiving the condensation from all the radiators mentioned and merging into a 1¼ inch return running over toward the boiler.

The other branch from the 3-inch main from the boiler is a 2½-inch main which extends toward the front of the church, a 2-inch branch being taken to one side of the church where a 1¼ inch riser is taken from a coil having 90 feet of surface in the gallery. From this point the main continues full size to another radiator having 133 feet of surface, near a large window in the auditorium. The principal main continues beyond this branch 2 inches in size, a 1¼-inch radiator connection being taken to a radiator having 48 feet of surface at one



An Unusual Combination System.—Fig. 1.—Showing Heating Apparatus and Piping.

side of the vestibule. The main makes a right angle turn at this branch toward the side of the church and continues 2 inches in size until a connection is taken from each of the mains just after they leave the boiler and run to radiators of 32 feet in the vestibules at each side of the Sunday school room. There are two afforded by large ventilators in the ceilings of both of the larger rooms, and to carry off the heated air when the audience has assembled and the lights

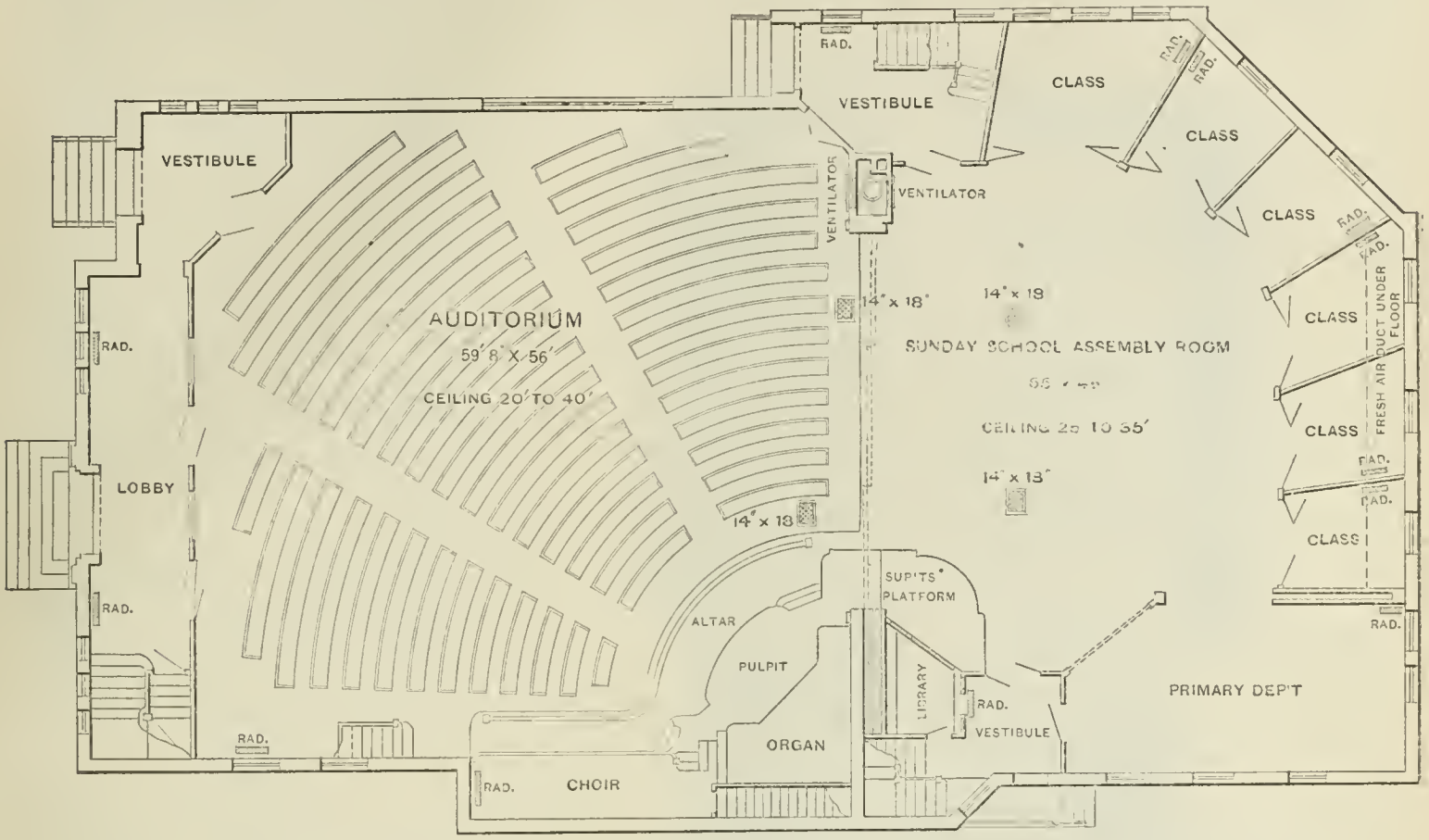


Fig. 2.—Plan of Main Floor.

to a radiator having 24 feet of surface at the other side of the vestibule. After this connection the main is reduced to 1¼ inches, running toward the side of the church, where it makes another turn, and a 1¼-inch riser is taken to a radiator having 113 feet of surface. It then continues 1¼ inches in size to a radiator having 80 feet of surface near the choir. Separate 1¼-inch branches are taken returns for condensation, each beginning at one of the radiators in the vestibules and running around the side of the church, increasing in size and connecting with all the radiators until two 1¼-inch branches meet the 1¼-inch return from the Sunday school room, where they merge into a 2-inch return which is connected with the boiler.

An additional means of ventilation is are used in the evening. In operation the plant has given excellent satisfaction, the fresh air furnished by the hot air furnace providing an agreeable atmosphere and the radiators carried by the steam boiler affording a heat that is more than is necessary for the early fall and late spring. The ventilating shaft has been very effective in carrying off the colder air in the lower portion of the

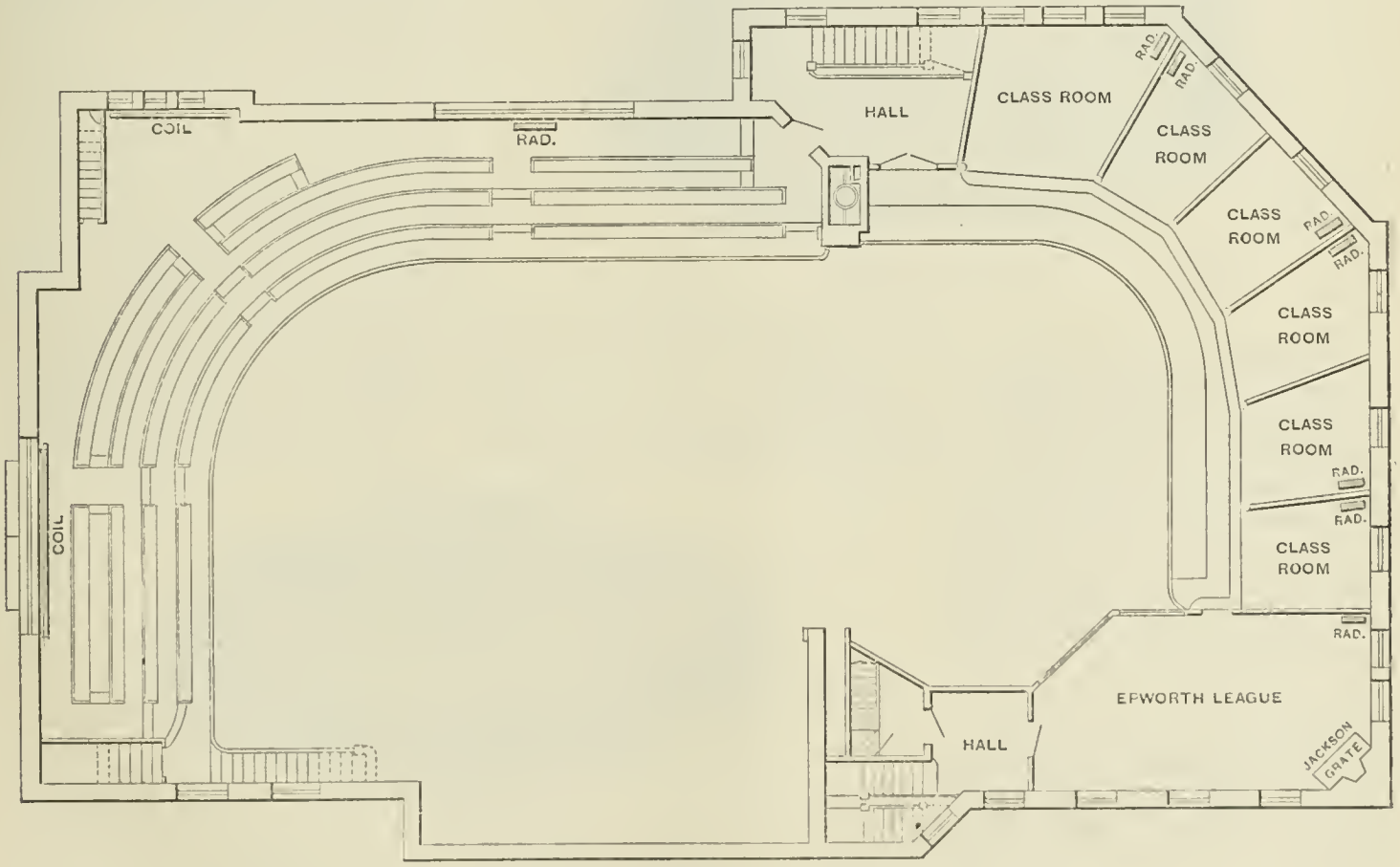


Fig. 3.—Plan of Gallery.

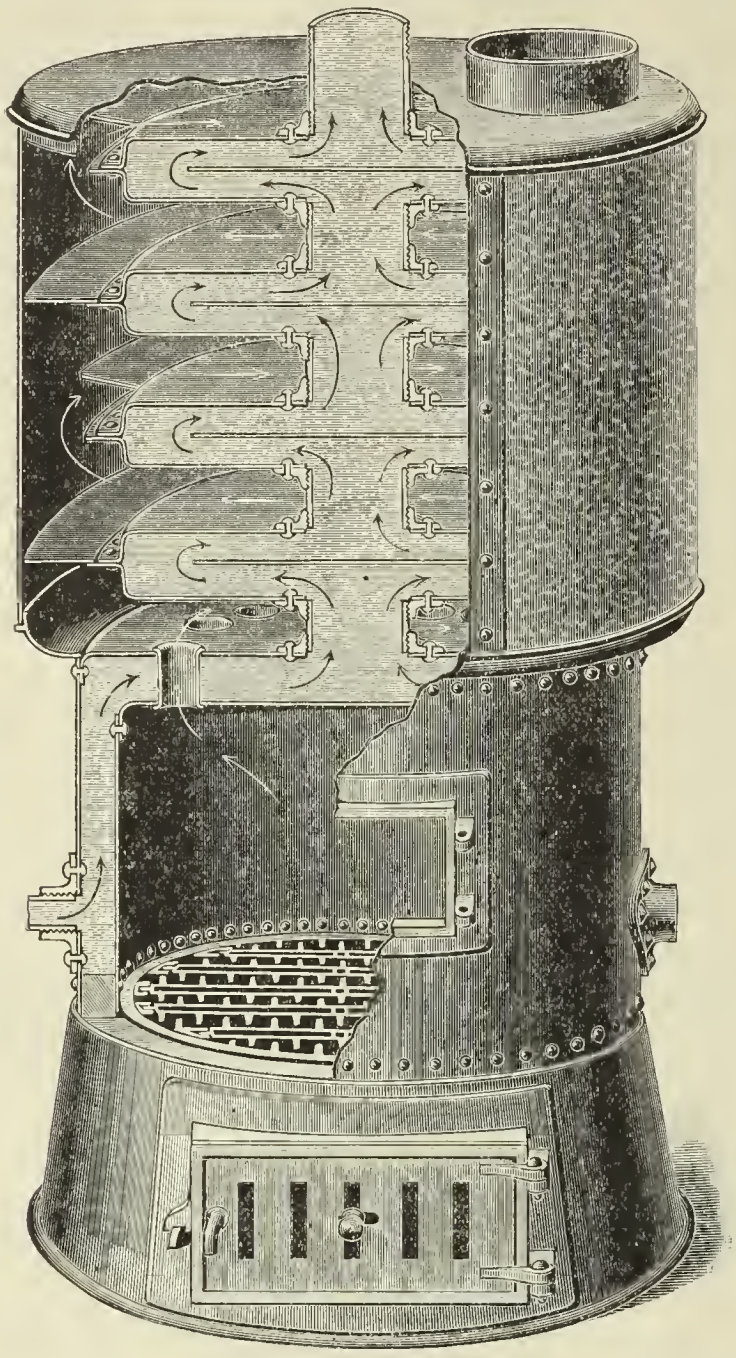
church, making it easy for warm air to flow in when the church is being heated by the furnace. A feature of the plant which has been found specially pleasing is its ability to heat the church without overheating by means of the hot air furnace when the weather is mild, and the steam radiators have been found sufficient for the coldest weather.

For those who desire to make further calculations on this heating plant it may be stated that the ceiling of the church proper is 40 feet high in the center and 20 feet on the side walls, while the ceiling of the Sunday school room is 35 feet high in the center and 25 feet high on the side walls, and that the class rooms, lobby and Epworth League rooms extend only two stories in hight, the ceiling of each floor being about 9 feet. In addition to the arrangement of the hot air furnace for heating the lecture room, the steam pipes which run through it are used as a heating surface, not being covered. The ceiling of this room is about 9 feet high.

W. H. HARRIS of the Standard Radiator Company of Buffalo, N. Y., visited Manager John Leitch and his assistant, Frank C. Perew, at the New York office, 206 Centre street, this week. Mr. Harris was returning from a short sojourn in Florida.

The Lily Steel Hot Water Heater.

Rubel & Co., 77 Lake street, Chicago, have just brought out a new hot water heater, named the Lily, on which they have applied for a patent. It is herewith illustrated. It is of the vertical type, with horizontal sections, circular in form. The sections are easily connected or disconnected, so that their number may be increased or diminished as desired. The connection is formed by a nipple, which firmly unites the sections and allows the free passage of the heated water.



The Lily Steel Hot Water Heater.—Fig. 1.—Broken View.

The broken view of the heater, Fig. 1, enables the distribution of heat and the circulation of the water to be easily explained. The fire chamber section has a number of circular holes in the top, through which the heat of the fire and products of combustion pass, being directed around the several sections by baffle plates until they reach the chimney connection at the top. The baffle plates, as shown in Fig. 2, are so arranged that they can be turned to any position, enabling the pipe collar to be shifted to any part of the top of the heater. The water circulation is arranged very efficiently. The return pipes discharge cold water into a water jacket around the fire chamber. As the water is heated it passes upward into the first section. Here a square diaphragm is encountered which causes the water to pass to the sides, becoming more highly heated on its passage and finally ascending to the next section, where the same thing occurs, and so on uutil the flow pipes are reached at the top. A large door in the top casing enables the smoke flues to be easily cleaned.

The manufacturers believe this to be the first sectional hot water heater made entirely of steel. No cast iron parts are used in the heater itself, but only in the grate, door frames, &c. Eleven sizes will be furnished, ranging from the smallest, with a capacity for 600 square feet of radiation, to the largest size, rated at 3000 square feet.

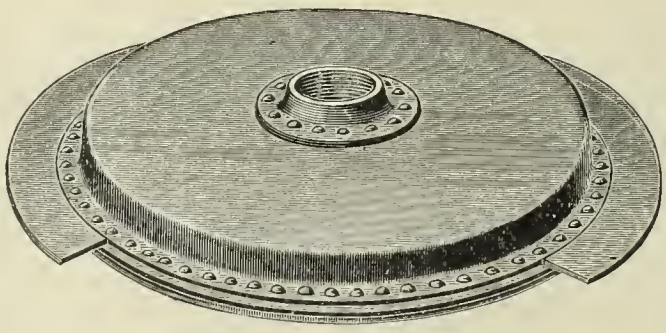


Fig. 2.—One of the Sections with Baffle Plate.

Ventilation.

From SAMUEL HEINS, *Roundout, N. Y.*—On the subject of ventilation, which is a very important one, I have a few words to say and on the popular errors which should be corrected. There are many readers of *The Metal Worker* who I know are interested in this subject, which I consider one of the most important things of a building, and the people who contemplate building should give their especial attention to the ventilation as well as the plumbing. For the last five years I have made a thorough study of this branch. There are many fairly well educated persons who cannot understand that ventilation does not necessarily mean an open window or a draft of wind, and who would fancy themselves ill provided with pure air even in the best ventilated rooms wherein these objectionable features were not certain evidence to the eye and feeling that some outside air was entering. The two ideas of wind and coolness form the whole of the public knowledge in regard to ventilation. There is also the incidental belief that foul air rises and that there must be some means provided for letting it out. This idea takes concrete form in the little whirligig seen in so many office windows and in the tendency toward opening windows at the top on general principles. The general belief and tradition is to make a hole somewhere in the upper part of the room and then all foul odors, bad air and other improper things

in the atmosphere will quietly and of their own accord and free will let themselves cut. In these crude ideas we have practically all that the public knows or cares about ventilation. In the actual practice of the individual there is no intelligent appreciation of pure air, nor can most people tell whether the air they breathe is fit for respiration. Even people belonging to the educated classes do not use the evidence of their senses in regard to the quality of the air in their houses. It is the duty of sanitary and ventilating engineers to educate the public up to a higher plane as regards ventilation, and in order to do this there must be more general appreciation of the difference between pure air and foul air from their own characteristics rather than from circumstances which have nothing to do with the case. This means, of course, that attention must be given to methods for testing the quality of air in and of itself, without reference to visible means of supplying it or to its available effects upon the surface of the human body. When this educational work has been accomplished the field of the engineer who devotes himself exclusively to ventilation will be the widest of any belonging to the engineering profession.

HEATING NOTES.

S. T. Williams is again on the engineering staff of Geo. B. Cobb & Co., 96 Centre street, New York.

The Armstrong Mfg. Company, 139 Centre street, New York, report that recently they have been quite busy on orders for their hand pipe cutting tools and adjustable dies for threading pipes. They say that there is a steadily increasing demand for their goods all through the country and that many pipe fitters that use solid dies for shop work consider a set of their adjustable dies indispensable for outside jobbing work.

J. A. Goodrich of the American Radiator Company, 92 Centre street, New York, is enjoying a well earned vacation in Bermuda.

The Orient Radiator, made by T. C. Joy & Co., Titusville, Pa., will be used in the Sachs Building, Twenty-fourth street, New York, 10,000 square feet of surface being required.

Dwight Smith, who has been recently engaged in the plumbing and steam heating business in Penn Yan, N. Y., has returned to Canandaigua.

A writer in a Philadelphia paper, in defense of steam, says in answer to the following statement: "The era of steam is passing away." There is no electric power or heat that does not trace back to a steam boiler except where there is water power. The product of steam—electricity—can never exceed its producing power; this is a common sense principle.

A gayly colored picture, cleverly imitating a special water color work by Archie Gunn, is the decorative feature of a calendar issued by the J. H. McLain Company, Canton, Ohio. Instead of sending the calendars at the time of the year which is usual for distribution, they have delayed it until the month of March, and we do not doubt they will reap benefit from distributing them at this time, when so many of the January calendars have been lost. The picture shows a young woman in springtime garb and surrounded by springtime associations, and represents, we are told, "An American Girl Up to Date."

T. C. Joy & Co., Titusville, Pa., are showing at their New York office, 48 Centre street, a sample of their new Zenith radiator, which occupies less space than the ordinary loop radiator and has a large flue surface. They have a new catalogue in course of preparation which will show their different radiators and pictures of some of the prominent buildings in which their radiators have been used.

As an indication of the prominent part the manufacture of steam fittings and heating apparatus is playing in the industries of the country, it may be mentioned that according to the last census these products were valued at over $23,000,000, and there has been a great increase in business since the last census was taken.

The United States Heater Company have completed their new factory at Detroit, Mich. The machinery was started a few days ago and the entire plant is now in full operation. They have a very complete and well equipped establishment and advise us that they are prepared to fill all orders promptly.

The catalogues issued by M. Mahony, Troy, N. Y., relating to the Mahony vertical section boiler for steam or hot water heating are attractive publications of convenient size. The leaves are held together by a silk cord at the back instead of being bound in the usual way, and have covers of tinted paper. General and sectional views are shown of both types of boilers and views of the separate sections of each are likewise presented; also a picture of the grate, as well as smaller illustrations of the other boilers made by Mr. Mahony. The cuts are finely executed and finely printed also, and the accompanying text gives a full description of the boilers, which are the same as were recently illustrated in *The Metal Worker*. The steam boiler has a capacity ranging from 1600 to 2700 square feet and the water boiler from 2700 to 4500 square feet.

Exeter radiators are being used in Mr. Jenkins'—of the firm of Jenkins Brothers, valve manufacturers—elegant new residence on Beacon street, Boston.

Lockwood & Adams, 69 Centre street, New York, have added to their line of radiation the Napoleon radiator made by Moore Brothers & Co. of Elizabeth, N. J.

John A. Scollay, 74–76 Myrtle avenue, Brooklyn, and 89–91 Centre street, New York, is furnishing a Brooklyn street directory and city guide, on the front of which is a cut of his hot water apparatus, and a notice that he makes a specialty of apparatus for heating residences and greenhouses.

The elevators in the public buildings in Philadelphia recently dropped to the cellar at the time of the day when they are most in use. Those who were on them at the time were more or less frightened. The trouble was caused by a section of the 14 inch pipe in connection of the hydraulic lift giving way. The pipe in question had been tested up to 100 pounds and was ¾ inch thick. For several hours during the day of the accident it was run at a pressure of 125 pounds, in order to do the work that was ordinarily done by another system. After carrying this pressure for several hours one section split, flooding the cellar and dropping the elevators. On examining the pipe after the accident it was found that throughout its entire length only a thin film of the metal on the outside had thoroughly fused in the mold. Under the examination the fracture showed that the metal had run together along the entire length of the pipe, but had only fused on the outer side for a very slight thickness, and showed an extended case of "cold shut."

E. W. Stradling, president of the Stradling Plumbing & Heating Company, Utica, N. Y., was one of the visitors at *The Metal Worker* office this week. Mr. Stradling reports that his company have set a large number of the Royal boilers and is much pleased with their work this winter.

The United States Heater Company, Detroit, Mich., send out one of their postal travelers showing on the back a general view of their works. The text on the front of the card tells the hard times they had in filling orders last year, because they were in the hands of their friends. Now they are making their own goods and can ship promptly.

The Kewanee Boiler Company, 96 Lake street, Chicago, are to move to more commodious quarters at 54 Dearborn street, where they have secured the entire first floor, and will have ample space for the display of a full line of Haxtun boilers and Tabasco hot water heaters.

After an interval of comparative quiet the Latin-American portion of this continent has once more relapsed into what seems to be its normal condition of revolution and unrest. Discord between contending factions in Peru has resulted in bloody hostilities at Lima, followed by the establishment of a provisional government consisting of representatives of both parties, a condition of things which cannot long exist. War is threatened between Chili and Argentina, in which Bolivia and Ecuador may be involved. An uprising in opposition to the existing government is reported in Salvador; Venezuela is more or less embroiled with some of the European powers, and the island of Cuba is the scene of a serious revolution, which has paralyzed trade in that country.

United States Consul Germain, at Zurich, is of the opinion that there is an opening for the introduction into Switzerland of American wood working machinery and tools. He writes that if a good agent, speaking French and German, were sent out to visit Swiss manufacturers he would be able to secure large orders. He also thinks that American manufacturers in these lines might find a good market in Germany, England, France, Austria, Hungary and Italy.

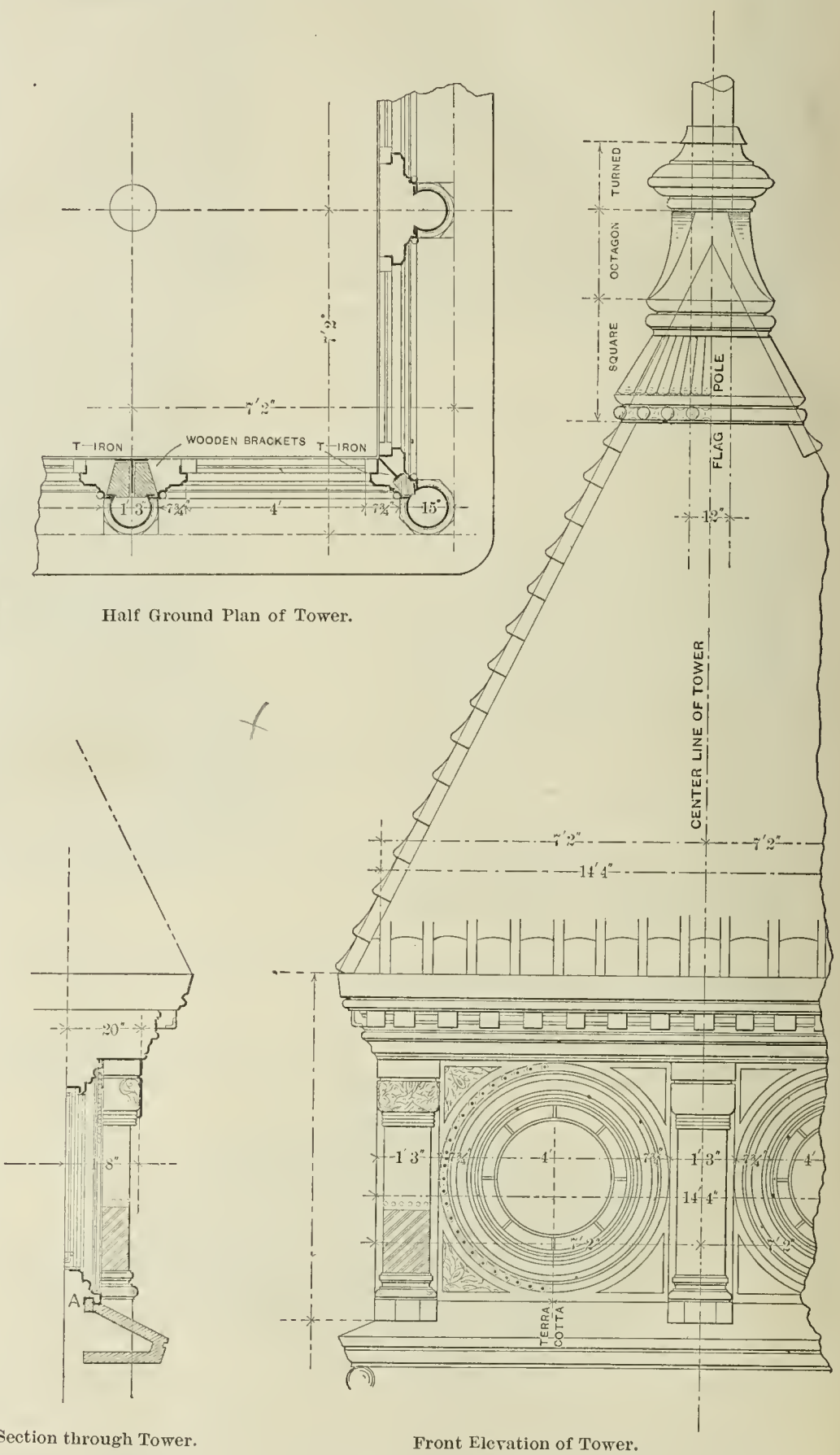
Judge Lacombe, in the United States Circuit Court, New York, dissolved last week five injunctions, issued on July 7, 1893, restraining a number of electric light and illuminating companies from infringing a patent for an improvement in electric lights granted to Thomas A. Edison, and controlled by the Edison Electric Light Company and the Edison Electric Illuminating Company of New York. The injunctions were dissolved on the ground that a prior patent, issued to Edison in Canada on November 17, 1879 for 15 years, has expired.

ROOFING AND CORNICE.

Tower Work in Copper.

BY W. N.

The front elevation, section and ground plan printed in Fig. 1 show the copper work of a tower which was recently executed of 16-ounce cold rolled copper. By referring to the front elevation and section, and to Figs. 2 and 3, it will be seen that the foundation of the copper work is terra cotta. Of particular interest are the methods of fastening the copper work at the building, and for this reason the details of construction have been prepared. T C in Fig. 2 represents the terra cotta cornice, which is L-shaped at the top, as shown at S. Over this L-shaped terra cotta the flashing A is formed, as shown in Fig. 2, and prevents the water from getting inside of the building. This flashing A is placed around the entire tower, the corners and cross seams being soldered water tight. It will be noticed that the flashing extends down the inside, as shown at S, and is slightly bent downward, as shown at B. The corners and cross seams being soldered, no other fastenings are required, as the flashing is bent so as to spring tightly over the terra cotta. The columns shown on the front elevation were then set, and fastened at the bottom by soldering to the copper flashing at the bottom, and fastened at the top by screwing to the wooden brackets which are bolted to the T-irons shown on the ground plan, Fig. 1. The cornice shown on front elevation was then set over the columns and secured by means of copper wire and bands to the iron frame work of the tower. The next step was the setting of the circular windows shown on the front elevation, which, as will be noticed, are inclosed in a square panel. Fig. 3 shows the method of fastening these windows, which is as follows: A represents the terra cotta, B the flashing over the terra cotta and L the drip which is formed to the bottom of the windows and soldered to the flashing B at D. The flange C in Fig. 3 extends around the other three sides of the window, and with copper rivets is riveted to the flange of the columns and cornice. All braces are fastened by means of brass bolts and copper rivets. After all this work was completed the roof was covered with Spanish tile, which were nailed to the porous terra cotta blocks. Over these tiles the copper flag pole base was set, as will be noticed by referring to the front elevation. The lower part of the base is square, the middle part a transition from square to octagon, and the upper part round. V, in Fig. 4, shows a sectional view of the flag pole, and also shows the method of obtaining a water tight joint at the top. V represents the circular molding placed around the top, with a space of 1 to 2 inches from the top of the molding A to the side of the pole. This space is allowed so that in stormy weather, when the pole begins to sway, it will not injure the molding or cause leaks. The funnel or collar B is placed over this molding, the collar having a space of 1 to 2 inches around the top of the molding A, and is nailed closely in white lead against the pole. To be perfectly sure of a water tight joint, another collar, shown at C, is placed over the funnel B, leaving a space between the two funnels, and is nailed in white lead to the flag pole. A hook edge is bent at A as shown, so as to catch the snow when blowing under. This method of construction around the flag pole also gives ventilation under the tower roof, as shown by the arrows in Fig. 4. In many cases where the molding A, Fig. 4, was nailed direct to the flag pole, it has been broken when the flag pole began to sway, causing



Tower Work in Copper.—Fig. 1.—Elevation, Plan and Section.

leaks; and it is an expensive matter to stop leaks in such a place, owing to the difficulty of reaching the pole.

Slate for Roofing.

In an interesting article discussing the various forms of roof coverings employed since the early history of the world, G. B. Benfoid presents in a late issue of *Stone* some remarks on slate which are worthy of repetition in this connection. Among other things he says:

The first slate used in this country, undoubtedly, was brought over from Europe, although it was known that slate could be found in this section of the country, yet it was a long while before any person began to make any use of it. The first quarry had been opened for nearly eight years before any roofing slate was manufactured.

The first quarry in the neighborhood was opened by Col. Allanson Allen of Fair Haven, Vt., in 1839, at Scotch Hill. He manufactured school slabs extensively; in 1847 he commenced the making of roofing slate, and in 1848 he abandoned the school slate trade in favor of that of roofing slate.

The first roof covered with Vermont slate was done by Col. Allanson Allen in 1848, and under these conditions: He was to wait one year for his pay, and if in the mean time the roof should break down from the weight of slate he was to receive no pay, but should pay all damages. The farmer was disappointed, and the roof is good to-day. . . .

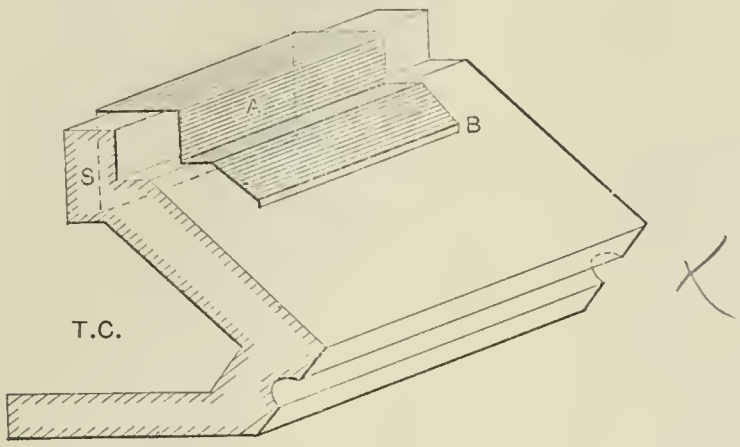


Fig. 2.—Copper Flashing Over Terra Cotta.

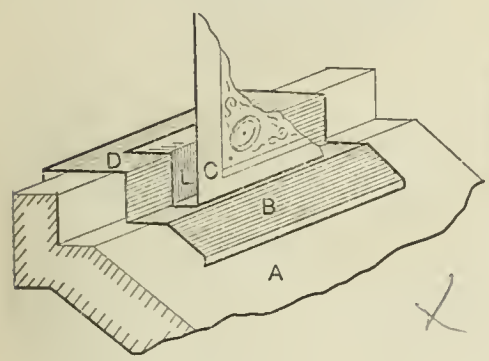


Fig. 3.—Method of Fastening Circular Windows at Bottom.

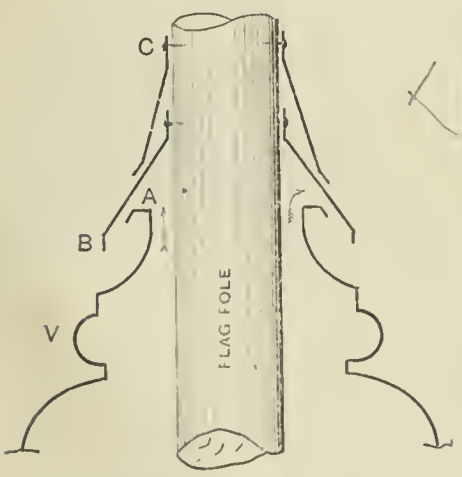


Fig. 4.—Section Showing Water Tight Joint at Flag Pole.

A few words in reference to the color of a slate roof may be of some use to those who have not heretofore taken that into consideration when painting their house. When one has a great body of a decided color on a roof, as green, purple, or red is, they should carefully select some shade that will harmonize generally with their roof. That is the reason that some green slate looks brighter, some purple richer and some red more lively, because either knowingly or unknowingly there has been a judicious harmony carried out, by a correct juxtaposition of color. On the other hand a man may paint his house with precisely the same colors as his neighbor, but there is a something about it that he does not understand; it does not look so well as neighbor Brown's. Let him look at his roof. Five times out of six the roof kills the job. Not because anything is amiss in the roof itself, but because of the want of a little artistic taste in color harmony. Neighbor Brown's house was the right color to match the slate. I have just called attention to this because it is one of the peculiarities I have noticed.

A slate roof lends itself very easily to decoration. I have seen mosaic borders and bands of parti-colored slate which were artistic and striking as a method of advertising. No large firm who have an extensive run of slate roofs should fail to put in their name and trade in lighter colored slates than the body of the roof. It stands as long as the roof, because it is a part of it. No iron or wooden signs to blow down, no paint to wash off, an imperishable signboard. Hence to sum up, a slate roof combines the greatest strength with the greatest endurance; slate if good and put on well lasts longer than the proverbial lifetime. The writer knows of a roof that was slated about the year 1680 in one of the royal dockyards of England. About 25 years ago it was found necessary to pull down the building and build a larger one. The greater portion of these slates were placed on the new building. It was also remarked at the time that very little repairs had been done on the roof during the nearly 200 years it had stood. In any of the old churchyards can be found gravestones, anywhere from one to 1400 years old, made of slate, and some of the letters seem to keep as fine an edge as when first cut. Then, summing up still further, slate is fire proof, and vegetable matter does not easily attach itself, and hence all water running off it is, as far as the slate is concerned, chemically clean, is free from offensive, smell of decayed wood or moss, as is the case with wooden roofs when old. It requires no paint to keep it water proof as does iron, tin or felt. In truth it is a roof that protects without a constant and continual outlay of money to keep it so that it will protect.

The Roofer.

It is a little too early yet for the roofer to be busy on new buildings, but the time until they are ready should not be wasted. The winter always puts a strain on tin roofs and gutters, with its freezing temperature at night and the heat to which the roof is subjected by the noonday sun. Then the ice in the valleys, gutters and leaders is apt to leave them in a condition for repairs. The paint on a roof is liable to crack or scale from the winter strains, and a fresh coat is the only safeguard against rust and ruin. The roofer knows this, but unless he brings it to the notice of the property owners in his locality it will profit him little. He had better make an inspection of the condition of the roofs of his neighbors and furnish a report free than to sit idle waiting for something to turn up. This will give him an opportunity to talk about the quality of roofing and to impress his hearers with the difference between low priced and good roofing. The starvation price of roofing is the complaint of roofers all through the country, and will be until the roofer has talked good roofing in a way that will let the layman understand the great difference that a cent or two will make in the quality of the material used and the durability of the roof.

This is a good season for some missionary work, and if samples of tin of good size and various qualities are carried along with paper between to prevent rubbing they will lend interest to the conversation. There is a vast difference in the quality of roof paints used, and if some of the tin samples are painted with different grades of paint some benefit will be derived. A set of such samples kept at the shop neatly arranged with tissue paper between them and wrapped in a neat paper will impress the customer that there really is something more in tin and painting than the price, which has too long been the prominent feature of roof talk. Some men spend a good many spare hours and odd minutes in getting just the right wording for a postal card or a small circular which at this season they send to those who own roofs or will be buyers in the future. Roofing well done is not the common labor that its price would

often suggest, but is a work in which skill and judgment are required, and some effort should be made to raise the value of good work in the estimation of the buyer and thus lead to its being made more profitable.

Sheet Metal Ornaments.

We show in the accompanying illustrations specimens of sheet metal work made by James White of Brooklyn, N. Y. The examples are taken at random from the extensive assortment manufactured and serve to illustrate some of the work that he does. The leaf ornament, Fig. 1, is deeply stamped and measures 16 x 16 x 27 inches, and the bracket shown in Fig. 2 measures 16 x 28 x 8 inch face. The ornamental sheets of which a section is presented in Fig. 3 are 16 inches wide, while Fig. 4 shows an ornament 16 x 19 x ¾ inches in size. The claim made by Mr. White for this work is that all the designs are original, everything having been carefully modeled by his own artists, being made for some specific purpose and afterward put in stock. Mr. White has also given great care to the manufacture of his cornice trimmings with a view of producing a high grade of stamped work. All the ornaments, of which a very extensive collection is shown in his catalogue, are carried in stock in zinc and are made to order in copper, brass and other metals.



Sheet Metal Ornaments.—Fig. 1.—Leaf Ornament.

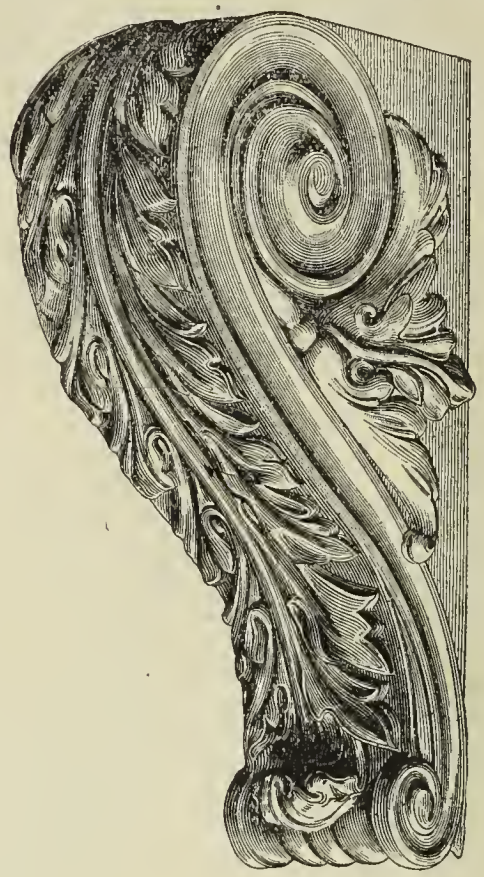


Fig. 2.—Bracket.



Fig. 3.—Ornamental Sheet.

FLASHINGS.

THE OLD JONES BELL FOUNDRY at Troy, N. Y., has been leased by W. H. Squarey and Dr. Billfinger of Elizabeth, N. J., who will, it is reported, use it as a plant for the manufacture of tarred roofing paper.

ALLEN ACKERLY & Co., 171 Vine street, Cincinnati, Ohio, send out circulars calling attention to the "everlasting staying qualities" of their Anti-Rust Japans. One of the testimonial letters is a *fac-simile* letter from the War Department speaking in the highest terms of the Anti-Rust Japans, which have been applied on all the metal roofs of the extensive buildings at Fort Thomas military post. Another testimonial is from a brewery engineer who heartily indorses the material.

WATSON H. BLISS & SONS, Hartford, Conn., are manufacturing the Hill extension ladder in New England. The ladder is made of Canada spruce with oak rounds, and is said to weigh 1½ to 2½ pounds per running foot, and is made in lengths from 16 to 50 feet. The extension part runs inside of the ground section and can be readily separated, making two ladders when desired.

WE LEARN from W. J. Burton & Co., Detroit, Mich., that they are enjoying an improved trade in their metal shingles and tools. During the past ten days they have made shipments of their Eastlake shingles to Chicago, Toledo, Columbus, Texas, California and various points in Michigan. They also are having a better business in gutters and conductors.

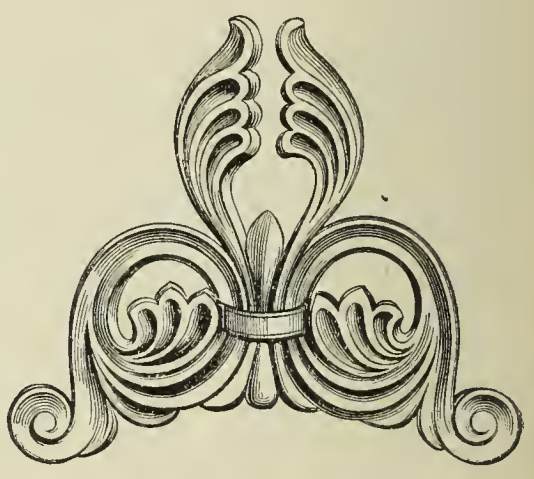


Fig. 4.—Stamped Ornament.

SCHWING & FRISWELL, Bridgeport, Conn., have completed their large contract at Bedford, N. Y., and also a galvanized iron cornice for the Southport Savings Bank. They have also commenced work on the cornices and bay windows on the Atlantic Hotel.

GLOVER SANFORD'S SONS, Bridgeport, Conn., are raising their store building one story and will cover the front with galvanized iron in imitation of stone.

THE UNITED SALT COMPANY, Cleveland, are just completing the rebuilding and enlarging of their works since their fire. They have a very extensive and complete plant. Their buildings are fire proof, frames and covering being entirely of iron. The Garry Iron & Steel Roofing Company of Cleveland furnished the material and erected the entire plant.

JAMES WHITE, 446–456 Adelphi street, Brooklyn, N. Y., has published a catalogue of sheet metal architectural ornaments in zinc and copper, which is a publication that will be of much interest to the roofing and cornice trades and all those who make use of sheet metal ornaments. The publication is in the form of a portfolio, bound in heavy manilla paper, tied at the back with a string and measures 9½ x 6 inches. Altogether there are 80 odd pages in the book, the sheets being of heavy paper and printed on one side only, giving the whole a very handsome appearance. The publication is not encumbered with unnecessary letter press, the only thing being an announcement at the beginning of terms, discounts, &c. The illustrations cover a most extensive variety of handsome work and will be much appreciated by the trade. Accompanying each cut is a number for ordering and particulars of size and price. In addition to the architectural ornaments there are given at the end illustrations of sheet metal pipes, skylight bars, flashings, skylights, fireproof doors and shutters, ash chutes, &c., while the last page carries an alphabetical index of the contents.

THE KANSAS CITY METAL ROOFING & CORRUGATING COMPANY, Kansas City, Mo., have moved from the Builders' and Traders' Exchange to 416 Delaware street, where they have greatly enlarged facilities for handling their steadily increasing business. The building is well adapted to their business, and they will carry full and complete stocks of all goods handled by them.

WE HAVE RECEIVED a circular from P. H. Laufman & Co., Limited, Apollo, Pa., referring to their well known specialty, Laufman's Apollo terne, or leaded sheets, in large sizes, adapted for car roofing, eave troughs, conductor pipe and cornice work. These sheets are made 20 to 36 inches wide and 60 to 120 inches long and from No. 17 to No. 30 gauge. Attention is called to the fact that the sheets are made by oil process and not with acid flux.

BELL'S GALVANIZED WIRE EAVE TROUGH HANGERS, which have been on the market for some ten years, are still growing in favor with the trade. The hanger is made of one piece of heavy steel wire galvanized and is so formed as to be a brace and support to the trough and keep it in shape as well as in place. It is constructed so as to admit of it being placed on the trough and fastened, and the trough hung very quickly and with the expense of the least time and labor. The manufacturers refer to their convenience in shipping, being neatly bunched. The hangers are sold chiefly through jobbers, but samples will be sent by applying to the manufacturers, John W. Bell & Co., Mercer, Pa.

GARA, MCGINLEY & Co., 23 South Seventeenth street, Philadelphia, Pa., send out memorandum pads reminding the trade of their business as roof repairers. At the top of each sheet is an original observation or quotation respecting their business. The back carries a request to "Stick this on your 'phone," and the glue, by which the sticking is done, is all ready for moistening.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

JAMES E. CAMP of Bridgeport, Conn., is building a fine residence which will have a plumbing system and will be heated by hot water.

M. J. DALY, Waterbury, Conn., has just taken a large contract in New Haven for the Winchester Repeating Arms Company to construct a fire hydrant system, 1100 feet long, of 8 inch cast iron pipe.

ASHTON & GARRITY, Waterbury, Conn., have the contract for the plumbing in the new residence of Rev. J H. Duggan.

THE GRISWOLD, RICHMOND & GLOCK COMPANY, Meriden, Conn., are finishing up their big contract for placing the indirect steam heating pipes in the Old People's Home. The contract is a very large one, involving the working up of more than 20,000 pounds of galvanized iron.

GEO. L. MCQUIGG, Flint, Mich., has closed a contract with Father Murphy for a hot water heating system for his residence; also for a hot and cold water plumbing system.

THE Board of Public Works of La Crosse, Wis., will advertise for proposals for heating and ventilating the new school buildings on the plans and specifications of the Sturtevant Company.

THE Board of Supervisors of the Almshouse at Canton, N. Y., are about to expend $1500 for some system of heating and ventilation to be selected.

THE contract for plumbing the new Merrill Block has been let to Bovett & Noble, Pittsfield, Mass.

CLARK ELLIS & SONS, Milford, Mass., have been awarded the contract for the plumbing at the new school building.

KRUSE & DEWENTER, Indianapolis, Ind., have been awarded the contract to furnish the heating and ventilating apparatus for the new medical college in that city, and for the High School Building in Pendleton.

POSTMASTER DAYTON has received word that the contract for reconstructing the entire plumbing of the New York City Post Office was awarded to Blackburn & DeGraw of New York, the lowest bidders, at $28,500. The work is to be completed in 90 days from the signing of the formal contract, which will be about April 3, and about April 15 advertisements will be published for arranging the ventilating system of the Post Office.

R. J. O'CROWLEY, Newark, N. J., is doing the plumbing in a house for D. A. Robinson.

THE heating and ventilating apparatus for the new school house at Milford, Mass., will be supplied by the Fuller-Warren Company, Troy, N. Y.

BARLOW BROS., Waterbury, Conn., have commenced work putting in the heating apparatus, which will be run by steam, in the new town hall at Watertown.

CROOK, HORNER & Co. of Baltimore, Md., have been awarded the contract for furnishing the steam heating and power plant for McMahon Hall of the Catholic University at Washington.

J. H. COGAN & Co., Augusta, Maine, have just taken the contract to furnish the residence of Hon. J. H. Manley, Hospital street, with one of the Richmond steam heating systems.

THE CONTRACT for plumbing the new block to be erected by Edson J. Hill, on Hill's avenue, together with contracts for gas piping and steam heat, have been awarded to Lee Bros., Concord, N. H.

BIDS will be received at the Board of Education at 713 Filbert street, Philadelphia, until April 2, for a new boiler in the Mt. Vernon street school, alterations and additions to heating Adamson and Fairview schools, also for heating and ventilating the Curtin school, the addition to the Fair Hill school, the Disston school, and the school at Forty-sixth street and Woodland avenue.

THE DEPARTMENT OF PUBLIC INSTRUCTION, Brooklyn, N. Y., will receive proposals at the secretary's office, 131 Livingston street, until April 2, for heating and ventilating the new school No. 108. Plans and specifications may be obtained at the office of the chief engineer in Red Hook lane. Bids will be received for steam and the combination of steam and hot water separately.

SEALED PROPOSALS will be received by Howard School Board until noon April 17, 1895, for a system of heating and ventilating Park school, Ligonier street, Sixteenth Ward, Pittsburgh, and old buildings of Bloomfield school, Ella street, Sixteenth Ward. All bids should be addressed to John H. Rhine, Secretary, 317 Edmund street, Pittsburgh, Pa.

JAMES BIRNEY, 2002 West Madison street, Chicago, has the contract for the plumbing and drainage in the flat building of Alfred Halmberg, on Marvin avenue.

HARRIS BROS., 3239 State street, Chicago, are to do the plumbing and drainage in the flat building of John M. Gartside, 4327 Drexel boulevard.

JACOB KIESSLING, 1199 Milwaukee avenue, Chicago, has contracts for the plumbing and drainage in the flat buildings of L. Ludke, 726 Dudley street, and H. Rether, 699 Davis street.

THOMAS WIXTED, 5553 South Halsted street, Chicago, has the contract for the plumbing and drainage in the residence of J. Elben, 5614 Carpenter street.

TAFFE & LEIBRANDT, 3025 State street, Chicago, have the contract for the plumbing and drainage in the flat building of Charles Leibrandt, 5312 Indiana avenue.

HANLEY & CASSEY, 21 Quincy street, Chicago, have the contract for the plumbing and drainage in the flat building of A. S. Bradley, 5453 Monroe avenue.

PETERS BROS., 1726 North Clark street, Chicago, have the contract for the plumbing and drainage in the flat building of A. Lemmert, 221 Baxter street, Lake View.

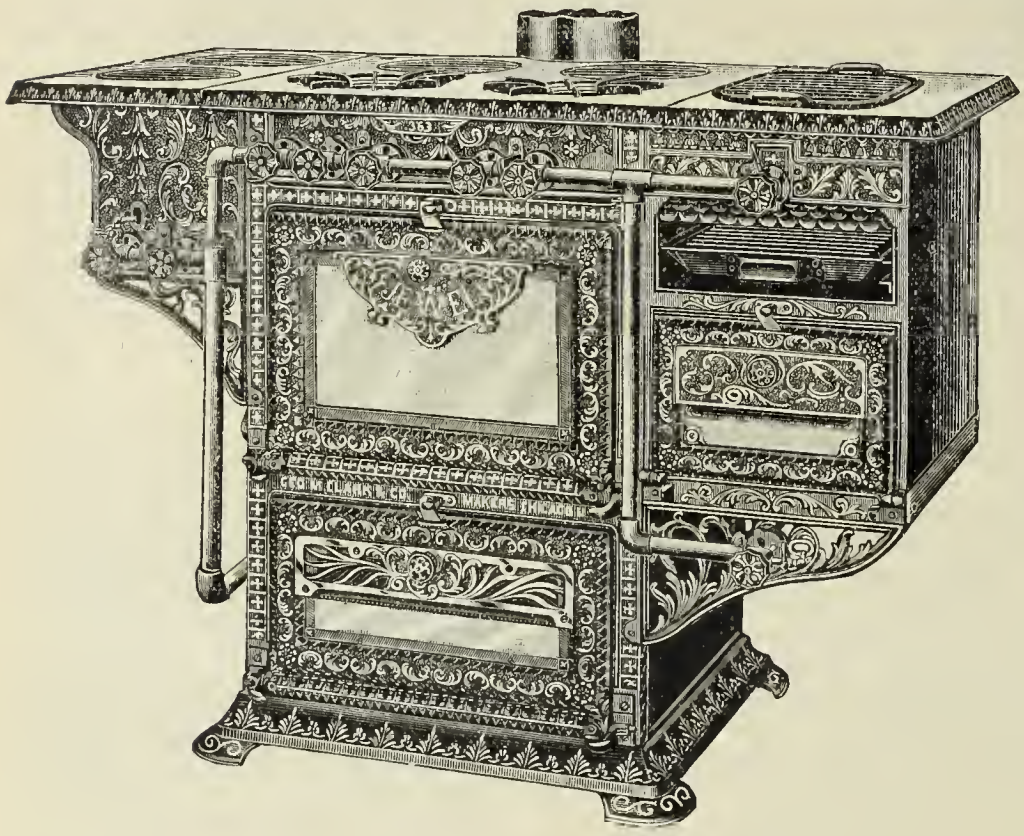
GEORGE HAUSLEIN, 1179 North Halstead street, Chicago, is to do the plumbing and drainage in the store and flat building of E. Behm, 805 Clybourn avenue, and in the flat building of E. C. Yerlon, 964 Perry street.

CHARLES P. MARTIN, 6406 Laflin street, Chicago, is to do the plumbing and drainage in the flat building of M. Larson, 6353 Morgan street.

THE RETAIL STORE.

New Jewel Gas Stoves.

George M. Clark & Co. of 149–161 Superior street, Chicago, Ill., have added to their already extensive assortment of gas burning appliances for heating and cooking purposes a new line of Jewel gas ranges. At present two styles are being manufactured, one of which is intended for using natural gas and the other for artificial gas. The latter style is known as No. 363, and is represented in general view in Fig. 1 of the accompanying illustrations. It has four burners in the top surface, two lids over the water back and a griddle cake baking plate with reversible burner.



New Jewel Gas Stoves.—Fig. 1.—Gas Range No. 363.

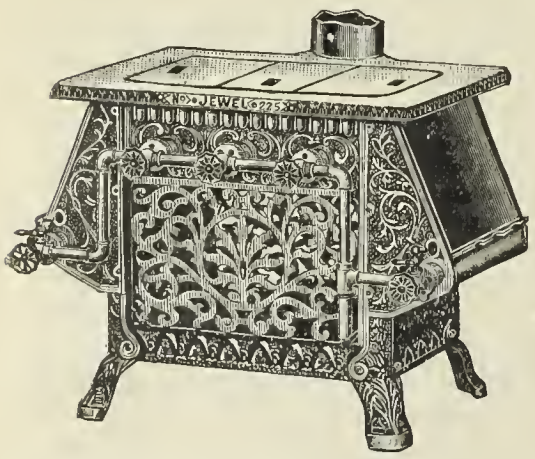


Fig. 2.—Jewel Laundry Stove with Iron Heating Devices.

There is also a broiling chamber, a baking oven and a roasting oven, the base of the latter being made removable. The decorative features are of an effective character and the construction is first class throughout. Another novelty which the company have this season added to their assortment is shown in Fig. 2. This is the Jewel laundry stove of a hight just right for a wash boiler, the top being large and furnished with three removable solid lids. The heat is furnished from three No. 10 burners directly under the lids referred to. Upon each side is constructed an iron heating device having a No. 10 burner inclosed, these burners being lighted with a pilot light. The flame of the iron heating burners plays against the slanting top of the plate, giving, it is said, very satisfactory results in operation. Each side has a capacity for three irons, the ledge at the base which holds the irons having openings to receive the points of Mrs. Potts' and similar irons. The Jewel laundry stove is constructed of cast iron throughout, has a top surface 24½ x 18¼ inches, a top opening 18 inches wide by 12 inches deep, and an iron heating plate 13¼ inches wide by 9⅛ inches high. The extreme width of the stove shown in Fig. 2, including the iron heating wings, is 29 inches. The manufacturers furnish one style of this stove without the side heating attachments. The company refer to these stoves as being useful for many other than laundry purposes. They have also brought out a new line of Junior stoves made in three styles and with six different arrangements of burners, one of which is shown in Fig. 3 of the cuts. These are offered under the name Jewel and are 22 inches wide by 22½ inches deep and 5 inches high.

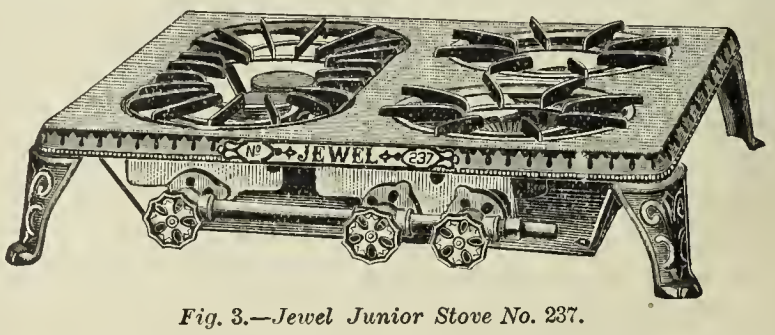


Fig. 3.—Jewel Junior Stove No. 237.

Guardian Fire Extinguisher.

The accompanying cuts represent a fire extinguisher being put on the market by Randolph & Clowes, Waterbury, Conn. The vessel in which the fluid is held under pressure is a seamless copper shell, in sizes to suit, from 2 to 5 gallons. One of the special features in the extinguisher is the two separate and distinct methods of operation. One of these is an air pressure, which, it is stated, is automatic. The other, it is stated, is a never failing pump, which is auto-mechanical. If from any cause the air pressure should fail to throw the fluid, the pump can be called into use. The discharge pipe or tube, to which the hose is attached, and through which the fluid must pass, is a single, double acting piston pump, of the water packed piston type. It is explained that the mechanism of the pump is such that when the piston or handle of the pump is turned to release the pressure the same movement turns the receiving valve upon its seat once and a half around, so no time is lost. If the internal pressure of the



Fig. 1.—Guardian Fire Extinguisher.

compressed air is weak, or lost altogether, the necessary force is added by working the piston up and down a stroke of from 6 to 8 inches. The pump immediately fills and force is supplied, it is remarked, to throw a solid stream 40 feet. The pump is so constructed that the receiving valve is kept closed during any period of idleness. It is explained that, while the extinguisher stands ready charged for immediate action, the pump remains perfectly dry, and that should the extinguisher be subjected to a temperature cold enough to freeze the contents of the vessel, the pump will be found in working order, as there is nothing in it to freeze. The point is made that all important mechanical parts of the extinguisher are so arranged that they do not come in contact with the fluid until the extinguisher is in operation ; that the tank is so arranged that the compressed air is kept away from the fluid connection by casing it in a compartment by itself, and that the air pressure does not come in contact with any connection of the extinguisher. The manufacturers state that the fluid for extinguishing fires is a combination of chemicals furnished them by one of the most celebrated chemists of the country, that it will not deteriorate or become useless with age, that it will not corrode metal or stain the finest fabric, where the colors are

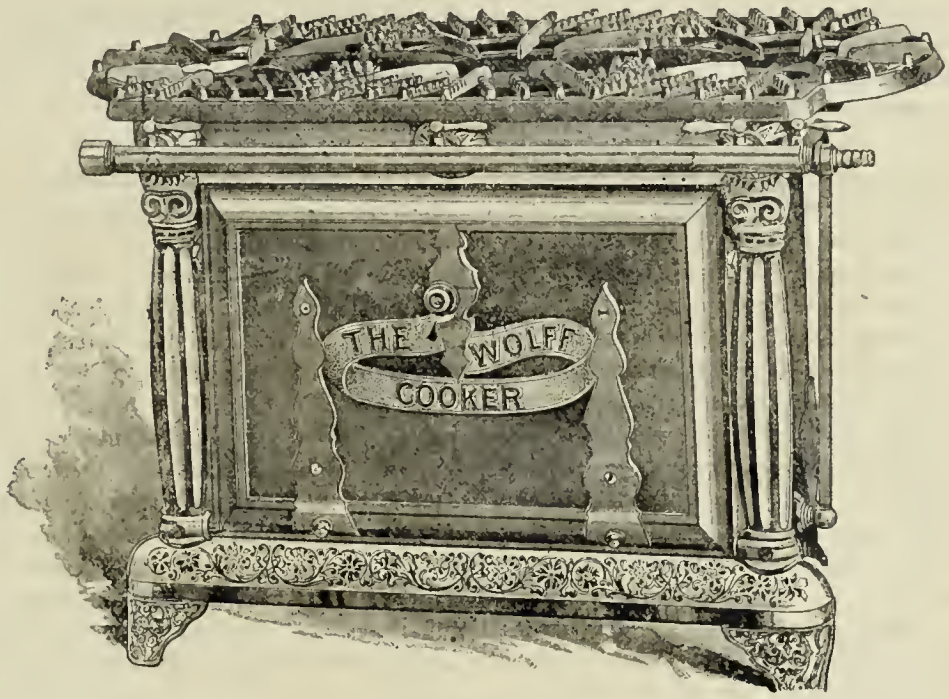


Fig. 2.—Guardian Fire Extinguisher with Gauge.

not fugitive, that the extinguishing qualities are exceptional and that by actual test it has stood a temperature of zero without freezing. The manufacturers furnish the compound in packages, securely packed for shipping, with directions for mixing it. A reliable pressure pump that will not rust or corrode is also furnished. The manufacturers claim that by repeated and expensive experiments they have produced a thoroughly practical and reliable fire extinguisher.

The Wolff Cooker.

A new candidate for favor with dealers in summer goods is the Wolff Cooker, made by the Wolff Gas Radiator Mfg. Company, 164 Franklin street, New York, and which is shown in the accompanying picture. The cooker is new in design and construction, being light in weight so that it may be easily transported, and is compact, so that it is capable of doing a great deal of work and occupying but a small space. There are three burners that may be used for cooking on the top, two for cooking exclusively on the top, and the third for broiling in the oven as well as cooking on top. This is a new application, and the construction is novel. The top of the range is well perforated to permit the heat of the burners passing up around all vessels which are set upon it, and is so constructed that vessels may be moved around upon it without lifting up. The broiler burner is placed under the center cooking hole and is of an oblong ring construction, the gas burning only on the inner side and under the fine fret work casting, which has projecting pins on the under side.



The Wolff Cooker.

This casting is heated red hot and radiates heat against the food to be cooked. On dropping down the oven door a rack is seen, which is placed in the upper part of the oven on which the broiler sits. Another burner of the same character as the cooking burners on the top of the stove is placed under the center of the oven, and it is said that the cooker is an excellent baker. The oven is 10½ x 16 inches and 10 inches in hight. The cooking burners and the burner under the oven are rated to burn 10 feet of gas per hour, the broiler burner burning 12 feet. All the burners are provided with an adjustable air mixer to meet the requirements of gas of different qualities and furnished at different pressures. The castings of the stove are of a fine finish and the body is constructed of Russia iron. All the castings on the front of the stove and the name plate are nickel plated, giving the stove a very attractive appearance.

MEMORANDA.

JEAN L. REED, representing the Rochester Stamping Works and the Robeson Cutlery Company, 141-147 Jones street, Rochester, N. Y., uses a black card, printed in gilt, bearing five verses of praise to the "Rochesters," referring to their line of goods. The card also bears a cut of a copper tea kettle, and allusion is made in the poetry to the many different household goods made of sheet metal by the firm.

IT IS NO UNCOMMON THING for stove dealers to receive curiously worded orders through the mail, but occasionally one is received of such a unique character as to make it more than ordinarily conspicuous. A stove firm doing business in one of the smaller towns in Maine recently had brought into their office by an out of town stage driver an order reading as follows: "ples geet me A wash bolar Ass cheep Ass you Can A bout 100 25 ore 100 50."

E. M. LAW of West Newton has bought A. H. Lyman's stove store, at Athol, Mass., and will continue the old business and add plumbing. He was formerly in Mr. Lyman's employ.

FRED D. HARRIS and his brother Edward H. Harris have formed a copartnership and will conduct a tin and repair shop on West Elm street, Oneida, N. Y. Edward H. Harris has been in the employ of Conley Brothers at their stove store on Madison street. The firm will make a specialty of furnace work.

A. P. BATEMAN, Winchester, Mass., continues to make improvements to the front of his tin shop store. He has built two large show windows.

THE BEARDSLEY MFG COMPANY, Cleveland, Ohio, distribute blotters advertising some of their specialties, which include fire shovels, Economic roasters, grain measures, flour measures, cans, tanks, kegs, &c. Several of the goods are illustrated on the blotters.

HORTON, GILMORE, MCWILLIAMS & CO , 172 to 176 Lake street, Chicago, have been appointed exclusive Chicago agents for the Meyers Putz Cream Liquid Metal Polish and the Putz Extract for polishing. These preparations have a worldwide reputation. The first named is not only designed for metals, but also for wood work and leather. The other is for all kinds of metals except silver ware.

L. & I. J WHITE, Buffalo, N. Y., have opened an office at 48 Centre street, New York, in charge of S. J. White. One of the walls of the office is decorated with a display of edge tools that was exhibited at the Paris Exposition; and the sign that was used over their exhibit is also an attraction in the office. Against a black cloth background in an oak frame of shield design edge tools of various descriptions are shown. They include ice axes, firmer and socket chisels and gouges, draw knives, butchers' cleavers and knives and ship carpenters' tools. Another piece of work on exhibition is a leather splitting knife blade 92 inches long, of superior cast steel and sharpened to a razor edge.

STOVE TRADE NOTES.

The Stove Secretaryship.

The leading members of the stove trade who take an active interest in the affairs of the National Association of Stove Manufacturers are realizing more strongly from day to day the loss sustained in the death of D. M. Thomas, the late secretary. His peculiar fitness for the position was, of course, recognized by the great majority of the members, as shown by the very cordial support which they gave him. Yet Mr. Thomas' warmest supporters now acknowledge that even they fell short of measuring him at his true worth. The best evidence of his superior qualifications is the fact that so far no candidate for the succession has been brought forward who commands any considerable following. Names have been mentioned in connection with the place, but thus far there has been no crystallization of sentiment in favor of any of them. Available men who can satisfactorily fill the position of secretary of the National Association may be found without a very prolonged search, but the great difficulty encountered is in getting a man who can at the same time take up the extremely important work of the Stove Founders' National Defense Association. The two associations are not identical, although largely composed of the same individuals. For special reasons it is desirable that the same person should serve as secretary of both associations. In the case of Mr. Thomas there was no thought of separating the work. He thoroughly comprehended the functions and the special fields of labor of both organizations, and to be elected secretary of one meant for him the secretaryship of the other.

In the discussions and correspondence upon this subject which have so far taken place among the leading members, several names have been suggested of persons who would admirably fill the position of secretary of the National Association. They possess the literary qualifications desirable for the incumbent of this office, and some of them have such attainments of a very high order, which would make them in this respect worthy successors of the deceased secretary. They are also familiar with the commercial side of the stove business, and would by their originality and great mental force assist materially in making the annual conventions interesting and instructive. They would be able to extend the membership of the organization by the persuasive powers with which they are gifted, and their tact would soften antagonisms and prevent misunderstandings. But, thus far, no one in a position to accept the secretaryship has been brought forward who combines with all these qualifications the practical knowledge of stove molding which he must possess in order to successfully conduct the work of the Defense Association.

This part of the secretary's work calls for very peculiar qualifications. The right man in this position can render inestimable service to the stove trade in arranging differences between manufacturers and their workmen, so that serious strikes are prevented. It is true that the other officers of the Defense Association are practical men, who are versed in all the technicalities of stove molding, and are therefore competent to adjust differences that may arise. They by no means abdicate their power in favor of the secretary and relegate to him all their functions. But they have their own business to manage, and cannot travel at a moment's notice to a distant town to hear the fine points of a controversy over the piece price to be allowed a molder for turning out some new shape of a stove part. This is the function of the secretary, and when he appears on the ground he must be so competent to judge the value of the work, and so able to prove the justice of his position, that his fairness will commend itself to both the contending parties. This involves not only the knowledge that comes of years of experience in running a molding shop, but also much hard study in becoming familiar with all classes of work, all varieties of stoves and the peculiarities of the several sections of the country. It is not every manufacturer who can dissect a range made near him with a similar one made 1000 miles away, and fix a fair molding price on every piece of the latter in compliance with all usages which have grown into the trade in the section in which the second range is being turned out. But it would be well if the secretary could do so. He would be a tower of strength to the manufacturers, as he would surely gain the respect and admiration of the workmen, who are intensely jealous of their rights, but are usually quick to acknowledge the justice of a perfectly fair proposition.

The task of selecting a secretary is thus shown to be extremely difficult. Yet the qualifications are not rare in the stove trade. Quite a number of men could be designated any one of whom would make a very capable secretary. But they are not available, being so situated that the office has no attraction for them. The problem is to find an available man with the necessary qualifications. As the time for the annual convention is approaching this is a question of very great interest to the stove trade, and therefore one which many of our readers would be pleased to have an opportunity to discuss. They may have candidates whose names they desire to bring to the notice of the trade. We shall be glad to print communications on this subject.

Foundry Mixtures for Stove Castings.

The following interesting letter discussing the question of foundry mixtures that appeared in *The Metal Worker* March 16 is sent us by C. A. Meissner of Birmingham, Ala.:

I note a letter in a recent issue in which a foundry manager complains of a certain mixture as not having given good results. He says this mixture was:

39 per cent. No. 2 Foundry, Southern pig.
38 per cent. No. 3 Foundry, Southern pig.
16 per cent. No. 1 Soft, Southern pig.
7 per cent. Jackson County Silvery, 8 per cent. silicon.

With this he used his own scrap, also 30 pounds limestone per charge. He states resultant iron is very dirty and "rusty," that it cannot be skimmed clean, that the rust gets into the molds and makes mean looking castings, and asks opinions of others as to what is the trouble and how to overcome it.

Would you pardon me if I make a little good natured criticism? Our foundry friends make it often a very difficult task for the furnacemen and chemists to help them out of their troubles, from the fact that so often they forget to give them the very data which are absolutely essential to a study of the difficulty. We have here the percentages given, and that is all. There is no intimation as to what section this Southern iron comes from—Virginia, Tennessee or Alabama—which might be a guide to the nature of the iron. There is no analysis of the iron given except the Jackson County, without which we can hardly reach an intelligent conclusion, and he does not state the amount of scrap used nor the nature of the coke, both of which are important items. I do not want to find fault in any way, but merely call the attention of our foundry friends to the need of being a trifle more specific when such matters come up, and I am sure there are plenty of men all over the iron districts who can very quickly give them a clear idea of where the trouble is to be looked for.

As I am reasonably familiar with Southern and Northern irons, permit me to make a rough guess at his troubles and give my reasons for it. I think his mixture is too soft, too high in silicon and probably too high in phosphorus. Every iron he has there is liable to be a high silicon iron, as almost all South-

ern coke irons, except from the brown ore fields, tend to be soft and fluid rather than strong, and even those of the brown ore districts share this property to a large extent.

Take the average Southern iron and analysis will be about as follows:

	Per cent.
No. 2 Foundry, silicon	2.25 to 2 60
No. 3 Foundry, silicon	2.00 to 2.400
No. 1 Soft, silicon	2.75 to 3 75
Phosphorus will average from	0.450 to 0.700

The Jackson County iron will probably run 1 per cent. in phosphorus.

To this he adds his own scrap, which, if made from repeated charges of this mixture, will naturally be high in silicon and phosphorus, and he apparently has no strengthener whatever in his mixture. Of course some of his Southern iron may be a low silicon and phosphorus brown ore iron, in which case the above does not hold altogether good; but even then I should say that he had no need for the Jackson County Silvery, in so far as his Southern No. 1 Soft would be bound to take care of any other Southern iron he could get and give necessary softness and fluidity. Therefore my judgment would be that for his purpose, stoves, he should leave off the Silvery iron and try the mixture without it. If he uses no strong Southern brand—but they are all high silicon and high phosphorus—he could readily buy a strong Southern iron from any of the Southern companies by specifying his needs, for all of them are now going into the matter of analysis most earnestly and are able to meet any such demand, as they all carry strong iron as well as soft iron in their yards.

It may be interesting to note the probable average of this mixture in silicon and phosphorus, based on actual averages of Birmingham iron:

	Silicon. Per cent.	Phosphorus. Per cent.
39 per cent. No. 2 Foundry	2.40	0.550
38 per cent. No. 3 Foundry	2 25	0.550
16 per cent. No. 1 Soft.	3.25	0.550
7 per cent. Jackson County Silvery	8.00	1.00

This would give a mixture of 2.87 per cent. silicon and 0.581 per cent. phosphorus, which with probably high silicon and phosphorus scrap would be liable to make a mixture entirely too rich for his use and cause his troubles.

From HENRY HEYER, Capital City Stove Works, *Columbus, Ohio*—In my opinion, the correspondent who wrote *The Metal Worker* March 16 asking for information about foundry mixtures is using too much limestone. I use only from 6 to 10 pounds per ton of iron as a flux and with good results. I use only Frick's coke. I have used several kinds of coke, but find that is the best in the long run. I would furthermore suggest to your correspondent to cut the No. 3 Southern 18 to 20 per cent., and add this 18 to 20 per cent. to No. 2 Southern. I do not put much faith in No. 3 Southern foundry iron for stove plate, although some may have had good results with it. If these suggestions do not help your correspondent I will be glad to give him my mixture if he will apply for it.

A Pennsylvania correspondent, noticing the article on foundry mixtures for stove castings in *The Metal Worker* of March 16, says: "It is difficult to comply with the request made, as there is but little ground to work on. It is evident that some iron that should not be used is in the mixture, and the proper thing to do would be to get a chemical analysis of each iron used. There are Southern irons which in the pig look first class in every respect, but when used look similar to silver gray and have given our foundrymen considerable trouble. The usual method of getting over the trouble is to drop the iron which causes it out of the mixture altogether. There is no reason why any silver gray iron should be used if the other irons are all right. There is no trouble whatever in getting a first-rate mixture for stove plates with three irons, and a mixture that will run soft, strong and fluid. Such a mixture can be secured with only 3 per cent. of silicon instead of 8 per cent."

A Furnace Association Needed.

Chicago furnacemen state that the furnace trade of that city is in a deplorable condition. Manufacturers and representatives of other manufacturers have been waging relentless war upon each other until prices have been so seriously cut that ruin seems to be inevitable if a change is not speedily made. The prices at which heating contracts have been recently taken are so absurdly low that they almost challenge one's credibility. It would perhaps unduly demoralize business in other sections to quote them. It is enough to say that the whole work of installing a furnace system in an eight-room house is now done for the price of the furnace alone two years since. It is by no means unusual for a conscientious furnaceman to find that the competitor who captured a job was from 20 to 33⅓ per cent. cheaper. The difference is so great that arguments as to character of work, efficiency of apparatus, safety from fire, &c., have little weight in influencing owners to reject the lowest bidders and take one of the dearer ones.

It follows as a matter of course that these very low prices mean inferior work. The furnaces cannot be properly made, the roughing in cannot be done with the necessary precautions against danger from fire and all the work must be done hastily and in the most slighting manner. Reductions in cost of material have been considerable within two years, it is true, but they have by no means been so great as to cause the difference prevailing between prices now and then. Furnacemen who expect to do good work confess their utter inability to meet the conditions existing round them. They are of the opinion that the only remedy for this state of affairs is the formation of an association of the manufacturers and manufacturers' representatives in and about Chicago to maintain fair and equitable rates on their furnaces and to control, as far as they can, the reckless bidding on contracts.

It is to the interest of furnace manufacturers to discourage these extremely low prices and not to countenance them by making special concessions at the solicitation of those contractors who can only secure jobs when they are lower than any one else. It is no credit to a manufacturer to have his name on a furnace forming part of a poor heating system, because the first part of a heating job to be attacked when it fails to give satisfaction is the furnace. A few furnaces of a particular make thrown out in one neighborhood may mean the loss of all patronage in that locality for many years.

An organization of furnacemen would undoubtedly be found of much benefit in correcting disturbances of this character, because men cannot get together and talk over business matters without making an impression on each other in the direction of greater consideration and fairer treatment. Perhaps in no other branch of business to-day is there such a total lack of intercourse and complete disregard of each other as in the furnace trade. Every other line has its national or local organizations which bring the members together at stated periods, but the furnacemen go their several ways as though contact with one another was to be especially avoided. Can they not be brought together?

The Oil Stove Market.

In the old buildings of large cities, which are generally well populated, the heat attending the use of coal for cooking in summer brings a desire for something less heating. Frequently these buildings are not piped for gas and the insurance interferes with the use of gasoline. This is no small market and the oil stove at present seems to monopolize the trade, though patented fuels have had a passing favor. The old stove of the past is barbarous compared to the clean, convenient, easily manipulated, high power oil stove of to-day, which holds its own in the line of progress. The modern oil range is attractive in appearance and is found in the suburban districts in the kitchens of many who are well to do, as it is capable of meeting all the requirements imposed upon it. The kitchen is by no means its only field, for when the heating stove in many shops is dispensed with the oil stove is relied upon to furnish the heat required for a myriad of purposes. The fuel being inexpensive and the heat readily controlled the oil stove in all thickly inhabited districts is destined to play an important part.

H. WATERMAN, manager of the New York house of the Cleveland Foundry Company, 107 Beekman street, is distributing among the trade a catalogue devoted to gas and oil cooking stoves.

FRANK P. GLAZIER of the Glazier Stove Company, Chelsea, Mich., is the assignee of a patent recently granted to A. R. Welsh of that place for certain improvements in oil stoves. The invention consists in the peculiar construction of the base and of the drip pan and its support. The arrangement is such that the ordinary roller base, usually employed where a drip pan is used, is dispensed with. The claim is made that the construction employed is very simple and cheapens the manufacture of such stoves.

Electric Cooking.

English electricians deserve much credit, says the *Despatch*, for the practical way in which they have solved many of the problems arising out of developments in electrical cookery. A well-known writer on the chemistry of cooking has given it as his opinion that the perfect arrangement for an oven would be the radiation of its heat from all sides. This is now done in an electric oven which is having a large sale in London.

The process is said to produce a cooked meat that is absolutely wholesome and extremely appetizing. There is no combustion whatever in the oven, and the food, being cooked in a pure atmosphere, cannot possibly be tainted. The heat is turned on at any part merely by the movement of a switch. It is produced in ide the oven, and is so conserved that after the oven is once made hot, what is requried to carry on the process is little more than that sufficient to make up for slight leakages. The electric oven can be put on the kitchen dresser when needed, and it throws off, practically, neither heat nor smell.

Tabulated lists are provided from which, the weight and description of the joint being given, full instructions are derived as to the time and temperature of the required cooking. Roast mutton takes a temperature of 330° F., beef 340° and veal 350°; and a heat of 370° is needed to give puff pastry its desirable tint and consistency. The comparative coolness of the outside of the oven is a singular feature; as a *chef* remarked at a recent dinner: "You could sit on the oven while you roast inside."

ODD PLATES.

A. Weiskittel & Son of Baltimore, Md., are favoring their friends in the trade with a very attractive poster, which shows some of their leading specialties. The central feature of the design, which is lithographed in colors, is a kitchen interior, showing a Fire King cabinet gas range in operation. In the upper right hand corner are vignettes of a two burner hot plate and gas broiler, while in the lower left hand corner is a four-tube gas radiator and an open fire place fitted with a gas log. There is also shown a bird's eye view of the works of the concern named. The make up of the poster is rich and effective, and when displayed in the store of the dealer cannot fail to attract attention.

The Danville Stove & Mfg. Company, Danville, Pa., are about placing on the market a hot plate for gas in three sizes, a line of cheap furnaces and also a four-hole range in two sizes under the name of the Model Beaver.

A communication was received recently by a manufacturer of gasoline stoves from a consumer who had used a stove of their make for several years, in all seasons, for cooking. It contained the remarkable statement that during the period of the coldest weather we have experienced this winter his fuel bill for cooking for a family of five persons was but 15 cents per week.

The Carton Furnace Company of Utica, N. Y., have just completed their new foundry building, which stands upon the site of the one that was damaged by fire about five weeks ago. The new structure is 54 x 90 feet in size, half of the building being two stories high and fire proof throughout. The structure is of brick with a truss roof, the doors being fire proof and the shutters covered with tin. The interior is lighted from both sides as well as from a skylight. These dimensions are considerably in excess of those of the old building and give additional molding accommodations for 10 men, making 55 in all. The cupola is 16 x 54 feet and the equipment throughout is of the most modern type. The plant is now running with a force of 125 men. The cost of the rebuilding and improvements is said to reach nearly $10,000, and to accomplish so much work in such a short space of time is a credit to the enterprise of the management. The work was done under the supervision of John B. Jones, the secretary of the company.

The A. J Lindemann & Hoverson Company of Milwaukee, Wis., have recently issued from the press an illustrated price-list of stoves and sheet metal goods which they manufacture. The little volume consists of 64 pages, profusely illustrated, and is bound in colored paper covers with gilt side title. Since the last catalogue was issued the company have nearly doubled their facilities for manufacturing gas and gasoline stoves and their entire line has received many additions as well as improvements. The opening pages are given up to the L. & H. Juniors, shown in a variety of styles and sizes; after which we find the L & H. single generator cabinet stove; the L & H. Ideal, shown with and without step, and the L. & H. Process, an illustration of which appeared in these columns not long since. The latter portion of the catalogue considers the L. & H. Grand Cabinet ranges for burning gas; the L. & H. Gem, together with lamp stoves, ovens, oil heaters, torches, elbows, coal hods, stove pipe, &c.

The Plymouth Foundry Company of Plymouth, Mass., have issued from the press an attractive catalogue of 48 pages illustrating the leading specialties they manufacture. The Plymouth range is made in 70 different styles and sizes and is adapted to meet all reasonable requirements. The catalogue also gives attention to the Crown Royal six-hole range. made in several styles and sizes; the Royal Grand, a first class construction embodying the modern features; the Art Royal, the Prize Royal and the Dexter ranges. The heating stoves are represented by the Royal Grand square parlor heater, the Art Royal sheet iron cylinder surface burner, the Prize Royal, the Plymouth Parlor, the Champion, a neat wood box stove, and the Radiant, a cheap cannon. In the opening pages of the catalogue there is a brief description of Plymouth Rock, the National Monument to the forefathers, Pilgrim Hall and the plant of the Plymouth Foundry Company.

Probably the largest single shipment of oil cook stoves ever made in this country was that recently sent out by the Novelty Mfg. Company of Jackson, Mich. The train consisted of 15 freight cars, the goods being consigned to Butler & Johnson of Syracuse, N. Y. The firm named removed only one carload of the stoves to their own warehouse, the remainder being reshipped to customers throughout the State. W. B. Johnson of Butler & Johnson stated to a representative of a Syracuse paper that the consignment mentioned would not be sufficient to meet their season's requirements, and that he expected before August 1 to receive at least 25 additional carloads. It is stated that last season the firm sold something over 15 carloads, and the demand this year is far ahead of that a year ago.

Luther & Lederhos, 9-11 Desbrosses street, New York, are issuing to the trade their spring catalogue for 1895. It contains 28 pages devoted to gas and oil cooking appliances Some new sizes have been added to their Enterprise cabinet gas range, some sizes of which are made with gas water back. This is followed by several pages devoted to gas hot plates, the newest being made with two, three and four burners setting up on high feet. They also show a gas water heater to be used in connection with kitchen boilers. These are followed by some tailor and laundry stoves and a plumbers' solder furnace, several pages devoted to oil stoves of different character, and a line of Enterprise lamp stoves. The last pages in the book are devoted to gas stove appliances and equipments.

The Cincinnati Steel Range & Furnace Company of 153 West Fifth street, Cincinnati, Ohio, have recently issued a circular letter to their friends in the trade in which attention is called to the lines of high grade kitchen outfits manufactured by them. These outfits are referred to as embodying the latest improvements and as being adapted for first class hotels, clubs, *cafés*, public and private institutions, &c. The outfits consist of Burton steel ranges, French broilers, steam tables, carving tables, plate warmers, coffee and tea urns, bake ovens, steam dish warmers, jacket kettles, cake griddles, waffle and laundry stoves, copper ware, &c. These goods are constructed in a substantial manner according to the most approved plans and the manufacturers state that they are prepared to furnish complete kitchen outfits and guarantee entire satisfaction in all cases.

J. D. Marvin, the New York representative of Rathbone, Sard & Co., at 254 Water street, New York, has a "Snap" which he hopes will become popular with the trade. Those who are interested in an up-to-date summer range should stop in to see it.

Hugh Davidson has accepted the position of foreman of the Clinton Foundry of Fuller & Warren Company, at Troy, N. Y., to succeed the late John Thompson, who died recently. Mr. Davidson has for 25 years been foreman of the Empire Foundry, and is in every way competent for his new position.

The Excelsior Steel Furnace Company, manufacturers of furnace fittings, are now occupying the entire building at 38 West Monroe street, Chicago. Their business has grown remarkably during the short time that has elapsed since its establishment. The building occupied consists of six floors in addition to the basement, each 44 x 204 feet, giving over 60,000 square feet according to the usual floor space occupied. But even this is not sufficient to provide the company with all the room needed, and they have been obliged to build galleries on several floors for the purpose of arranging bins to store their enormous stock of furnacemen's supplies. The visitor to the establishment is surprised to find how carefully every cubic foot of space has been utilized, but in looking over the stock he speedily realizes that it is essential in order to successfully conduct a business which comprises so many details. From basement to top floor the most perfect system obtains. In the basement are stored furnaces

cast iron radiators and other heavy goods. Here also are machines for working on heavy steel plate for the various parts of the Excelsior steel furnace. In the rear is a circular saw, constantly occupied in sawing lumber for crating. This lumber is cut exactly to the inch for making the numerous sizes of crates required. It is then elevated to the shipping floor and each size is separately stored in a labeled bin, so that the packers have no cutting or fitting to do in preparing goods for shipment. The upper floors are devoted to light manufacturing and storage. Special trucks or cars have been devised by which large quantities of goods can be easily shifted from one place to another, or removed to the shipping floor by either of the two elevators with which the building is supplied. The company are large consumers of tin plate, constantly carrying thousands of boxes in stock. They sell tin plate as well as furnace fittings, furnaces, steam and hot water radiators, &c.

An annex of the Chelsea Stove Works, Chelsea, Mich., owned and operated by F. P. Glazier & Co. as a tin shop, was destroyed by fire on Tuesday, together with a large portion of its contents.

Articles of incorporation were recently filed in the office of the Secretary of State at Columbus, Ohio, by the Monroe Stove Company of Mansfield, the capital stock being placed at $25,000.

We quote the following from a letter recently received from a furnace manufacturer: There is no doubt in my mind that more attention in the future will be given to improving and perfecting the hot air system, for the reason that purer air is obtained by it than with steam or hot water heating, unless indirect radiation is resorted to. This, however, is expensive to put in and expensive to run, and it requires a skilled man to handle it to avoid accidents. It is my belief that if first class hot air furnaces of sufficient size were always used instead of small, insufficient, cheap heaters, hot water and steam would be but little employed.

At a recent meeting of the stockholders of the March Brownback Stove Company at Pottstown, Pa., permission was granted the directors to lease or sell the property of the company at 3626 Powelton avenue, Philadelphia. At this meeting officers and directors were elected, the latter consisting of James Brownback, James Rogers, T. J. March, H. M. Ebert, Franklin March, A. K. Shaner, H. G. Kulp and John H. Towers The officers elected for the ensuing year are James Brownback, president; James Rogers, vice-president; T. J. March, treasurer, and H. M. Ebert, secretary.

The Weir Stove Company of Weir Village, Mass., have been making some improvements in connection with their plant, and among other things are putting on a new roof to one of their buildings.

It is stated that the Lebanon Stove Company of Lebanon, Pa., recently took an order from a New York concern for 200 gas stoves. If the goods prove satisfactory it is intimated that a large order will result.

L. B. Jones, successor to the Security Gas & Vapor Stove Company, St. Louis, Mo., reports a large demand for their Independent Barbecue broiler, which can be attached to coal ranges and makes a summer and winter broiler. Janes & Kirtland, New York, who are Eastern agents for the sale of these broilers, are attaching them to their B. B. ranges, and report that they are giving excellent satisfaction.

The Front Rank Steel Furnace Company, St. Louis, are sending out to the trade an illustrated catalogue describing the Mouat hot water heater, for which they are sole agents. This heater is referred to in the catalogue as being the most powerful, economical, durable direct circulator of hot water in the market. The catalogue contains engravings of a number of churches, residences, schoolhouses, &c., which are heated by the Mouat heater. In addition to this the catalogue contains cuts of the heater with sheet iron jacket and heater set in brick work; also side view showing circulation, construction, &c. The catalogue is handsomely printed and will be sent to the trade on application.

Henry Bartholomai, for nearly ten years past foreman of the foundry of the Enterprise Stove Company, Vincennes, Ind., committed suicide on March 16 while temporarily insane. He had complained of feeling unwell for two weeks or more, but no serious thought was given to it for the reason that he continued to perform his duties as usual. On Saturday morning he left home at 6 o'clock to open the foundry, and was found dead a half hour later. He was 45 years old, had always lived a strictly temperate and upright life. He leaves a wife and seven childen, who have the sympathy of the entire community in their sad bereavement.

W. H. Martin, Chicago manager for the Peck-Williamson Heating & Ventilating Company, has removed his office and salesroom temporarily to room 1 at 59 Lake street, Chicago. After May 1 he will be permanently located in another part of the same building but with entrance at 41 State street.

The Sanitary Pressers' Association, composed of the workmen in the sanitary potteries at Trenton, N. J., have decided to accept a new wage scale, which reduces the rates paid a year ago from 33⅓ to nearly 60 per cent. This action is the result of a war begun at the end of last summer between the Trenton Potteries Company and the factories outside the sanitary ware syndicate, as a result of which the selling prices were reduced between 50 and 60 per cent. Wares were, for a time, sold at practically less than the cost of manufacture. The reduction accepted by the Trenton workmen will, it is believed, compel the closing of nearly all the Western sanitary potteries. The new wage schedule comes into effect on Monday, when the men will return to work after a long period of idleness.

Forty potters at the Great Western Pottery, Kokomo, Ind., went on strike on Monday on account of a reduction of 15 per cent. in wages. The company claim that all the Eastern potters have made a cut and that they are compelled to do the same or go out of business. It is expected that the reduction will probably stand.

The lead works of Tatham Bros., 224-226 South Fifth street, Philadelphia, were damaged by fire to the extent of $3000 on March 22.

SCRAP.

J. H. Rogers, managing partner of E. Morewood & Co. and the Swansea Tin Plate Company of Wales, arrived at New York last week from England. Mr. Rogers is now visiting the works of the Morewood Company, at Gas City, Ind.

Work on the new tin plate factory recently located near Frankton, Ind., will, it is announced, be begun at once. The plant will probably be ready for operation about October 1.

N. & G. Taylor Company, Philadelphia, contemplate erecting an addition to their works during the coming spring for the production of continuous roofing terne. The company began the manufacture of this material during the past year and are now turning it out with great success. They are also arranging for the production of large tinned sheets, which they expect to able to place on the market at a lower price than that now asked for this material by foreign manufacturers.

The American Tin Plate Company, Elwood, Ind., find plenty of work for the recent addition to their plant. Their mills are reported as running to full capacity, turning out about 6000 boxes of finished plate every week.

On Tuesday, March 19, in the presence of a large number of townsfolk, the new plant of the Montpelier Steel & Tin Plate Company of Montpelier, Ind., was opened, to the strains of music from a band composed of workers in the mill. The first sheet was rolled by Harry Herbert, the superintendent, from fine open hearth steel, the operation being a complete success. The mill is now running regularly night and day and turning out some 30 tons of black plates of excellent quality daily. The equipment of the works consists of 6 Totten & Hogg hot and 6 cold mills and 12 tinning sets. Two of the mills are not yet completed, but will be in operation shortly. Several grades of tin and terne plates will be produced. The works will employ over 200 hands. The office of the Montpelier Steel & Tin Plate Company is in the Board of Trade Building, Columbus, Ohio.

We are indebted to Bruce & Cook, 190 Water street, New York, for a copy of the second edition of the valuable table of net weights of tin plates, distributed by the firm with their annual calendar, and which was reproduced in *The Metal Worker* of January 12. To the original table has been added in this edition the net weights of wire gauge D plates, and also taggers iron and tin.

The construction of the tin plate mill of the Laughlin Nail Company at Martin's Ferry, Ohio, is progressing satisfactorily, and the works will, it is expected, be in operation by June 1. The plant will consist of four hot mills and three cold mills, with accompanying tinning sets. The output of the concern will include charcoal and coke bright plates, as well as roofing ternes.

The plant of the Crescent Sheet & Tin Plate Company, at Bessemer avenue, Cleveland, Ohio, will be completed and ready to run about May 1. Buildings and power are provided for six hot mills and ten tinning stacks. The start will be made with four hot mills, two others and the tinning department to be added in the course of the summer.

THE TIN PLATE DEPARTMENT of the Old Dominion Iron & Nail Works Company, Richmond, Va., is now in active operation, turning out a full line of bright and roofing plates. The company contemplate building a four mill black plate plant in the near future.

THE ÆTNA-STANDARD IRON & STEEL COMPANY of Bridgeport, Ohio, expect to have their full complement of eight tin mills in operation by April 1. A large addition which they are making to their tin house equipment will be ready by the middle of that month, by which time the works will possess a materially increased capacity for production.

PREPARATIONS are now being made by the Atlanta Steel & Tin Plate Company, Atlanta, Ind., for an addition of 175 x 80 feet to their main building, in which will be placed three additional tin mills and a bar mill, making their works a six-mill plant.

THE report is given out that Sydney W. Bypass and Robert Sirvin, two English capitalists, have been visiting Sharon, Pa., with the object of locating there or elsewhere in that section a large tin plate works, to be erected in the near future

THE MILLS of the Somerton Tin Plate Works, Brooklyn, N. Y., have been running full, on three shifts, since November last.

THE PLANT of the Beaver Tin Plate Company, Lisbon, Ohio, is fast nearing completion, and is expected to be put in operation by April 10. The company have four tin mills and eight tinning sets. They propose producing both charcoal, coke and terne plates.

THE TIN PLATE PLANT of Marshall Bros. & Co., Philadelphia, is running full, turning out their well-known brand of Penn Treaty, charcoal, coke and terne plates, for which they find an increasing sale. An additional tin mill is in course of erection, which will make a total of five in all.

THE TINNING DEPARTMENT of the American Stamping Company, Brooklyn, N. Y., has been shut down indefinitely.

THE BALTIMORE IRON, STEEL & TIN PLATE COMPANY, Locust Point, Baltimore, Md., advise us that their mill, which has been closed down since October 6, will start up on April 1 after considerable enlargement and improvement.

THE WORKS of the Ellwood Tin Plate Company, Ellwood City, Pa., are now in full operation with four tin mills and eight tinning sets. The company are producing a line of four grades of bright charcoal plates, a brand of coke tin and five brands of roofing plates.

AFTER SEVERAL MONTHS of labor troubles the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., have their works now running to full capacity. They advise us that they are now in a position to regularly supply the trade with their well known brands of bright and terne plates.

THE MORTON TIN PLATE COMPANY, Cambridge, Ohio, have had their three black plate mills in regular operation since January 1, with every success. They have now started their dipping works and have commenced the production of tin and terne plates.

GUMMEY, SPERING & CO., Philadelphia, report an improvement in the demand for their brands of tin and terne plates. Their Pennsyl Old Method roofing plates, they state, are in particularly active demand. These plates they guarantee to contain 45 pounds of coating to every box of 112 sheets, 20 x 28, which it is claimed is all any plate will hold. Their Alderley roofing plate is increasing in popularity, and the reports concerning their Gummey Anti-Pinhole bright tin plates are most satisfactory. These plates, the firm state, are made in the old-fashioned way from Swedish bars hammered out, and the process of manufacture is so slow that four boxes only per day are turned out. They are largely used for making tinware required to stand long service, such as hotel ware. Phœnix is the name of an imported brand of bright plates sold by the firm, and it is claimed that they are the heaviest coated of any coming to this market. The firm have a good stock of plates of all kinds on hand at their store, there being upward of 1000 tons in sight on their main floor. There is also a stock of about 200 tons of galvanized iron on the same floor.

THE HENDERSON TIN PLATE COMPANY'S tinning plant at Norristown, Pa., has been sold out to a new concern, who have commenced business under the name or style of the Filley Tin Plate Company. The new concern enter the market with seven brands of terne plates and four brands of brights. The terne brands are Filley Old Style, Filley Roofing, Fidelity, Champion, Union, Victory and Admiral. The brands of charcoal brights are Radiant and Adonis, and of the coke brights Hero and Ella.

THE OHIO RIVER SHEET & TIN PLATE COMPANY, composed principally of former employees of the United States Iron & Tin Plate Mfg. Company at Demmler, Pa., have been organized, and will erect a tin plate plant at Remington Station, on the Pittsburgh, Fort Wayne & Chicago Railroad, near Rochester, Pa. It will be a two-mill plant, and the contract for the erection of one stand of roughing rolls, two 24 x 32 inch hot mills and two 22 x 34 inch cold mills has been placed with the Leechburg Foundry & Machine Company, Pittsburgh, Pa. Alexander Saulters is president of the new concern. The Leechburg Foundry & Machine Company shipped last week four cold mills to the La Belle Iron Works, Wheeling, W. Va., one Mesta patent pickling machine to the Pennsylvania Tin Plate Company, New Kensington, Pa., and another to the Crescent Sheet & Tin Plate Company, Cleveland, Ohio.

JOHN S. TREGONING of J. S Tregoning & Son, owners of one of the largest tin plate works in South Wales, announced lately that their plant at Morfa was shut down indefinitely, and would not run again until the condition of things in South Wales was much improved. Messrs. Tregoning's works have been running continuously for more than a generation, and the majority of their work people have grown up in them, some having been in the service of the firm for over 40 years. This action, which has been forced on the firm by the present condition of business, means absolute ruin to many of these people, who are fit for nothing outside the tin plate trade. This is only one of many similar cases in the Welsh tin plate districts, where the distress among this class of labor is very keen and the prospect of relief exceedingly remote.

RECORD MFG. COMPANY, Conneaut, Ohio, are able to report extreme activity in their tin plate manufacturing department. The company are turning out bright charcoal and coke plates.

A REPORT from Elizabeth, N. J., states that a company, to be known as the Elizabethport Tin Plate Company, have been organized at that place, with a capital of $150,000, to manufacture tin plate in the plant formerly owned by the Morewood Tin Plate Company, on Staten Island Sound. The property, which covers three acres of ground, has, it is said, been bought from the Morewoods by the new concern, who will increase the capacity of the works. H. Pritchard is named as general manager, and the date given for the beginning of operations is June 1.

THE FRANK KNEELAND MACHINE COMPANY, Pittsburgh, Pa., have completed and shipped all the mills and shearing machinery for the Pennsylvania Tin Plate Company, New Kensington, Pa., and the Crescent Sheet and Tin Plate Company, Cleveland, Ohio, both being four-mill plants. They have also recently shipped the shearing and tinning machinery for the new plant of the National Tin Plate Company, Anderson, Ind.

CONTENTS.

Editorials:	PAGE.
The End of a Strike	31
Why It Failed	31
Some Signs of Improvement	31
Church Heating Plants	31
The Letter Box—	
Are Gravel Roofs Durable?	32
Mending a Boiler. Illustrated	32
Lining Tanks with Lead	32
Collapsed with a Vacuum Valve	33
Inside Cold Air Duct	33
An Engineer's Education Wanted	33
A Detail of Construction	33
Quality of Tin Roofs	33
Sheet Metal Launch	34
Is Trap Ventilation Necessary?	34
Trouble with Furnacemen	34
Boiler Siphons	34
A Peculiar Furnace Experience	34
Which Is Best for Furnace Tops?	34
Plumbing and Gas Fitting—	
Open Work Fixtures	35
The I X L Vent Cap. Illustrated	35
Sanitary School Buildings	35
Niagara Injector. Illustrated	35
A Unique Gas Fixture. Illustrated	36
Thawing Frozen Pipes with Electricity.	36
Cleaning Solder	36
Suit for Defective Plumbing	36
Toronto Master Plumbers	37
The Report of the Essay Committee	37
Traps and Vents	37
The Quick Meal Balance Door. Illus	38
Air Blast Apparatus. Illustrated	39
Steam and Hot Water—	
An Unusual Combination System. Ill.	40
The Lily Steel Hot Water Heater. Ill.	42
Ventilation	42
Heating Notes	43
Roofing and Cornice—	
Tower Work in Copper. Illustrated	44
Slate for Roofing	45
The Roofer	45
Sheet Metal Ornaments. Illustrated	46
Flashings	46
Heating and Plumbing—New Work and Contracts	47
The Retail Store—	
New Jewel Gas Stoves. Illustrated	48
Guardian Fire Extinguisher. Illus	48
The Wolff Cooker. Illustrated	49
Memoranda	49
Stove Trade Notes—	
The Stove Secretaryship	50
Foundry Mixture for Stove Castings	50
A Furnace Association	51
The Oil Stove Market	51
Electric Cooking	52
Odd Plates	52
Scrap	53
Trade Report—	
The Iron Market	55
Metal Market	55
Chicago Report	56
Trade Notes	56
Condition of the Hardware Trade	56
Notes on Prices	56
Metal and Miscellaneous Prices	58
Labor Exchange	
Help and Situations Wanted	60

TRADE REPORT.

The Iron Market.

The official announcement that the price of Connellsville furnace Coke is to be $1.35 per ton at oven has removed a fruitful topic for guessing. The figure is higher than was generally believed probable and represents an advance of 45 to 50 cents. It is justified on the plea that the advance in wages demands it and that the Coke operators are tired of exhausting their property for the privilege of furnishing their customers material at cost or below it.

The advance will meet with much resistance, since there is a chance that it may not be firmly maintained. Furnacemen will draw upon accumulated stocks until they are exhausted, so that the Coke trade is expected to be pretty dull early in April.

In line with the recent purchases of Pig by a leading Pittsburgh concern is the buying of 10,000 to 15,000 tons of Old Material by the same interest. It is reported that a similar buying movement has taken place in the Mahoning Valley.

Cincinnati reports sales of 20,000 to 25,000 tons of Pig Iron, thus showing a continuance in the activity in that market. In other sections the movement is moderate. The advance in Coke ought to give the Southern furnaces an advantage of about 50¢ a ton over their Northern rivals, whose cost of production will be increased.

Pig Iron.—Reports from New England indicate that there is a somewhat better movement there. In the New York market business is dull and competition is very keen. We quote $12 @ $12.50 for No. 1; $11 @ $12 for No. 2, and $10.50 @ $11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at $11.25 @ $11.50 for No. 1; $10.25 @ $11 for No. 2; $10 @ $10.50 for No. 3; $10 @ $10.75 for No. 2 Soft, and $10.50 @ $10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.50 @ $10.

A very considerable improvement in the demand for Pig Iron is reported from Philadelphia, and in Bessemer an advance of about 25¢ ℔ ton. In non-Bessemers, however, prices are unchanged, although there is less Iron for sale at the inside figures, and in some instances sellers ask a trifling advance, but nearly all the sales were at last week's prices. Some large lots were taken, the volume of business averaging larger than for many months past, the idea among consumers being that if prices do not advance they will certainly not decline. There is a full supply, neverthcless, and holders have not been slow in meeting the demand when the right kind of bids were made. Asking prices are slightly higher and in most cases about as follows for Philadelphia delivery and 20¢ @ 25c less for points within a radius of 100 miles South or West:

Standard No. 1 Foundry X	$12.00 to	$12.50
Standard No. 2 Foundry X	11.25 to	11.50
No. 2 Plain	10.75 to	11.00
No. 1 Soft	11.50 to	11.75
No. 2 Soft	10.75 to	11.00

According to advices from Chicago, trade in local Coke Iron was hardly as active the past week as it has been, but the volume is still excellent and better inquiries are now in hand. The firmness of the local makers is somewhat resented by large consumers who are approaching the time for renewing contracts, and they are endeavoring to make a break in the line. It is likely that some of these purchases may be deferred in the hope of tiring the manufacturers. Business generally, however, is large enough to make the latter feel quite sure of their ground. They are, therefore, slightly advancing prices instead of marking them down. Business in Southern Coke Iron has been only of moderate dimensions. The attitude of Southern furnacemen is fairly firm, but occasionally a concession is given to secure some specially desirable order. Lake Superior Charcoal has been extremely quiet. Quotations are as follows for cash:

Lake Superior Charcoal	$12.75 to	$13.00
Local Coke Foundry, No. 1	10.25 to	10.50
Local Coke Foundry, No. 2	10.00 to	10.25
Local Coke Foundry, No. 3	9.50 to	9.75
Local Scotch No. 1	10.25 to	10.50
Ohio Strong Softeners, No. 1	12.50 to	13.00
Southern Silvery, No. 1	11.50 to	11.75
Southern Silvery, No. 2	11.25 to	11.50
Southern Coke, No. 2	10.00 to	10.25
Southern Coke, No. 3	9.50 to	9.75
Southern, No. 1, Soft	10.00 to	10.25
Southern, No. 2, Soft	9.75 to	10.00
Alabama Car Wheel	17.50 to	18.00
Jackson County Silvery	15.00 to	15.25
Other Ohio Silvery	14.25 to	14.50

Sales during the week in the Pittsburgh market have been exceedingly light. The demand for Foundry Irons does not improve and prices are as low as ever. Recent sales of Foundry Iron have been made at prices as low, or lower, as have yet been made. Under existing conditions it is somewhat difficult to quote the market, but for April and May delivery it is fairly represented by the following quotations:

No. 1 Foundry	$10.25 to	$10.50, cash
No. 2 Foundry	9.50 to	9.75 "

Further large sales of Pig Iron have been made in the Cincinnati market during the past week, and at the moment further transactions of importance and magnitude are pending. The aggregate transactions range between 20,000 and 25,000 tons, a prominent feature being the number of small orders placed. The Iron sold covers all sorts and kinds, both Coke and Charcoal, Northern and Southern brands, Mill and Foundry grades. If there is any predominance it is in favor of Mill Iron, one lot of 5000 tons being reported. Most of the transactions cover four to six months in delivery and one lot of 1000 tons Foundry Iron was sold to a local consumer for delivery during the entire year. Quotations are given as follows:

Southern Coke, No. 1	$9.75 to	$10.00
Southern Coke, No. 2	9.00 to	9.25
Southern Coke, No. 3	8.50 to	8.75
Ohio Soft Stone Coal, No. 1	14.50 to	15.00
Ohio Soft Stone Coal, No. 2	14.00 to	14.50
Lake Superior Coke No 1	11.75 to	12.25
Lake Superior Coke, No. 2	10.75 to	11.50
Hanging Rock Charcoal, No. 1	16.00 to	16.50
Hanging Rock Charcoal No. 2	15.50 to	16.00
Tennessee Charcoal, No. 1	13.00 to	13.50
Tennessee Charcoal, No. 2	12.00 to	12.50
Bessemer	11.65 to	12.00
Standard Southern Car Wheel	15.75 to	16.75
Lake Superior Car Wheel and Malleable	14.25 to	14.75

The demand for Pig Iron in the St. Louis market does not show any material change from the several preceding weeks. Orders are limited in size but are more numerous. The local consumption shows a steady increase and shipments are being received without any requests to hold them back. Prices are unchanged and No. 2 Foundry is quoted at $6.50, f.o.b. cars Birmingham. It is difficult to induce consumers to anticipate their wants more than 30 days ahead, so that the volume of business is necessarily limited. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.00 to	$10.25
Southern Coke, No. 2 Foundry	9.25 to	9.50
Southern Coke, No. 3 Foundry	9.00 to	9.25
Southern Car Wheel	16.00 to	16.50

Metal Market.

Pig Tin.—Speculation has been exceedingly cautious, narrow at that, but mainly "bullish" in a sentimental way. That is to say, some operators have made the most of conditions calculated to raise prices, and, meeting little resistance, accomplished something without adding much to their holdings. In other words, wholesale prices were carried up to the basis of 14¢ net cash for prompt and current month delivery, while the discount on futures has been narrowed as well. The purchases for out of town jobbing account and by consumers have increased somewhat, and indicate that deliveries, although somewhat extensive of late, have been well taken care of, leaving the market in quite good form, as far as position of stocks here is concerned. The market closed very firm with prices at the highest point of the week. Quotations on small lots of Straits from store are virtually unchanged at 14½¢ @ 15¢ ℔ lb.

Copper.—Current report has it that considerable Copper has recently been sold for export. At headquarters the usual lack of knowledge of anything of the sort was displayed. The outside statements place the volume of business at about 2000 tons, but are extremely vague as to price and delivery. It would appear, however, that negotiation with home trade buyers has moderated somewhat and that offers at recent extremely low prices are not duplicated. To this extent the market has improved, but the turn is almost wholly on stock for immediate delivery. Forward deliveries are the subject of negotiation at prices upon which buyers and sellers appear to be considerably apart. In retail business inquiry has been moderate. Prices for small jobbing quantities are unchanged on a basis of 10½¢ for Lake Ingot.

Sheet Copper.—No material improvement is noticeable in the demand for Cornice Copper, which still keeps below the average of the season. Rather better inquiry is, however, regarded as indicating a larger business later in the spring, when building work now beginning or in contemplation gets well under way. The outlook is looked on as being decidedly more promising for this class of goods than has been the

case for a year or two past. Small lots of Sheet Copper from store are quoted at the net list price of 14¢ ℔ lb

Pig Lead.—Business has been less active in this market the past week. Dealings and negotiation served to carry prices higher, however, and stimulative advices from the West gave additional tone. The price for small lots of American Pig from store rules at the same level that it has held for some weeks past, namely, 3⅜¢ @ 3½¢ ℔ lb.

Spelter.—Outside of ordinary carload business there has been little doing here, but orders from other quarters have gone out more or less freely and the trade resulting therefrom has served to give the market quite good tone. Prices for small jobbing parcels of good Western brands are quoted at 3¾¢ @ 4¢ ℔ lb.

Sheet Zinc.—There is little change in the market for this material. Demand from consumers is commonplace in the extreme, and prices exhibit no change from the figures quoted from week to week for some time past, namely, 4½¢ @ 4¾¢ ℔ lb for 600-lb casks and 5¢ @ 5¼¢ for smaller lots.

Antimony.—Business has been rather slow and the market is weakish under the influence of lively competition. Prices for small parcels are quoted at 9¼¢ @ 9½¢ for Cookson's and 8¢ for Hallett's.

Nickel.—Seller's quotations remain at 35¢ @ 40¢, according to quantity.

Tin Plate.—The market does not show quite as good form as it did a week ago. Large business, particularly in orders for future deliveries, has fallen off somewhat, and spot stock in quantities is only in fair demand. Small business, however, keeps up pretty well, and, in the aggregate, has not made a bad showing. Milder weather has stimulated the demand for Roofing Plates to some extent in this section. Prices have suffered no radical change, but the market is weaker to this extent, that it is easier to buy at figures that sellers mentioned very recently as being too low.

A special London cable dispatch of March 27 to *The Iron Age* reports on the British Tin Plate market as follows: Tin Plate has been in good demand and buyers have manifested eagerness to place contracts at last week's prices. Makers are reluctant to book forward orders owing to uncertainty of the wages question. Asking prices average about 2 pence dearer. Quotations, f.o.b. Wales, are as follows:

Bessemer Cokes, IC 14 x 20	9/3	@ ....
Siemens Cokes, IC 14 x 20	9/6	@ ....
Ternes, 20 x 28	17/6	@ 22/6
Charcoals, IC 14 x 20	10/	@ 13/

Sheet Iron.—The demand for both Black and Galvanized Sheets continues active, and the fact that buyers are insisting on early shipments indicates that stocks are light. Several of the mills have contracted for their output up to July 1, but others are firmer as to their prices for forward deliveries. Small lots of No. 27 Common Iron are quoted at 2 60¢ @ 2.65¢ from stock and of Galvanized at 75 and 10 % off.

JACOB BROMBACHER'S SONS, 30 Cliff street, New York, manufacturers of Tinners' Tools and Machines, have moved their office in this city to their Brooklyn factory, 31 Fulton street, near Fulton ferry. Hereafter shipments will be made direct from the warehouse in Brooklyn, where a complete stock will be carried. The sample room is still maintained at 30 Cliff street.

Chicago Report.

Scrap.—Only a moderate trade is in progress. Dealers quote their buying prices as follows, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$6.50	....
Machinery Cast	5.50	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	7.50	....
Copper Bottoms	....	6 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	6 ¢
Light Brass	....	3 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2¼¢
Rubber	....	4 ¢

Anthracite.—Dullness prevails. Carload lots of 12 net tons or over are quoted as follows, although some concessions are now being made:

	Egg, Grate.	Sto. and Ch.
Chicago, Ill	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	7.95	8.20
Council Bluffs, Iowa	7.95	8.20
Lincoln, Neb	8.10	8.35
Sioux City, Iowa	7.95	8.20
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	7.75	7.95
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	7.95	8.20
Leavenworth, Kan	7.95	8.20
Omaha, Neb	7.95	8.20

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

Trade Notes.

WILLIAM CONNERS, Troy, N. Y., has secured a large order for American Seal Paint, with which the Hotel Champlain at Bluff Point, N. Y., is to be painted, the work to be done by Callanan & Prescott, Keese Valley, N. Y.

THE RECEIVERS of the McCullough Iron Company of Chester, Pa., have petitioned the court to be allowed to borrow $32,000 with which to erect a galvanizing works.

WE HAVE RECEIVED from the Prince Mfg. Company, 71 Maiden lane, New York, a pamphlet entitled "The Rusting of Iron and Steel: How it may be Prevented and How it is Promoted." This pamphlet describes and mentions the principal characteristics of Prince Brothers' Mineral Brown, formerly called Prince's Metallic Paint. This Paint is made of iron ore which is carefully roasted to change it into peroxide of iron, which is then ground to an impalpable powder and finally mixed with pure linseed oil. It is stated that this paint is particularly applicable to iron and steel surfaces which it is designed to prevent from rusting; that it covers well, adheres with the greatest firmness and altogether forms a very perfect and durable covering.

CONDITION OF THE

Hardware Trade.

THE INDICATIONS OF IMPROVEMENT in the general business situation, which are quite marked in some directions, are regarded by many as the precursors of a general revival of trade and a return to a normal demand. Those who take a comprehensive view of the market are therefore watching it closely with a view of determining the probable course of things and deciding upon the policy which should be pursued, so as to take prompt advantage of any favorable turn. It seems hardly likely that the downward course of prices of raw material and staple goods can be continued much longer, and there are some indications of a strengthening in tone. In the Hardware market there is little new to report. Prices are not materially changed except in the matter of Tacks. There is a perceptible improvement in the demand in many sections, and the South and West are certainly doing a fair, and in some cases a good, business. The Eastern and Middle States apparently are not quite so active, the trade being still very conservative in their purchases. Business is also somewhat spasmodic and uneven. Seasonable goods have a prominent place in nearly all orders. Some manufacturers report business nearly up to normal volume when it is estimated by the quantity of goods handled, but the low prices now current keep down the aggregate in dollars and cents.

Advices from Chicago. — Heavier business is reported by Shelf Hardware jobbers. The packing floors of the local houses now look very much like old times. A few concerns have recently been obliged to employ their packing force at night. The demand covers all kinds of merchandise. The country trade is evidently forcing merchants to buy much more liberally, as orders are almost invariably specified for prompt shipment, showing that goods ordered are immediately needed by consumers. Tinware is in very good demand. Tin Plates are moving more freely, and Roofing Plates have again taken their proper place in shipments from local jobbing houses. Staple goods are moving only moderately and are not contributing their usual bulk to the volume of the business. The Heavy Hardware trade is much better than at any previous time this spring. Wagon makers, blacksmiths and machine shops are purchasing quite freely, and in some cases stocks are being ordered by consumers who think this a good time to make a little preparation for the future.

Notes on Prices.

Wire Nails.—There is a good deal of inquiry and a pretty free movement of Nails, but the market shows the effect of the recent large purchases, many jobbing houses being apparently supplied sufficiently to cover their present requirements It is expected that with the advance of the season business will increase in volume and that a large trade will be done. The market in the matter of prices is in substantially the same condition as a week ago. Most of the manufacturers are maintaining prices quite firmly and the market has a good tone.

Advices from Chicago.—A very good carload trade is reported by manufact-

urers, with some indication of stocking up among the jobbers, outside of this immediate locality. Orders which are so received are in every case for immediate shipment. The manufacturers hope that this is the forerunner of the usual spring rush, which has now been delayed some three or four weeks owing to the steadiness of the cold weather. Jobbers' prices show no change, but stand at $1 to $1.05 for small lots from stock, with a few houses still quoting 95 cents for carload lots. The end of these low prices, however, is very rapidly approaching.

Cut Nails.—Trade has not been especially active during the past week, but the mills report a good many inquiries and refer to the indications for the opening season as being on the whole encouraging. Small lots from store at New York are quoted at 85 to 90 cents.

Advices from Chicago.—Manufacturers have recently enjoyed an excellent trade in carload lots, but have as yet seen no disposition among their customers to lay in stocks. Small lots from stock stand at $1.

Barb Wire.—Manufacturers continue to take a hopeful view of the outlook and report inquiries and orders good for the season, considering the prevailing conditions. Prices are about as they have been for the past week or two. The disposition of some of the jobbing houses to shade manufacturers' quotations is having some effect on the market.

Advices from Chicago.—The large business noted last week has maintained its volume, but it did not develop into the great activity expected. This was probably due to less favorable weather for a few days, which, however, has again changed for the better. Business now in progress is well up to the capacity of the mills, but at this time of the year manufacturers are accustomed to being rushed. It is expected that within the coming month a heavier trade will surely be felt. Small lots from stock are quoted in a regular way at $1.65 and $2. Some of the jobbers, however, continue to cut manufacturers' prices 5 cents per 100 pounds, but they say the situation is such that these extreme prices are likely to be withdrawn any day.

Tacks.—Revised list prices on Tacks, to which reference was made in our last issue, have been announced by the Atlas Tack Corporation and other leading manufacturers. In the new list prices are revised throughout and inequalities in the old list corrected. With the exception of a few unimportant corrections made in 1889, there has been, we believe, no revision of the Hardware Tack price-list since 1882. Since that date numerous new styles of packing have come into vogue, and as a consequence numerous price-lists to correspond. One object of the manufacturers in adopting this new list, which will be known as the list of March 25, 1895, is to consolidate these lists in one, with the correction of inequalities, so as to make it represent the present costs of the goods. Under the former list the smaller sizes were relatively too low and the new list prices are accordingly increased. From the discount sheet which is given below it will be seen that the list is relatively a high one, the manufacturers having adopted this policy in accordance with the request of the various jobbers' associations for high lists and long discounts. The new list has been adopted by nearly all the manufacturers in the country, and it is hoped that it will be found to give satisfaction to all interests and remain for a long time without change. The few manufacturers who did not participate in the preparation of the list will undoubtedly adopt it, so that it will be uniformly used. The discounts applying to the new list are as follows, with an additional 33⅓ per cent. and 2 per cent. for cash, with the usual deliveries:

	Discount. Per cent.
Carpet Tacks.†	
American	66⅔
Steel	66⅔
Swedes, S. S	66⅔
" Lanc	62½
Leathered	33⅓
Steel—gross and ½-gross packages	66⅔
American Cut Tacks †	62½
Swedes Iron Tacks.	
S. S	62½
Lanc	57½
Upholsterers' Tacks.†	
S. S	66⅔
Lanc	62½
Gimp Tacks.†	
S. S	66⅔
Lanc	62½
Lace Tacks.†	
S. S	62½
Lanc	57½
Trimmers' Tacks.†	
S. S	55
Lanc	50
Looking Glass Tacks	33⅓
Picture Frame Points	33⅓
Basket Tacks	62½
Berry Box Tacks	62½
Trunk Tacks.†	
S. S	66⅔
Lanc	62½
Miners' Tacks, S. S	66⅔
Bill Posters' and Railroad Tacks.†	
S. S	66⅔
Lanc	62½
Brush Tacks and Nails.	
S. S	55
Lanc	50
Hungarian Nails	57½
Common and Patent Brads	50
Finishing Nails	57½
Trunk Nails †	57½
Clout Nails †	57½
Basket Nails †	50
Chair Nails	45
Cigar Box Nails	45
Plymouth Rock Tacks	66⅔
Miniature Keg Tacks	66⅔

† Blued, Bright, Tinned or Coppered.

Above discounts are for straight weight goods. Additional discounts will be given on Star ** weights of 5 per cent.; standard *** weights of 10 and 5 per cent. and special *** weights of 10 and 10 per cent. beyond straight weight discounts.

Freight will be prepaid or the actual cost of delivery will be allowed on goods in quantities of 300 pounds or more to Boston, New York, Philadelphia, Baltimore, and to the principal points on or east of the Missouri River.

Milk Can.—The Porcelain Lined Milk Delivery Can put on the market by Stuart & Peterson Company, Burlington, N. J., and illustrated in our last issue, is sold at 50 cents for the 1-quart size and 70 cents for the 2-quart size, subject to a discount to the trade of 50 per cent.

Roaster or Oven.—Leach Roaster & Baker Company, Paxton, Ill., are manufacturing the Champion Roaster or Oven which was illustrated in *The Metal Worker* of the 23d inst. This article is sold from the following list, which is subject to a discount of 33⅓ per cent. to the trade:

No.	
1	$1.50
2	2.20
3	2.65

Glass.—The sub-committee appointed by the Window Glass manufacturers to inquire into the cost of imported Glass in the East has verified the statement which has been made that domestic Glass has been sold below the price of the imported article. The difference in price is stated to average about 15 per cent., and has had the effect, it is believed, of keeping something like 1,000,000 additional boxes of foreign Glass out of the market. While the low price of American Glass has kept so large a quantity of foreign Glass out of the country, it has done so at the expense of the home manufacturers, which in some cases has been so sorely felt that better prices are deemed a necessity. It is considered probable that when prices take an upward turn the price of imported Glass will be the basis governing the selling price of American Glass. It is not improbable that the cost of American Glass, at least of some sizes, will be increased by the demands of the workers or by concessions in wages on the part of manufacturers, or by both, before the factories start in the fall. The outlook indicates no scarcity of Glass for the spring and summer trade, as it is estimated that there are from 1,200,000 to 1,800,000 boxes of Glass in the hands of the manufacturers, buyers and large consumers. There is no change in the condition of trade, the demand being limited and for immediate consumption only, while prices are in an unsettled condition.

Old Metals.—The demand continues fair, but the supply of most kinds of Old Metals is amply sufficient to prevent any radical change in prices. In Iron there is a good demand for Cast and Scrap. Quotations in a general way are unchanged, the following representing dealers' purchasing rates for moderate lots, New York delivery:

Heavy Copper	₩ lb 7 ¢
Light and Tinned Copper	₩ lb 6½¢
Heavy Brass	₩ lb 4¾¢
Light Brass	₩ lb 3¾¢
Lead	₩ lb 2¾¢
Tea Lead	₩ lb 2½¢
Zinc	₩ lb 2⅜¢
No. 1 Pewter	₩ lb 10 ¢
No. 2 Pewter	₩ lb 5½¢
Wrought Scrap Iron, ₩ gross ton	$7.50 @ $8.00
Heavy Cast Scrap ₩ gross ton	7.50 @ 8.50
Stove Plate Scrap	₩ gross ton 5.00
Burnt Iron	₩ gross ton 3.00

Old Rags, Paper, &c.—The demand for Paper Stock is fair but somewhat irregular. Dealers' purchasing prices have not advanced any, quotations being as follows for this city:

No. 1 White Rags	₩ lb 3 @ 3¼¢
No. 2 White Rags	₩ lb 2¼ @ 2½¢
Mixed Rags	₩ lb ¾ @ 1 ¢
Blues and 3ds	₩ lb 1⅛ @ 1⅜¢
Hard Sized White Shavings	₩ lb 2⅛ @ 2¼¢
No. 1 White Book Shavings	₩ lb 1¾ @ 2⅛¢
No. 2 White Book Shavings	₩ lb 1 @ 1⅜¢
Light Book Shavings	₩ lb ⅝¢
No. 1 Mixed Shavings	₩ lb ⅞ @ 1 ¢
No. 2 Mixed Shavings	₩ lb ⅝ @ ¾¢
No. 1 Printed Books	₩ lb 1 @ 1¼¢
Ordinary Mixed Books	₩ lb ½ @ ¾¢
Newspapers	₩ lb ½ @ 3-5¢
No. 1 Manila Paper	₩ lb ¾ @ 1 ¢
No. 2 Manila Paper	₩ lb ⅝ @ ¾¢
Bogus Paper	₩ lb ⅛¢
Common Paper	₩ lb ¼ @ ⅜¢
Straw Chips	₩ lb ⅜¢
Binders' Clippings	₩ lb ⅜¢
Jute Butts	₩ lb 1⅛ @ 1¾¢
No. 1 Jute Bagging	₩ lb 1 @ 1¼¢
Mixed Bagging	₩ lb ¾ @ 1 ¢
No. 2 Bagging	₩ lb ½ @ ¾¢
Hemp Twine	₩ lb 2 @ 2½¢
Manila Rope	₩ lb 2 @ 2⅛¢
Jute Rope	₩ lb 1¼ @ 1¾¢
Mixed Rope	₩ lb ¾ @ ⅞¢

Old Rubber.—The following quotations represent about the prices paid by dealers, New York delivery:

Car Springs, ton lots, ₩ lb	$0.03¾ @ .04
Rubber Shoes, carloads, delivered at factory, ₩ lb	@ .05¼
Rubber Shoes, less than carloads, ₩ lb	@ .04¾
White Wringer Rolls, ₩ lb	@ .03½
White Syringes, ₩ lb	@ .03⅜

Metal and Miscellaneous Prices.

CHICAGO, MARCH 28, 1895.

Tin—

Straits pigs .....15½@¾¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $5.50
	IC, 12 x 12	@ 5.50
	IC, 14 x 20	@ 5.50
	IC, 20 x 28	@ 11.00
	IX, 10 x 14	@ 7.25
	IX, 12 x 12	@ 7.25
	IX 14 x 20	@ 7.25
	IXX, 14 x 20	@ 9.00
	IXXX, 14 x 20	@ 10.75
	IXXXX, 14 x 20	@ 12.50
	IX 20 x 28	@ 14.50
	IXX, 20 x 28	@ 18.25
	IXXX, 20 x 28	@ 21.75
	IXXXX, 20 x 28	@ 25.25
	DC, 12½ x 17	@ 5.25
	DX, 12½ x 17	@ 7.00
Allaway Grade.	IC, 10 x 14	@ 5.12½
	IC, 12 x 12	@ 5.12½
	IC, 14 x 20	@ 5.12½
	IC, 20 x 28	@ 10.25
	IX 14 x 20	@ 6.75
	IXX, 14 x 20	@ 8.00
	IX 20 x 28	@ 13.50
	IXX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box
Steel Coke—IC, 10x14.14x20	@$4.50
IC, 14x20, 100 lb	@ 4.3½
IC, 14x20, 90 lb	@ 4.2·
10 x 20	@ 7.00
20 x 28	@ 9.50
IX, 10x14, 14x20	@ 6.00
B.V. Grade. IC, 10x14, 14x20	@ ....

Charcoal Plates.—Terne

Guaranteed Plates command specia prices, according to quality.

Kanzel and Dean Grades.—

IC, 14 x 20	@$4.50
20 x 28	@ 9.00
IX, 20 x 28	@ 11.50

Worcester Brand and equal.—

IC, 14 x 20	@ 4.87½
IC, 20 x 28	@ 9.75
IX, 14 x 20	@ 6.12
IX, 20 x 28	@12.25

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$11.75	$11.25
XX, 14 x 28	13.00	13.75
X, 14 x 31	13.00	12.50
XX, 14 x 31	15.00	15.00
		Per box of 56 sheets
X, 14 x 56		$12.50
XX, 14 x 56	26.50	14.00
X, 14 x 60		13.50
XX, 14 x 60	32.25	15.00

American Tin Plates.

Charcoal Plates.—Bright.

Minerva

IC, 10 x 14, 12 x 12, 14 x 20 $5.00
IX, 10 x 14, 12 x 12, 14 x 20 6.25

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20. $5.25
IX, 10 x 14, 12 x 12, 14 x 20. 6 75

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20.. 5.75
IX, 10 x 14, 12 x 12, 14 x 20.. 7.25

Usual extras or other crosses and 20 x 28 double these prices.

Irondale, AAA, tissue paper packed:

IC, full weight, 14 x 20 .....$6.25
IX, full weight, 14 x 20..... 8.00

Irondale A A:

IC, full weight, 14 x 20..... 5.25
IX, full weight, 14 x 20..... 6.75

Irondale A:

IC, full weight, 14 x 20..... 5.00

Irondale B:

IC, 100 lbs, 14 x 20 ..... 4.25
IC, full weight, 14 x 20..... 5.00

Irondale C, IC, 14 x 20, 100 lbs..... 4.50
IC, 14 x 20, full weight 4.75
Each extra cross 75¢.

Coke Plates—Bright.

R. W. & B., IC, 14 x 20, 108 lbs $4.75
Old Hundred, IC, 14 x 20, 100 lbs.... 4.50
R. W. & B., IC, 20 x 28, 216 lbs 9 50
Old Hundred, IC, 20 x 28, 200 lbs.... 9.00

Roofing Plates.

Palm, IC, 20 x 28.....@$10.00
Palm, IX, 20 x 28..... @ 12.00
Empire, IC, 20 x 28.....@ 10.75
Empire, IX, 20 x 28.....@ ....
Hickory, IC, 20 x 28.....@ 11.50
" IX, 20 x 28.....@ 14.00
Alaska (heavily coated), IC, 20x28@ 13.00
Alaska IX, 20 x 28.....@ 16.00
Special, IC, 20 x 28.....@ 13.00
" IX, 20 x 28.....@ 16.00
Niagara, IC, 20 x 28 ..... 9 50
Iroquois, IC, 20 x 28..... 9.00
Westmoreland:
IC, 14 x 20 ..... 5.00
IC, 20 x 28 ..... 10.00
IX, 14 x 20..... 6.25
IX, 20 x 28..... 12.50
Kenwood:
IC, 14 x 20..... 4.75
IC, 20 x 28..... 9.50
Furmston:
IC, 14 x 20..... 4.50
IC, 20 x 28 ..... 9.00
IX, 20 x 28..... 11.50
Irondale AA, IC, 14 x 20..... 5.75
Irondale A, IC, 20 x 28..... 10.50
Irondale B, IC, 20 x 28..... 10.00
Each extra cross $1.50.
Challenge, IC, 20 x 28.....10.50
Juno:
IC, 14 x 20..... ....
IC, 20 x 28..... ....
Illinois, Old Method:
IC, 20 x 28 ..... 13.50
IX, 20 x 28..... 16.50
E. L.:
IC, 20 x 28 ..... 10.75
IX, 20 x 28..... 13.25
Jessie:
IC, 20 x 28..... 10.25
Old Process:
IC, 14 x 20..... 8.00
IX, 14 x 20..... 9.50
IC, 20 x 28.....16.00
IX, 20 x 28 .....19.00
H. B. L., Old Style:
IC, 14 x 20..... 7.00
IX, 14 x 20..... 8.25
IC, 20 x 28.....14.00
IX, 20 x 28 .....16.50
H. G. M. & Co., New Process:
IC, 14 x 20..... 4.50
IC, 20 x 28..... 9.00

Extra Fine Granite:
IC, 14 x 20..... 4.87½
IC, 20 x 28 ..... 9.75
IX, 20 x 28..... 12.25
Ravenswood:
IC, 14 x 20..... 5.25
IC, 20 x 28..... 10.50
IX, 20 x 28..... 13.00
H. G. M., Old Style:
IC, 14 x 20..... 7.00
IC, 20 x 28..... 14.00
IX, 20 x 28..... 16.50

Continuous Roofing Tin.

Merchant's Tandem.....per roll, 2.40

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	₩ lb 2	2.60¢
17 to 20	₩ lb 2 1-10¢	2.70¢
21 to 24	₩ lb 2 2-10¢	2.80¢
25 and 26	₩ lb 2 3-10¢	2.90¢
27	₩ lb 2 4-10¢	3.00¢

Russia, Planished, &c.

100 lbs.
Patent Planished, ₩ lb, A.....$10.20 } 10%
Patent Planished, ₩ lb, B..... 9.20 } dis
Craig's Polished Sheet Steel.....8¼¢

Galvanized.

Juniata, or first quality .....
dis.75&10@75&10&2½%

Copper—

Ingot.

Lake.....10¼¢ @ 10½¢
Casting Brands..... 9¾¢ @ 10 ¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 15½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)
(To No. 19 inclusive.)
Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)
Discount, 40%.

Slab Spelter—

Western Spelter..... ....3¾¢

Sheet Zinc—

600 lb casks..... ....$4.50
300 lb casks,..... 4.75
Loose sheets..... 5.00

Solder—

½&½..... 9¾@10¢
Extra Wiping..... ....8½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson..... ....9¾@10
Hallett's.....8½@8¾

Lead—

Soft Pig Lead.....3¼¢
Bar.....3¾¢
Pipe.....6½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10¢

Wrought-Iron Pipe—

¼ and under, Plain	70%
¼ and under, Galv	64%
⅜ and over, Plain	77½%
⅜ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	68%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½
Steel Boiler Tubes	27½
Cold Drawn Seamless Steel Tubing	6%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 5 inches, inclusive.....dis 75&10%
Other sizes..... dis 70%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	70%
Gordon & Gilbert's Corrugated	70%
Ritchie's (Galv. Iron only) Cor'd	70%
Ritchie's Spiral Lock Seam, Galv'd	60%
Austin's Spiral Ribbed Pipe	65%
James A. Miller Bros. (Galv'd Iron only) Corrugated	70%

Elbows—

Adjustable.....50&10@60%
Spiral.....60%

Furnace Fittings

Discount from Excelsior Steel Furnace Co.'s list
50&10%, delivered east of Omaha

Steel Roofing—

Perfection.....$2.75 square
Climax.....$2.65 square
The Lloyd Spanish Tiling.....$4.50 square

Metallic Shingles

Cushman's.....$2.10 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list 70%

Paints, Oils, &c.—

Deodorized Benzine.....₩ gal @ 10
Iron Paint, Bright Red.....₩ lb, 1¢
" " Brown.....₩ lb, 1½¢
" " Purple.....₩ lb, 2½¢
" Ground in oil, B. Red ₩ lb, 6½¢
" Ground in oil, Red..₩ lb, 6½¢
" Ground in oil, Brown ₩ lb, 5½¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Rolled, in bbls.....60¢
Linseed Oil, Raw, in hhls .....58¢
Mineral Paints.....2@4¢
Orange Mineral.....8¢
Pure White Lead in Oil.....5½@5¾¢
Dry White Lead in bbls.....4¾@5½¢
Red Lead, American.....5½@5¾¢
Red Venetian, English, dry .....1½@1¾¢
Red Venetian in oil; asst'd cans, 8¾¢ kegs.....7½¢
Sipe's Japan Oil, in bbls. ₩ gal..... .34¢
Spirits Turpentine, in hhls., ₩ gal. 42¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.40
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.00
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.25
Roofing Pitch, lb hhl. of 800 lb..... $2 80

NEW YORK, MARCH 29, 1895.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots.....₩ lb, 63¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 58¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ lb, 60¢
100-lb lots.....₩ lb, 55¢
Ton lots.....₩ lb, 53¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ lb, 55¢
100-lb lots.....₩ lb, 53¢
Ton lots.....₩ lb, 50¢

Antimony—

Cookson .....₩ lb, 9¼@9½¢
Hallett's.....₩ lb, 8 ¢

Brass—

Planished.. .....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.	
¼-in. up to 2-in	$0.35	30% @ 25
⅝-in. up to ¾-in	.36	
½-in. up to ⅝-in	.38	
⅜-in. up to ½-in	.41	
5-16-in. up to ⅜ in	.48	
¼-in. up to 5-16-in	.65	
3-16-in. up to ¼-in	1.00	
⅛-in. up to 3-16-in	1.50	
Smaller than ⅛-in.	Special	
8 in. and larger	Special	
8 in. to 3 in., to No. 19, inclusive,	.38	

Copper and Bronze Tubing—

2¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized.....70%
Galvanized, Locked Joints.....70%
Tin.....70%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats. 18¢ ₩ lb, net
Ingot.

Lake.....10¼¢
Ansonia Grade Arizona.....10¼¢
Ansonia Grade Casting.....9¾¢
Planished.....net
Sheet and Bolt.....14¢ ₩ lb, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895:
Lap or Slip Joint, Galvanized.....75%
Lap or Slip Joint, Terne.....70%

Eave-Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....85%

Stove-Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7 Inch.
No. 1..	$0.70	.77	.82	.87	1.05 per doz.
No. 2..	.61	.66	.71	.74	.... "

Elbows and Shoes—

Flat Crimp.

Tin.....85%
Galvanized.....85%

Corrugated.

Flat Crimp.

Galvanized.....70%

Round or Square.

Tin.....70%
Galvanized.....70%

Iron, Sheet—

Black.

Nos.	Common American.	R. G. Cleaned American.
10 to 16	₩ lb 2.25	2.50¢
17 to 21	₩ lb. 2.35	2.60¢
22 to 24	₩ lb, 2.45	2.70¢
25 and 26	₩ lb. 2.55	2.80¢
No. 27	₩ lb. 2.65	2.90¢
No. 28	₩ lb, 2.75	3.00¢
American B. B.	₩ lb,	4¢@4¼¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11@11½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb 8¾¢

Galvanized.

	B. B.
Nos. 10 to 16	75&10% off.
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3½@3¾¢
Bar.....4@4½¢
Pipe.....5¼¢ 20%
Tin Lined Pipe.....12¾¢ 20%
Block Tin Pipe.....25¢ 20%
Sheet.....6¼¢, 20%
Old Lead in exchange, 2½¢ ₩ lb.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	30%
Netting, Painted Sheets	30%
Door Mats, Galvanized	35%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb..... ....5¾
Lead, Amn. White, in oil..... .. @ 5¾
Lead, Red, hbls. and ½ hhls... .. @ 5¾
Lead, Red, kegs..... .. @ 5¾
Ocher, American..... .. @ 1½
Red Venetian, American..... .. @ 1½
Linseed Oil:
Raw, ₩ gal..... .. @ .56
Boiled..... .. @ .59
Spirits Turpentine:
In hhls..... .. @ .30
Putty:
In barrels and ½ hhls..... .01½ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01¾ @ .02¼
In bladders..... .01¾ @ .02¼
Roofing Material, &c.:
Asphaltum Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ lb..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch ₩ hbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches	65&10%
Fittings, Pipe, " "	65&10&10%
Extra Heavy Pipe, " "	65&10&10%
Fittings, Heavy Pipe, " "	65&10&10%
Large sizes of both kinds	65&10%
Fittings for both kinds	65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60

Rock and Slag Wool—

	₩ lb.	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	63½¢

Rosin—

Common and Good—Strained

Rosin, C. & D	₩ bbl. $1.66@$1.67
Rosin, E. & F	₩ bbl. $1.70@$1 80
Rosin, G. & H	₩ bbl. $1.90@$2.15
Rosin, I. & K	₩ bbl $2.35@$2 60
Rosin, M. & N	₩ bbl $2.90@$3 00

Seamless Brass Tubes..net

List, December 7, 1894.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:	
Best Bangor, ₩ sqr	$3.25@$4.50
Pen Argyle, ₩ sqr	3.00@ 3.85
Peach Bottom, ₩ sqr	4.75@ 5 60
No. 1 Chapman, ₩ sqr	3.90@ 4.25
Lehigh Slates, ₩ sqr	3.00@ 4.50
Vermont:	
Sea Green, ₩ sqr	1.75@ 2.25
Purple, ₩ sqr	3.25@ 4.00
Unfading Green, ₩ sqr	3.25@ 3.75
Red, ₩ sqr	3.00@ 3.75

Solder and Soldering Fluids—

Solder—

½&¼, guaranteed.....11¢
No. 1.....8½@10¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.

In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 lb., ₩ lb	3½¢
½ bbls., about 300 lb., ₩ lb	4¢
Kegs, about 110 lb., ₩ lb	4¢
75¢ extra for keg.	5 % dis.
Kegs, about 55 lb., ₩ lb	4¢

Yager's Soldering Salts.

¼-lb bottles, each.....80¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter.....3¾¢@4¢
Bertha (pure).....7¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb.....15@15½¢
Straits, pigs, ₩ lb.....14½@15¢
Straits in bars, ₩ lb.....15½@16¢

Tin Plates—

American Terne Plates—

N. B.—The following Terne Plate quotations are for 20 x 28, unless otherwise specified; 14 x 20 Plates are half the prices given below.

Alaska (re-squared) IC	$13.00
Alderly, extra quality, IC	10.75
Allegheny, IC	9.00
" IX	11.50
Anchor, IC	8.25
Apollo Roofing, IC	11.00
" " IX	13.00
Black Diamond (Extra Coated), IC	15.00
Bonus (Extra Coated), IC	11.50
" " IX	14.50
Boston, IC	12.50
Brooklyn, IC	9.00
Capitol, IC	8.50
Central, IC	9.00
Climax, IC	8.75
Columbia, IC	12.50
" IX	15 50
Columbus, IC	9.00
Dunlap's Double Dipped, IC	15.00
" " " IX	17.00
" Domestic, IC	10.00
Empire, IC	10.25
Eureka, IC	9.50
" IX	12.00
Eureka, 200 lbs., IC	9.25
Excelsior, IC	9.50
Filbert, IC	14.50
Flag, IC	8.00
Florida, IC	9.50
Flushing, IC	12 50
Freeport (Hand dipped and Resquared), IC	13.00
IX	15 50
F. R. P., Extra, IC	15.00
Globe, IC	8 50
" IX	11.00
Golden Star Old Style, IC	15.00
" " " " IX	18.00
Grace, IC	8.50
Hamilton's Best Redipped, IC	15.50
" " " IX	18.50
Hickory (Resqnared), IC	11 00
J. L. O., IC	9.00
" IC, 200 lb	8.50
Juniati, IC	8.50
Juno, IC	11 00
Kensington, IC	13.50
" IX	16.00
Knoxall, IC	9 00
" IX	12.00
Laufman's Apollo (Resqnared), IC	13.00
Laufman's Apollo (Resquared), IX	16.50
Leominster, Extra Coated, IC	11.50
Lion (Stamped), IC	11.00
Lnln, IC	10.50
" IX	13.50
Maple, IC	11 00
" IX	14.00
Merchant's Roofing (Resquared), IC	15 00
Meurer's Old Method, IC	15.00
Meurer Roofing, IC	14.00
National, IC	11.00
Nava, IC	10.00
" IX	12.50
New Castle Old Method, IC	18.00
New Castle Palm, IC	14.50
Old Colony, IC	15.00
Old Method, IC	13.00
" IX	16.00
Osborn's Old Method, IC	13.00
Osborn's Old Process, IC	14.00
" " " IX	17.00
Osceola, Old Style, IC	14.50
" " IX	17.50
Pennsyl Old Method (Treble Coated), IC	14 00
Phillips' Roofing, IC	14.00
Phœnix, IC	9.25
Pullman, IC	11.50
Republic, IC	9.50
Scott's Extra Coated (Resqnared), IC	16.00
Scott's Extra Coated (Resquared), IX	19.00
Standard, IC	8.50
Star IC	10.50
" IX	13.00
Superior, IC	9.00
Taylor Old Style (Resquared), IC	15 00
" " " " IX	18.00
The Taylor Roofing, IC	13 50
" " " IX	16.00
The Osborn Roofing, IC	11.50
" " " IX	14.00
Thomson's Puritan, IC	11.00
Tip Top, IC (Resqnared)	9.75
" IX "	12.25
Triumph, Old Style, IC	15.00
" " " IX	18.00
U. S. Monongahela, IC	12.20
U. S. Redipped, IC	16.50
Venus, IC	8 25
Waldo, IC, Hand-dipped	11.50
Westmoreland, IC	12.50
Willow, IC	10 00
" IX	13.00
Zero, IC	9.00

American Bright Plates—

Almond, IC, 20 x 28	$9.00
" IX, 20 x 28	11 50
Brilliant (Tissue Packed), IC, 20x28	16.50
" " " IX, 20x 28	20.00
Brooklyn, IC, 14 x 20	5.50
Century, IC, 14 x 20	5.00
Climax, IC, 14 x 20	4.75
Excelsior, IC, 14 x 20	6.50
" IX, 14 x 20	7.50
Florence, IC, 14x20	5.50
Florida, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Gladys IC, 14 x 20	4.50
Golden Star (tissue pck.), IC, 14x20	6.00
" " IX, 14x20	7.50
Hazel, IC, 14x20	5.50
Ivy, IC, 20 x 28	12.00
" IX, 20 x 28	15.00
Linden IC, 20 x 28	10.00
" IX, 20 x 28	12.50
Mars, IC, 14x 20	4.50
" IX, 14 x 20	5.50
Merchant's Dipped, IC, 14x20	10.00
Merlon, IC, 20 x 28	11.00
" IX, 20 x 28	14.00
Mint, IC, 20x28	8.50
" IX, 20x28	11.00
New Castle Best Palm Charcoal, IC, 14 x 20	5 50
" " IX, 14 x 20	6.75
New Castle Palm Charcoal, IC, 14 x 20	5.00
" " IX, 14 x 20	6.25
New Castle, Charcoal, IC, 14 x 20	4 50
" " IX, 14 x 20	5.50
New Castle, S. Charcoal, IC, 14 x 20	4.25
" " IX, 14 x 20	5.25
New Castle Palm Coke, IC, 14 x 20	4.25
" " IX, 14 x 20	5.25
New Castle Coke, IC, 14 x 20	4.00
" " IX, 14 x 20	5.00
Oak, IC, 14 x 20	4.75
Osborn, IC, 14 x 20	4.75
" IX, 14 x 20	6.00
Palma, IC, 14x20	6.00
Pansy, IC, 20 x 28	10.50
" IX, 20 x 28	13.00
Phœnix, IC, 14x20	5.25
" IX, 14x20	6.50
Royal, IC, 20x28	12.00
" IX, 20x28	15.00
Silver Star, IC, 14 x 20	5.10
" IX, 14 x 20	6.50
U. S., IC, 14x20	7.25
Versailles, IC, 14 x 20	5.75
Walnut, IC, 14 x 20	4.65
Youghlogheny, IC, 14 x 20	6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20	$6 2
20 x 28	12.5
Pontymister Old Style Grade, IC, 14 x 20	5.50
20 x 28	11.00
IX, 14 x 20	6.50
20 x 28	13.00
Worcester Grade, IC, 14 x 20	4.50
20 x 28	9.00
IX, 14 x 20	5 75
20 x 28	11.50
Dean Grade.—IC, 14 x 20	4.25
20 x 28	8.50
IX, 14 x 20	5.50
20 x 28	11.00
Abercarne Grade.—IC, 14 x 20	4.00
20 x 28	8.00
IX, 14 x 20	5.50
20 x 28	11.00
Mansel Grade, IC, 20 x 28	8.00

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ lb.

Melyn and Calland Grade.	IC, 10 x 14	$5.25
" "	IC, 12 x 12	5.50
" "	IC, 14 x 20	5.25
" "	IC, 20 x 28	10.50
" "	IX, 10 x 14	6.50
" "	IX, 12 x 12	7.00
" "	IX, 14 x 20	6.50
" "	IX, 20 x 28	13.00
" "	DC, 12½ x 17	5.00
" "	DX, 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14	4.75
" "	IC, 12 x 12	5.00
" "	IC, 14 x 20	4 75
" "	IC, 20 x 28	9.50
" "	IX, 10 x 14	5.50
" "	IX, 12 x 12	5.75
" "	IX, 14 x 20	5.50
" "	IX, 20 x 28	1.00
" "	DC, 12½ x 17	4.25
" "	DX, 12½ x 17	5.00

Coke.

Steel Coke.—IC, 10x14, 14x20	4.25
10x20	6.50
20x28	8.50
IX, 10x14, 14x20	5.25
B. V. Grade.—IC, 10x14, 14x20	4.25

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)	$11.50
IXX, 14x28..(112 sheets)	11.90
IXX, 14x81..(112 sheets)	18.25

Tinning—

Brass and Copper.....

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—

Improved Lock Frame, per doz.....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and under, Plain	70%
1¼ and under, Galv	64%
1½ and over, Plain	77%
½ and over, Galv	68%
Boiler Tubes	75@77½%
Screw and Socket Joint Casing	65%
Inserted Joints Casing	60%

Zinc—

600 lb casks.....₩ lb 4¾¢
Per lb.....5¼¢

It Is Reported—

Alabama.

That Harwell & Armistead is the name of a new Hardware concern at Montgomery.

Arkansas.

That Daniel Abney has opened a new Hardware store at DABNEY.

That W. A. Tymich has opened a Hardware and Implement store at HAZEN.

That Moss & Martin have succeeded J. W. Moss in the Hardware business at DYER.

California.

That E. S. Fowler, Hardware, MIDDLETOWN, has sold out to F. W. Henderson.

Connecticut.

That Charey & Latham, in the Hardware business at NEW LONDON, have been succeeded by Daniel Latham.

Florida.

That Mr. Watts of DE LAND, formerly of LEESBURG, will soon remove to BRAIDENTOWN, where he will engage in the Hardware business.

Illinois.

That Jones & Allen are successors to Ruddy Bros. at PONTIAC.

That Harry Evans has bought a half interest in the Hardware store of Galloway & Son, WELLINGTON. Hereafter the firm will be Galloway & Evans, Mr. Galloway, senior, retiring from the business.

That N. G. Clark and William Cronable have bought out the Hardware store of G. G. Shearer at MAQUON.

That Miller & Stephenson's Hardware store at NEPONSET was burglarized a short time since and $200 worth of goods carried away.

That W. A. Melody's Hardware store at WAUKEGAN was robbed of $200 worth of goods on the 10th inst.

Indiana.

That J. Patterson & Co, Hardware, &c., PETERSBURG, have been succeeded by Petersburg Implement Company.

That the Hardware store of Griffin Bros., NOBLESVILLE, was entered by burglars on the 17th inst., and a large amount of Cutlery and fine Revolvers stolen.

That the Fuller Hardware Company of CRESTON have been incorporated, with a capital stock of $50,000. The incorporators are M. E. Fuller, A. R. Fuller and A. Roy Fuller.

That G. E. Wetmore of VILLISCA has bought a Hardware store at MOUND CITY, Mo.

That the Marsh Cure Hardware Company have succeeded J. W. Stebbings at SPENCER.

That M. J. Lahiff has purchased the Hardware store of J. T. Hood at CLARE.

That Fletcher Emory of NORTHWOOD has bought Garner Bros.' Hardware store at MASON CITY.

Kentucky.

That Ebelhar & Co. have embarked in the Hardware business at OWENSBORO.

That W. R. Ladd & Co. of MIDDLESBOROUGH are closing out their Hardware business.

Maine.

That I. G. Vannah & Co., GARDINER, in addition to other improvements which they have been making, will remove the shelves on the west side of the store and replace them by a set of drawers extending the length of the store and from the floor to the ceiling. There will be nearly a thousand of them in all. They will be made of white wood and pine.

That George Houghton will shortly open a new Hardware store at MARS HILL.

Massachusetts.

That Matthew R. and Frank E. Loud have opened a Hardware store at SOUTH WEYMOUTH.

Michigan.

That Charles S. Blom, Hardware, KALKASKA, has been succeeded by H. L. Pipp & Co.

That E. E. Kohler, formerly in the employ of the Pontiac Hardware Company, and C. B. Pittman & Co., PONTIAC, has purchased a stock of Hardware at BYRON and will open a store there.

That Frank B. Kelley has become a member of the Newark & Drury Company of CADILLAC.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

TRAVELING SALESMEN visiting stove and tinware, hardware or plumbing trade, jobbing or retail, can learn of something of interest. "B.," B. J. W. & Co., Lock Box 47. Mercer, Pa. Mar. 30

A first-class LITHOGRAPHER and JAPANNER on tinware. "L. J.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 30

SALESMAN handling line of stoves or business connected therewith, to sell our stove pipe radiator as a side line on commission; liberal terms. Levi Hey & Co., 311 and 313 State street, Rochester, N. Y. Mar. 30

Live SALESMAN, practical TINNER, and one capable of estimating and setting warm air furnaces preferred, on a commission basis; liberal inducements will be given the right party; reference required. Box 330, Ashtabula, Ohio. Mar. 30

A thoroughly competent man in every State in the Union to appoint and take charge of canvassers for the introduction of a patented article of great merit and many ready selling qualities; liberal discounts and good money to the right parties. Lisk Mfg. Company, Limited, Canandaigua, N. Y. Mar. 30

PATTERN MAKER on iron patterns; one who understands his business and would be willing to make himself generally useful around a foundry; a man living in Brooklyn, N. Y., preferred; state full particulars and salary wanted. "Roe," No. 42, office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 23

TRAVELING MAN to represent a line of cooks, ranges and heaters in States of Ohio, Indiana and Illinois. "Stoves," office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. Mar. 23

SITUATIONS WANTED.

By a young man, 20 years old; one year's experience as plumber's helper; best of reference from last employer; strictly temperate. P. O. Box 361, Seymour, Conn. Mar. 30

By a practical TINSMITH; 18 years' experience on range, pump, iron pipe, furnace, tin and sheet iron work, plumbing and all country jobbing; steady job; temperate; references. Wallace Stevens, Richmond Hill, N. Y. Mar. 30

By a first-class STEAM and HOT WATER FITTER; can do a good job of plumbing; understands tinning and both in and ouside work; eight years' experience; strictly temperate; can give the very best of reference; wants steady work; state wages. "P. A.," care Geo. Hilbert, 491 Avenue D, Bayonne, N. J. Mar. 30

By a first-class TIN and SHEET IRON WORKER; understands furnace, heater work and roofing; can do some plumbing; town in New England preferred. "P.," 63 Chapman street, Greenfield, Mass. Mar. 30

By a PLUMBER and TINNER; six years' experience at city and country work; good habits. Box 521, Springfield, Mass. Mar. 30

Young man, 16 years of age, wants to learn plumbing and tinning trades; willing and obliging; best of references. S. Klein, 1208 First avenue, New York. Mar. 30

As FOREMAN or CUTTER in a cornice and skylight shop by a first-class cutter and draftsman; wages moderate. "Cornice Cutter," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 30

By two experienced men in the line of tin and hardware; one has had years of experience; would work in shop or store, or take charge of same; the other is a strong, practical man; good on furnaces; both can furnish good references. M. F. Sherman, Avoca, N. Y. Mar. 30

By a first-class PLUMBER; city or country. W. Chandler, 277 West 127th street, New York. Mar. 30

By a PLUMBER; nine years' experience handy at steam fitting; city or country. John Strond, 149 Lenox avenue, New York City. Mar. 30

By a first-class PLUMBER; city or country. John Feneran, 401 East Sixty-fifth street, New York City. Mar. 30

Good side line for Wisconsin; can furnish good references. Box 214, Gobleville, Mich. Mar. 30

By a thoroughly experienced hardware, stove and heavy hardware SALESMAN; 12 years' experience on road; best references and wide acquaintance with trade from Missouri River to Pacific Ocean; age, 35 years. "W. S. B.," P. O. Box 115, Grand Junction, Col. Mar. 30

A first-class PLUMBER; 18 years at trade; steady job; city or country. James Ray, 203 East Forty-seventh street, New York City. Mar. 30

By a first-class PLUMBER; steady work; city or country. John Pratt, 630 Third avenue, New York City. Mar. 30

By a first-class PLUMBER; 15 years' experience; city or country. James Hand, 1609 Lexington avenue, New York City. Mar. 30

By a first-class PLUMBER; city or country. Thomas McKenna, 302 East Eightieth street, New York City. Mar. 30

By a young man at roofing and cornice work; five years' experience; can give good reference; will work for moderate wages. Wm. J. Rooney, 45 Park avenue, Albany, N. Y. Mar. 30

By a young man who is a practical ROOFER, SPOUTER and PIPE WORKER; competent to take charge of business; having experience in contracting, &c.; reference furnished if required; strictly temperate. Lock Box 523, Apollo, Pa. Mar. 30

By a man who can do tin, hot air, furnace, cornice and heavy sheet iron work, and cut his own patterns; steady and strictly temperate; 23 years of age; single; good references. G. R. Bergstrom, 1104 Edgerton street, St. Paul, Minn. Mar. 30

By an industrious, temperate young married man with ten years' experience at all kinds of outside work; also heater, range, pump and iron pipe work; state wages; steady work; city or country. "E. H.," 318 S. Prince street, Lancaster, Pa. Mar. 30

By a practical TIN and SHEET IRON WORKER, GAS and HOT WATER FITTER; 16 years' experience in general jobbing; can clerk in store; wages not so much an object as a steady job; married; temperate; good reference. J. Waiden, 500 Central avenue, Minneapolis, Minn. Mar. 30

By a licensed PLUMBER, who can do tin, sheet iron, iron pipe, pump and furnace work; strictly temperate; married; will work for employer's interests; steady job wanted with good parties. "Plumber," 7 Oxford street, Lynn, Mass. Mar. 30

By a first-class FURNACEMAN and TINSMITH; also plumber. "First Class," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 30

By a first-class TINNER; owing to hard times would work for board and clothes; good references. "Tinner," 265½ Main street, Salt Lake City, Utah. Mar. 30

A first-class PLUMBER and GAS FITTER wishes position in the West, Colorado or California preferred; 18 years' experience; can figure and take charge of any kind of work. James J. Garry, 320 East Fortieth street, New York City. Mar. 30

By a young man, a PRACTICAL TIN and SHEET IRON WORKER; ten years' experience; understands all kinds of inside and outside work; can furnish best of reference in regard to character and workmanship. Frank Gunn, 45 Marvin street, Saratoga Springs, N. Y. Mar. 30

In a good jobbing shop by a young man 28 years of age; can do plumbing, tinning and iron pipe work; good general jobber; would work for a railroad company; sober and steady; good references. "Tinner," 160 Walnut street, Bloomfield, N. J. Mar. 30

By a young man, 22 years of age, with four years' experience in tin and sheet iron work, also jobbing; sober; good reference. H. M. Langley, Box 132, Gallipolis, Ohio. Mar. 30

By a first-class TINNER; 18 years' experience on roofing, spouting, furnace work, tinware and general job work; some knowledge of plumbing and iron pipe fitting; married; good habits. "Tinner," Lock Box 757, Belvidere, Ill. Mar. 30

A TINNER with full set of tinners' tools will accept situation by the year with some good responsible hardware firm and furnish tools; have had 12 years' experience in tin shop; can give estimates on all kinds of tin, sheet iron and furnace work; can furnish high class references. "Tools," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Mar. 30

By a young man with six years' experience at tin and sheet iron work, iron piping and general jobbing. "J. D.," Sidney, N. Y. Mar. 30

By a young married man; ten years' experience, at roofing, lead and iron piping, spouting, hot water, furnace, assortment work and general jobbing; steady position; country preferred; state wages. "D. H. B.," 415 Mulberry street, Rooms 29-30, Syracuse, N. Y. Mar. 30

By a young man, who is a TIN ROOFER CORNICE and SKYLIGHT MAKER; city or country; wages moderate; steady job wanted. J. Grossberger, 807 East Ninth street, New York City. Mar. 30

As SALESMAN, or any position of trust, by a man of 15 years' experience in hardware, stove and furnace business; best of references. Atlantic Mfg. Company, 97 Haverhill street, Boston, Mass. Mar. 30

Permanent position by a young man in a hardware store; six years' experience as bookkeeper and salesman; good reference; state salary; the East preferred. A. J. Voikman, 756 W. Washington street, Jackson, Mich. Mar. 30

By man 24 years of age, as PLUMBER, TINSMITH and GENERAL JOBBER; eight years' experience at the trade; strictly temperate; can also do a fair job at steam or gas fitting. "S. C.," Lakeport, N. H. Mar. 30

By a first-class PLUMBER who thoroughly understands all kinds of job tin work; can estimate and handle men; 14 years' experience. J. M. Flower, Wellsville, N. Y. Mar. 30

By a METAL PATTERN MAKER; can file and fit; used to stove and hollow ware patterns. "J. M. D.," 108 South Division street, Auburn, N. Y. Mar. 30

By a practical and strictly first-class PLUMBER in city or country; neat lead worker; 20 years' experience as foreman in a press shop in New York; understands plans; can furnish best of reference; strictly sober. A. E. Moran, 169 Willis avenue, New York City. Mar. 30

By a PLUMBER; 15 years' experience; sober. H. O'Brien, 223 East 100th street, New York. Mar. 30

By a TIN AND SHEET IRON WORKER; best of references. Aug. Schneider, 282 West 118th street, New York City. Mar. 30

By a young mechanic, 24 years of age; TIN and SHEET IRON WORKER; used to general inside and outside work; country preferred. "Mechanic," care Bedford Heating Company, 2 McDonough street, Brooklyn, N. Y. Mar. 30

By a PLUMBER who understands all branches of his trade; city or country. D. H. Wright, Jr., Box D, 413 West 125th street, New York. Mar. 30

As SUPERINTENDENT of stove foundry; can furnish best of references as to ability; has had several years' experience. M. O'Connor, care Eugene Munsell & Co., Elizabeth, N. J. Mar. 30

Steady position by a young man at flat and standing seam roofing, guttering and leader work, and also jobber on stoves, ranges and furnaces. "Tinner," 117 Liberty street, Bloomfield, N. J. Mar. 30

By a practical TIN and SHEET IRON WORKER; one who has a thorough knowledge of furnace, heater and range work, direct and indirect heating, ventilating; competent to take charge of sheet iron department of heating and ventilating; can work from plans and estimate for work; have had charge of shop heating, ventilating and general jobbing; also manufacturing tinware and heavy ware for hotel, restaurant and steamship supplies; will furnish A1 reference as to character and abilities. "Ability," care of F. Riviere, 29 Liberty street, Newark, N. J. Mar. 30

By a young man who has had five years' experience at plumbing and steam fitting; strictly temperate; has taken course in plumbing at the New York Trade Schools. J. Denby, Jr., Box 451, Sanford, Maine. Mar. 30

A good line of corrugated conductors, gutters, &c., or hardware specialties for Milwaukee, on commission; good trade established. "S.," 334 Twenty-first avenue, Milwaukee, Wis. Mar. 30

As PLUMBER, by a young man; good jobber; country preferred. Wm. Roulston, care Daly, 181 First avenue, New York City. Mar. 30

A practical STEAM and HOT WATER FITTER wishes a position as salesman on the road for some boiler or radiator firm; I understand making estimates and drawings, or would accept a position as foreman of construction of heating apparatus; am engaged at present with a large firm; I can give references. "Salesman," 122 Scioto street, Portsmouth, Ohio. Mar. 23

By a TINSMITH; 15 years at the trade; roofing, heater, range and furnace work; city or country. C. Conklin, 276 Seventh street, Jersey City, N. J. Mar. 23

Special Notices.

FOR SALE.

A No. 43 Ferracute Press and a No. 2 Bliss Double Seamer with combination bottom dies, wiring dies and horn for straight seams. These goods have been used but very little and are in perfect condition Will sell cheap. Also a 4 H.-P. Paynes Automatic Engine and an 11 H.-P. Boiler, both in good condition. Address

H. C. BROWN,
North Billerica, Mass.

A Chance Seldom Met With.

The entire business plant of the Weir & Nixon Combination Steam Heating Co. will be closed out to a practical mechanic having ability to handle same. The apparatus is the most powerful of its kind (which those installed will prove). The patentee, Mr. Nixon, having died and Mr. Weir wishing to retire, the patent, patterns, material and stock will be sold on favorable terms. Apply to J. A. WEIR,
1410-12 N. 6th St., Philadelphia.

WANTED.

A second-hand seven-foot or eight-foot Cornice Brake. Address

WM. S. GARRISON,
111 Powers St., Brooklyn, N. Y.

WANTED.

To buy good paying Steam Plant less Engine. One that can be moved. Small plant preferred, to run with other business. Also two Steam Hammers Address "STEAM PLANT," office of *The Metal Worker*, 96-102 Reade St., N. Y.

Desirable Business Opportunity For Sale.

A rare chance to purchase an old established business. Foundry buildings comparatively new, with modern improvements for making light or heavy castings. Capacity 65 to 80 moulders. Products delivered by truck without change to any part of New York, Brooklyn or Jersey City. Full line of valuable patterns and flasks (not machinery) Necessary machinery to do an extensive business. Buildings ample for business purposes and storage Constructed in the best manner, equipped with automatic sprinklers and heated with steam. A large wharf for handling goods and supplies by water. Location unexcelled for convenience. For further information address

"SELLER,"

office of *The Metal Worker*, 96-102 Reade Street New York.

FOR SALE.

A set of Tinners' Tools and Machines. All new and first-class. Address "DEALER," office of *The Metal Worker*, 96-102 Reade Street, New York City.

WANTED.

To correspond with some party who has money to invest in a good manufacturing business. Articles manufactured are patented in the United States, the patent rights for the States of California, Washington and Arizona for sale. Address

INDIANA LADDER COMPANY,
Indiana, Pa.

RECEIVER'S SALE.

The entire plant and good will of the Stark Machine and Tool Co., including real estate, tools, machinery, patterns, etc., also thousands of dollars of orders on hand. This plant is located at the corner of Hudson and Seventh Sts., Buffalo, N. Y., and consists of a four story brick building fully equipped for the manufacture of tinners' machines and tools, machinery for working sheet metal, presses, dies, etc. The factory is now in operation and all information in reference to same cheerfully given. Address MICHAEL NEWELL, Receiver, Corner Hudson and Seventh Sts., Buffalo, N. Y.

FOR SALE.

New process for retinning bathtubs without removing or disturbing plumbing or wood work. Patented October 2d, 1894. City, county or State rights for sale.

D. B. HILTON,
480 Clermont Ave., Brooklyn, N. Y.

A RUST-PROOF APPLICATION.

Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish to 6 cents per pound. Send for circulars.

YATES & CO., Rockford, Ill.

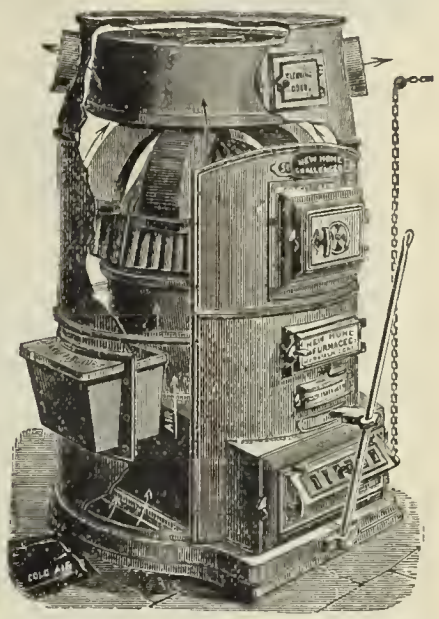
G. & J. R. BOLTON HEATERS

New Home HOT AIR FURNACES.

HOT WATER.



STEAM.



The Foskett & Bishop Co,

MANUFACTURERS.

The Best Heating Apparatus in the World.

NEW HOME FURNACE CO.,
NORWALK, CONN.

END FOR PRICES, ETC.

SALESROOM:

George H. Raymond, Manager, 114 Liberty St., New York.

Special Notices.

FOR SALE.

A tin, stove and hardware business, doing a good trade, will be sold for cash at a reasonable price; good reasons for selling. Address

"REASONABLE,"
office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE or TO LEASE.

An established Plumbing and House Furnishing business at Narragansett Pier, R. I. Inquire of W. H. GRIFFITH & CO., on premises, or address D. D. CLARK, Westerley, R. I.

FOR SALE OR EXCHANGE.

A 6-foot Robinson Cornice Brake for sale, or will exchange it for one 8 or 10 feet long of the same make; is in good condition. Address

CHRISTIAN OFF & CO.,
230 East Washington St., Indianapolis, Ind.

FOR SALE.

No. 7 Sturtevant Blower, only short time in use. Address

EUGENE MUNSELL & CO.,
218 Water St., New York.

WANTED.

Good second hand 20-inch folder. Also Robinson's double end folder.

P. O. BOX 338,
Pittsburgh, Pa.

TO TAKE INTEREST.

Wanted, a plumber and steam fitter with about $800 to invest, as a partner in old established business in the South. Address "SOUTH," office of *The Metal Worker*, 96-102 Reade St., N.Y.

TINNERS

and others who wish to manufacture on royalty the Novel Lid Hand Handle Holder for tea kettles, write to D. O'LEARY,
Winchester, Cal.

Special Notices.

WANTED.

Line Hard Coal Base Burner for season '95 by stove manufacturing company not making them, to handle in connection with their own, who thoroughly and actively canvass the territory of Ohio, Indiana, Michigan, Illinois and Wisconsin. Address

"HARD COAL,"
office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

The proprietor of a well equipped Stove Foundry, being engaged in another business to which he is required to give most of his time, desires to dispose of the foundry. Melting capacity, nine tons. Very favorably situated as to supply of material and labor and with splendid facilities for distributing to any section of the country. Address "FOUNDRY," Box 39, office of *The Metal Worker*, 96-102 Reade St., New York.

PLUMBING, HEATING & VENTILATION



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE circular stating subject you wish to study to **The Correspondence School of Industrial Sciences, Scranton, Pa.**

FOUNDRY FOR SALE.

Located in Elizabeth, N. J., 12 miles from New York, on line of the New Jersey Central Railroad and within a few blocks of tidewater. The property consists of 21 city lots 25 x 100. Main building for mounting and storage, 40 x 150, four stories and cellar, with 3 brick extensions, as follows: Engine room, carpenter shop and scratch room. Three moulding floors, as follows: One 75 x 200, under one roof, and two brick extensions, each 30 x 90 feet. Adjoining is a one-story brick building, 25 x 100, for patterns. Also brick stable 15 x 20. Plenty of yard room, etc. Everything in first class shape. If wanted for stove foundry purposes could be bought, with all the necessary machinery, cupola, engine and boiler, tumbling mills, shafting, emery grinders and all necessary machinery for a first-class foundry. Address

"STOVE FOUNDRY,"
Office of *The Metal Worker*, 96-102 Reade St., New York.

OHIO ICE CREAM FREEZER



"Tickled to Death."

There isn't a Freezer in the market to compare with this.

Our Prices are Right,

and we would like you to see it. Send for a sample to

The S. C. Tatum Co.,

144 to 180 Water Street,

CINCINNATI, O.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention for **Free** report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.
PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.
F. B. STOCKING, Attorney at Law
611 F ST., N. W., WASHINGTON, D. C.

ESTABLISHED 1853.

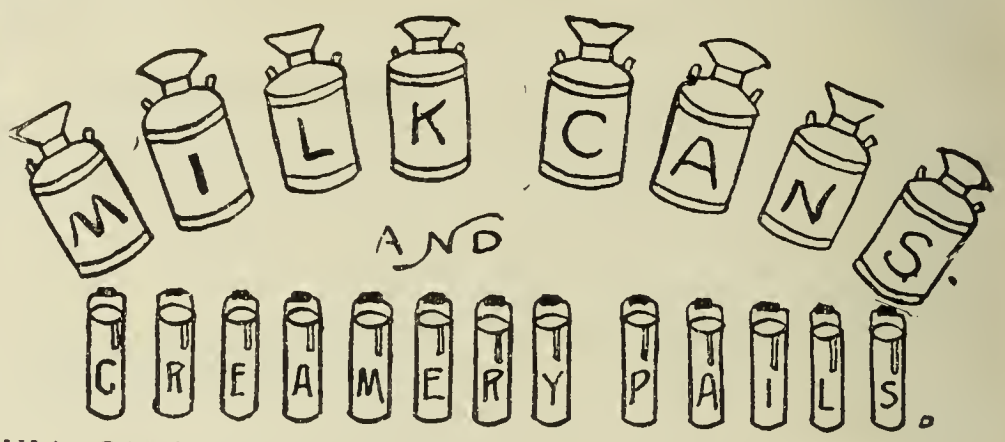
HOWSON & HOWSON

Counsellors at Law,

Solicitors of Patents

OFFICES:

PHILADELPHIA,
Forrest Building, 119 S. 4th St
NEW YORK,
Potter Building, 88 Park Row
WASHINGTON,
Atlantic Building, 928 F. St.



MILK CANS MADE UP.
MILK CAN STOCK.
CREAMERY PAILS MADE UP.
CREAMERY PAIL TRIMMINGS.

Railroad Milk Cans, City Milk Cans, Factory Cans.

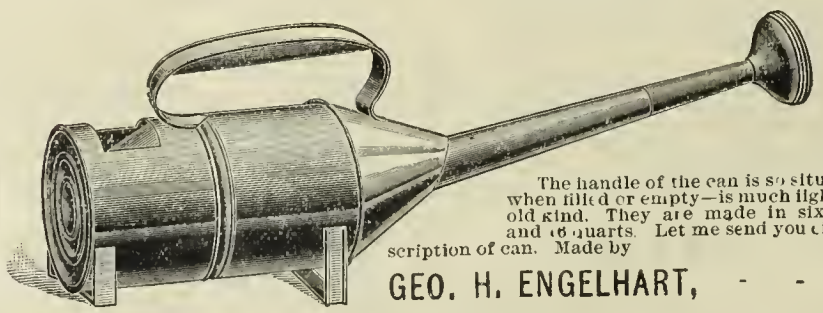
Illustrations and Prices sent upon application.

SIDNEY SHEPARD & CO.,
BUFFALO, N. Y.

C. SIDNEY SHEPARD & CO.,
CHICAGO, ILL.

Proprietors of the BUFFALO STAMPING WORKS.

CHAS. C. CHASE, JR., Philadelphia Sales Agent, Room 320, 423 Chestnut St.
C. W. WELLS, New England Sales Agent, 19 Pearl St., Boston, Mass



The Standard Watering Pot.

The handle of the can is so situated that it balances when filled or empty—is much lighter to carry than the old kind. They are made in six sizes—6, 8, 10, 12, 14 and 16 quarts. Let me send you circular giving full description of can. Made by

GEO. H. ENGELHART, - - Glenville, O.



ALUMINUM

Ingots, Sheets, Rods, Tubes, Wire and Castings,
Cooking Utensils and Tableware,
Tea and Coffee Pots, Chafing Dishes, Rice Boilers, &c.
Write for New Catalogue.

THE WOHLER ALUMINUM COMPANY,
55 Jackson Street, - - - - Chicago, Ill.

— No Such Fiend.—"Can I write my name under the received payment on this bill?" asked the collector, who likes to put things as delicately as possible.

"No, thank you," replied Mr. Brokely. "I'm no autograph fiend."—*Washington Star.*

— "Whut yoh dun whup de boy foh?" asked Uncle Eben as he came into the cabin with a sable youngster whimpering at his side.

"I whup 'im 'cos he done stole er mushmillion f'om de freight train," replied Aunt Chloe, with a glance of indignation.

"He done stole a mushmillion!"

"Dat's whut he done. It's scan'lous ter t'ink ob dat boy whut we raise so keerful stealin' mushmillions! An'," she added, with increased feeling, "dah wus watshmillions in de nex' kyah!"—*Washington Item.*



ROYAL
WASH BOILER HANDLE.



PATENTED.

We call the trade's special attention to the Royal Handle, being the cheapest and the most durable handle in the market, fully protected by a number of letters patent, and all manufacturers using the handle report that their trade on wash boilers has largely increased. Over 100,000 handles sold in our local trade last year.

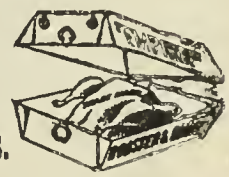
The advantages gained by using the Royal Handle can be readily seen, as it far excels the old fashioned tin or iron drop handles in beauty and strength, fits the hand perfectly and is always cold and adds greatly to the general appearance of boiler. Manufactured only by

HASLET, FLANAGEN & CO.,
116 N. 2d St., PHILADELPHIA, PA.

NEW YORK ELBOW CO.,
18 Cliff St., N. Y. City.



Makers of
Elbows
AND
Roasters.



THE TRIUMPH COOKER,
WITH LOCK COVER.



STEAMLESS, ODORLESS AND NON BOIL-OVER.
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.
A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.
THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD. CONN.



The largest and best assorted stock in America' All requisites for the draughting room. We have made a study of this line and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable.

CATALOGUE ON APPLICATION.

CLARK'S NEW FAUCET
— FOR —
MILK and CREAM CANS, ETC.



This Cut is 2-3 the Size of Faucet.

Made of brass, nicely finished and plated, with 5-8-inch opening. Will be made with a thread on stem for screwing into a bushing when so ordered. We guarantee them tight, and they are by far the best in the market.

MANUFACTURED BY
The Clark Novelty Co.,
ROCHESTER, N. Y.

Covert Pants Stretcher.



Before. After.

THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

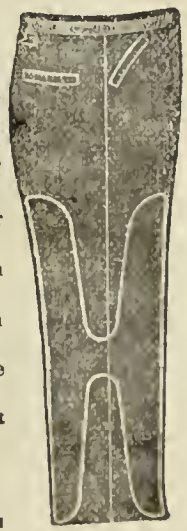
The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

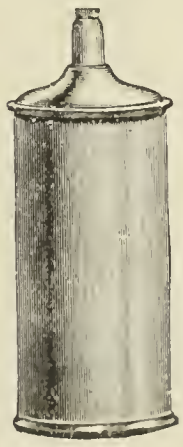
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

MANUFACTURED ONLY BY
COVERT MFG CO., WestTroy, N. Y.





This little Torch is 4 in. high and 1¼ in diam. and is designed to do away with the greasy candle. Will burn gasoline or kerosene oil.

Sold by All Jobbers.

Kendrick Valve & Washer Co.,
SYRACUSE, - N.Y.

— A CRYING NEED.—"Won't it be lovely when we girls vote?" said Mrs. Bobleigh.

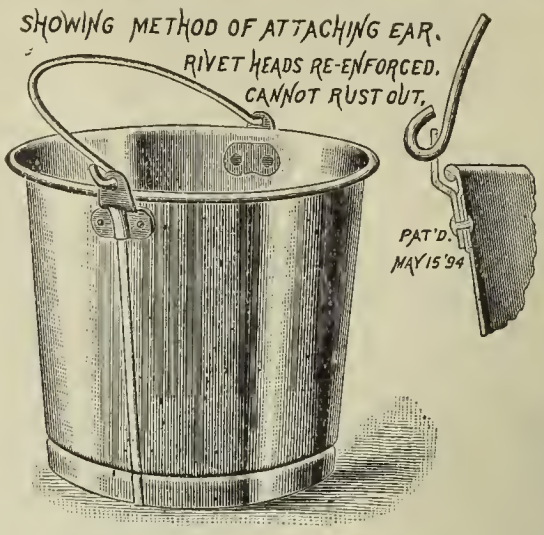
"Yes," replied Mrs. Giddithing; "only I do hope they'll leave room enough on the ballots for a postscript."—*Washington Star.*



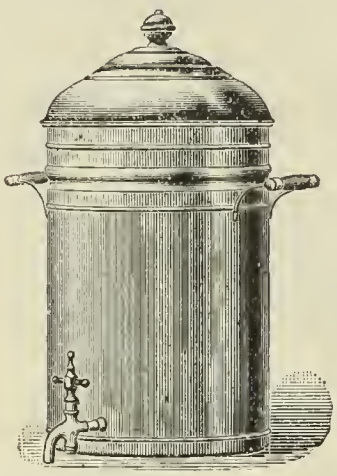
LATEST "ROCHESTER."
Patent pending.
White Satin Finish Inside.



"ROCHESTER." Patented.



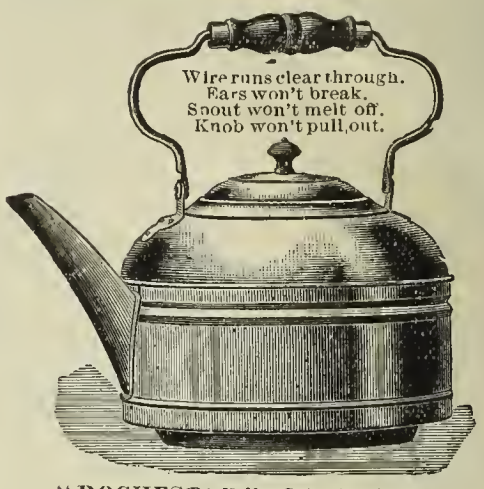
ROCHESTER STAMPING WORKS,
Rochester, N. Y.,
STILL MAKE
NO TIN COVERS ON ANY OF OUR PLATED WARE.
Better Goods Than Ever.



"ROCHESTER" COFFEE URN.
Extra Heavy Copper, Nickel Plated.
Cold Handles, Riveted on.

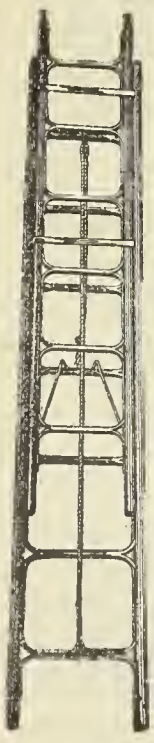


"ROCHESTER." Patented.



"ROCHESTER" OLD STYLE.
EXTRA HEAVY.
White Satin Finish Inside.





Look at this Ladder.

THE PATENT BENT RUNG LADDER.

The Strongest, Lightest and Best Ladder Made.

A sixteen-foot ladder only weighs 21 pounds. Extension ladders of this kind are easily put up and taken down by a boy. Our double and single step ladders have no equal. A six-foot step ladder will carry 1000 pounds, and will last three times as long as the old style step ladder.

Write for catalogue and price-list.

Indiana Ladder Co.,
INDIANA, PENNSYLVANIA.

ANTI-RUSTING · C. S. Mfg. Co. · WARRANTED

WE WISH IT distinctly understood by all the hardware dealers, and also dealers in Tinware, throughout the United States that the

CLIFTON SPRINGS MANUFACTURING COMPANY,
CLIFTON SPRINGS, N. Y.,

is still in existence, shipping large quantities of the

Evans Patent Anti-Rusting Tinware

(trade-mark, a Greek Cross), notwithstanding the base falsehoods heralded about the country by the salesmen of our competitors.

WEST'S DUST PAN,



Patent applied for.

the daintiest, handsomest, cleanest, cheapest and most convenient Dust Pan in the world.

You see, I don't have to get on my knees or break my back or split my dress, etc., stooping, or smother myself with dust when using this Dust Pan.

I just place my foot on the tread, thus, while I sweep the dust into the pan and carry it away like this, so the dust can't spill out.

I guess it will last my lifetime although it costs only ten cents.

For sale by all jobbers.

Write for Prices.

This is our new Dust Pan.

Patent applied



JAS. R. WEST, Man'f'r, - - Cas City, Ind.

THE CENTRAL STAMPING CO.,

23 & 25 CLIFF STREET, NEW YORK,

—P. O. Box 1997.—

Manufacturers of

Plain and Retinned Stamped Ware,

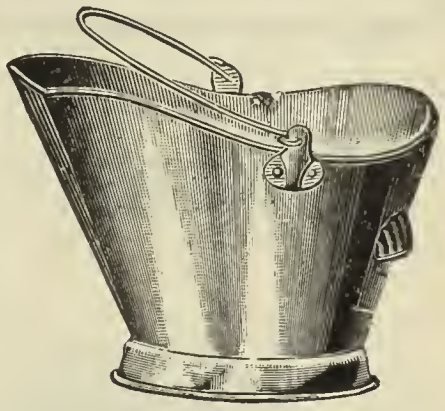


Japanned, Pieced, Heavy Polished Ware,

Planished, Britannia, Galvanized and Japanned

Sheet Iron Ware,

Stove Boards, Elbows, Etc.

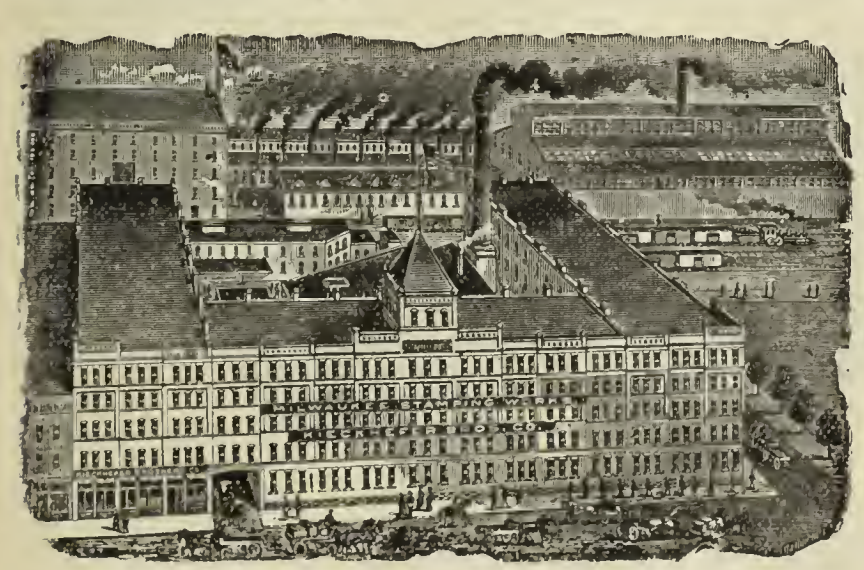


Agents for SPLENDID OIL COOKING STOVES and MAJESTIC OIL HEATING STOVES

And All Goods for the Trade.

Catalogues and Price-Lists on Application.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED, JAPANNED AND ENAMELED PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., **MILWAUKEE, WIS.**

SEND FOR CATALOGUE AND PRICES.



American

WAFFLE IRONS.

The Best for Gas or Gasoline Stoves Easy to Clean. Long Wood Handles.

Buy no Other.

"ERIE" HOLLOW WARE LEADS, ALL OTHERS FOLLOW.

ALSO COMPLETE ASSORTMENT OF

FULL NICKEL PLATED WARE,

UNSURPASSED IN FINISH.

"ERIE" ALUMINUM CAST WARE,

THE FINEST WARE EVER MADE. IT WILL PAY YOU TO HANDLE IT.

NEW GOODS FOR SPRING TRADE.

SEND FOR NEW CATALOGUE.

Try our Improved Double Broiler for Gas or Gasoline Stoves.

GRISWOLD MFG. CO., Erie, Pa.



"ERIE" ALUMINUM.



St. Louis Stamping Co.,

ST. LOUIS, MO.

MANUFACTURERS

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

ROME



Nickel Plated and Polished Copper

Tea and Range Kettles, Tea and Coffee Pots, Wash Boilers, etc.

"A FULL LINE AND SUPERIOR GOODS."

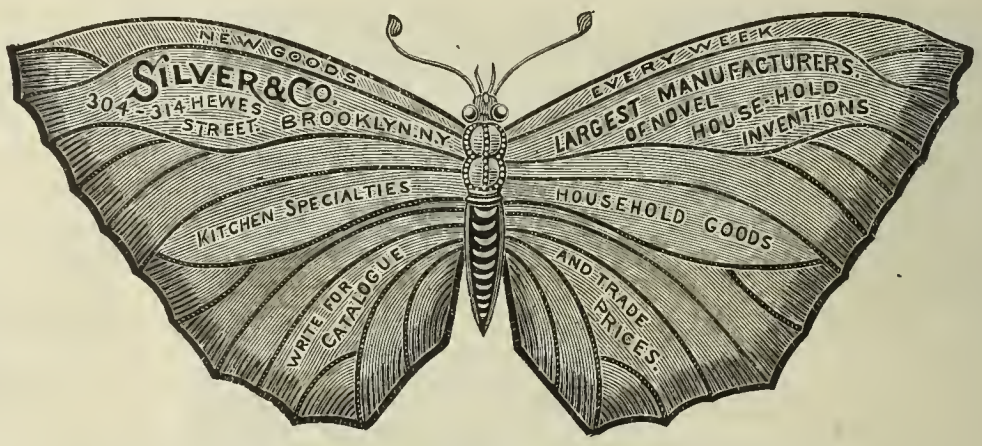
Write us for Catalogue and Prices.



ROME MFG. CO., Rome, N. Y.

New York Store, 92 Walker St.





EXCLUSIVE MANUFACTURERS OF

"BROOKLYN" PURE ALUMINUM SPECIALTIES,

"MARION HARLAND" Tea and Coffee Pots and Urns.

Royal and Crown Roasters and Bakers

Also SILVER & CO.'S Oil and Gas Stoves, Ovens and Stove Furniture.

Alcohol Stoves, Egg Utensils, Asbestos Goods, Fruit and Vegetable Presses, Steam Cookers, Milk Sterilizers, Bread and Cake Pans, Display Stands and Household Novelties.

The Best in the World.



IWAN'S

Pat. Improved Post Hole Auger

Is CONVENIENT and EFFECTIVE IN OPERATION.

Excellence of Material and Construction.

Awarded Medal and Diploma at the World's Columbian Exposition, 1893.

For sale by all leading jobbers in the U. S. and Canada.

IWAN BROS.,

SOLE MANUFACTURERS,

STREATOR, - ILL.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

CREAM CANS

. . . AND . . .

Cream Can Trimmings.



Cream Cans

With Plain Covers.
With Deep Covers.
With Extra Deep Covers.
Self Locking.

Fairmont Cream Can Gages.



Cream Can Trimmings.

Cream Can Bottoms—IX, IXX, IXXX.

Cream Can Covers—Plain, Deep, Extra Deep.

Self Locking Trimmings—Ears and Lugs; Ears, Lugs and Bails

The Geuder & Paeschke Mfg. Co.
Manufacturers,
MILWAUKEE, WISCONSIN.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the



Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

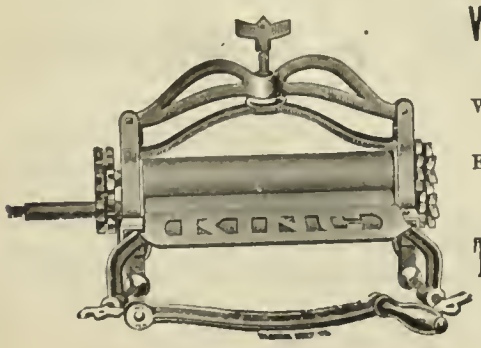
A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces. Length, 10 inches. Can be sold in all seasons.

Write to Manufacturers for Prices.



WILLIAM VOGEL & BROS, Wythe Ave., Brooklyn, N. Y.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr
Boston Office, H. F. Livermore & Co., 34 Oliver St.

SECOND EDITION.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

48 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners.

Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid, on receipt of price, 25c.

DAVID WILLIAMS,
PUBLISHER,
96-102 Reade St., New York.

THE GLOBE VENTILATOR,



FOR PERFECTLY VENTILATING

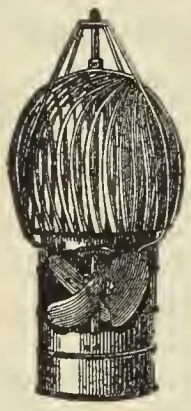
Schools, Churches, Halls, Mills, Factories and Auditoriums of every Character.

Smoky Chimneys Cured Send for Pamphlet.

—MANUFACTURED BY—

GLOBE VENTILATOR CO.,

TROY, N. Y.



SELF LUBRICATING

Rotary Screw Ventilators

WHICH PRODUCE

a Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation.

Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc.

E. G. Washburne & Co.,

Manufacturers,

46 Cortlandt St., New York

☞ *Send for illustrated circular.*

WOOD AND IRON

PATTERNS

FOR STOVES AND FURNACES.

Water and Steam Boiler Work a Specialty.

H. CLAY BASCOM, Prop.,

VEDDER PATTERN WORKS,

TROY, N. Y.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA ARTISTIC STOVE PATTERN WORKS

JOHN K. McLAUGHLIN,

215 North 2d St., - - - Philadelphia

FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE Stove Pattern Works

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

Detroit, Mich.



FOUNDRY FACINGS

sold under the name of "Radiant" are known all over the world as the best and are used by progressive foundries who want to turn out good clean castings.

If you don't use it and wish to try some send for free sample.

THE J. D. SMITH FOUNDRY SUPPLY CO., CINCINNATI O.

Our repairs are sure to fit, as they are made from manufacturers' original patterns.

MICA.

STOVE REPAIRS

219 Locust St., St. Louis.

A. G. BRAUER.

EVERY STOVE MAN TELLS THE TRUTH

WHEN HE SAYS THAT THE

RUTLAND LINING

FITS ANY STOVE.

RUTLAND FIRE CLAY CO., Rutland, Vt.



"FIRESTONE"

Has proved itself to be far superior to all others, as the most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,

TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO.

THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

When In Need of

FINE STOVE PLATE FACINGS,

Write to the **originators** and **headquarters** for prices and trial samples.

THE S. OBERMAYER CO., - - - - Cincinnati, O., and Chicago, Ill.

MANUFACTURERS OF

Foundry Facings, Supplies and Equipments. Importers and Refiners all grades Plumbago.

Catalogue and special circulars sent on application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 In.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

FOUNDRY, 42-46 Sandford St., 41-45 Walworth St., Brooklyn, N Y.
BRANCH STORE, 744 Flushing Ave., Near Broadway, Brooklyn, N. Y.

ESTATE OF **A. FROELICH,**

BROOKLYN STOVE WORKS,

MANUFACTURERS OF

Repairs for Stoves, Ranges and Heaters, and Stove Dealers' Supplies.

WAREROOMS: 289 Pearl St., near Beekman, N. Y.

We carry the **largest** and most **complete stock** of **Stove Repairs** and **Stove Dealers' Supplies** in the country. Send for Catalogue just issued.

JOHN M. WOLF, Manager.

MARCY STOVE REPAIR CO.,

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, Perth Amboy, N. J.

CHAMPION STOVE CLAY,

FOR LINING STOVES AND RANGES AND REPAIRING STOVE LININGS.

In 6 lb. bags, $1.20 per dozen. In Bulk, 1¼ cts. per lb.

PURE CEYLON PLUMBAGO,

FOR POLISHING AND LUBRICATING.

Bridgeport Crucible Co., Bridgeport, Conn.

WHAT'S THE USE

OF BLACKING YOUR STOVES THREE OR FOUR TIMES WHEN

ONE COAT

—OF—

TARBOX STOVE GLOSS

WILL DO A FINISHED JOB?

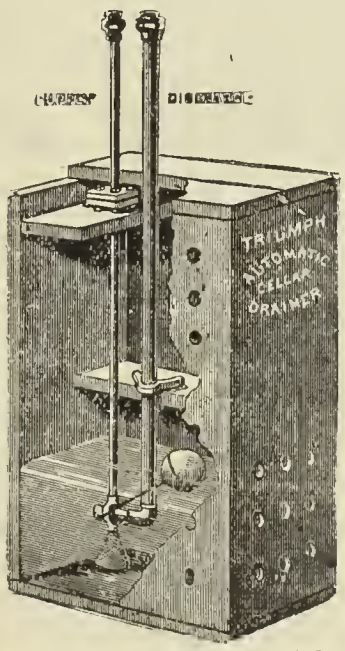
THE CONNECTICUT PLATING CO.,

No. 217 NORTH TENTH ST., PHILADELPHIA.

Electro-Platers in Gold, Silver, Nickel and all other metals.

Grinding, Polishing, Oxidizing, Lacquering, &c

Our Specialty, Electro-Bronzing Heavy Castings for Architectural and other work. Estimates cheerfully submitted.

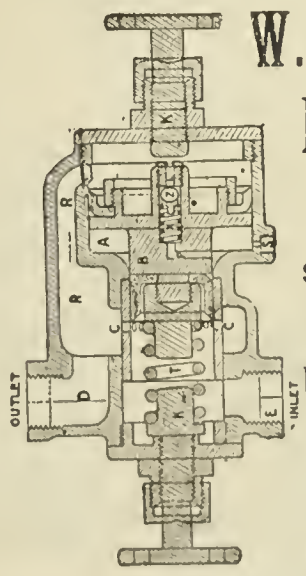


A SURE CURE FOR Wet Cellars.

THE Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Write for circular, price list and glit-edge testimonials. Correspondence solicited. Please mention this paper.

FRIEDENWALD BROS., 216 N. Holliday Street, BALTIMORE, MD.



W. G. Taafel's Pressure Regulator.

Send for Price-List.

NEWARK REGULATOR COMPANY

Newark, Ohio.

— THE —

KELLY SHOWER BATH RING.

Patent Applied For.



It Will Produce Better Results Than a $100 Shower Bath.

For particulars write

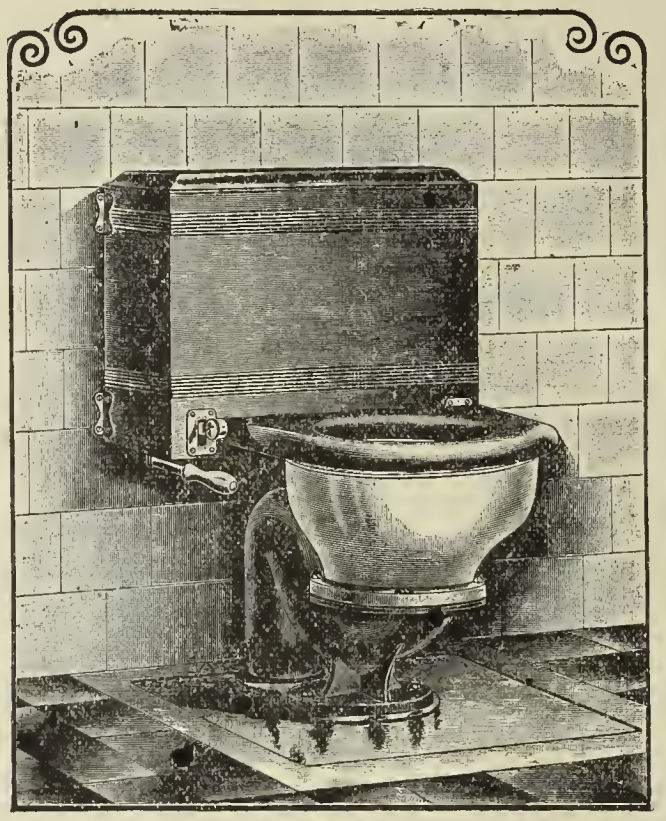
Thos. Kelly & Bros.

Manufacturers of Permanent Plumbing Goods,

124 Franklin St., CHICAGO.

AN IMPORTANT FIXTURE.

A new Water Closet for Hospitals, School Houses and Public or Private Buildings.



THE

Puritan Wash-Down Water Closet.

PATENTED.

WHY THE PURITAN WASH-DOWN IS BETTER THAN ANY OTHER FORM OF CLOSET.

It is simple and compact. The Tank being counected directly to the closet does away with unsightly pipes on the wall and reduces the noise to a minimum, and at the same time being more effective and has a larger surface of water. The joint where the earthenware connects with the soil pipe is under water, which is an absolute safeguard against the leaking of sewer gas. It is especially adapted for fire-proof buildings, and the soil pipe can run on the floor either in front or behind the partition. There is no chance for stoppages and there are no concealed spaces, all parts being accessible.

The body of the closet is made of vitreous or non-absorbing ware and is perfectly sanitary.

GOOD FIXTURES ARE CHEAP, AND POOR FIXTURES ARE EXPENSIVE.

Each Closet is guaranteed for a term of years. Call and see the operation of the Closet at our **SHOW ROOM.**

DALTON-INGERSOLL COMPANY,

169 to 175 High Street (Fort Hill Square), Boston, Mass.

CHICAGO BRANCH : 65 Washington St., Institute of Building Arts.

NEW YORK AGENCY : C. Hoffman, Jr., 277 Pearl St

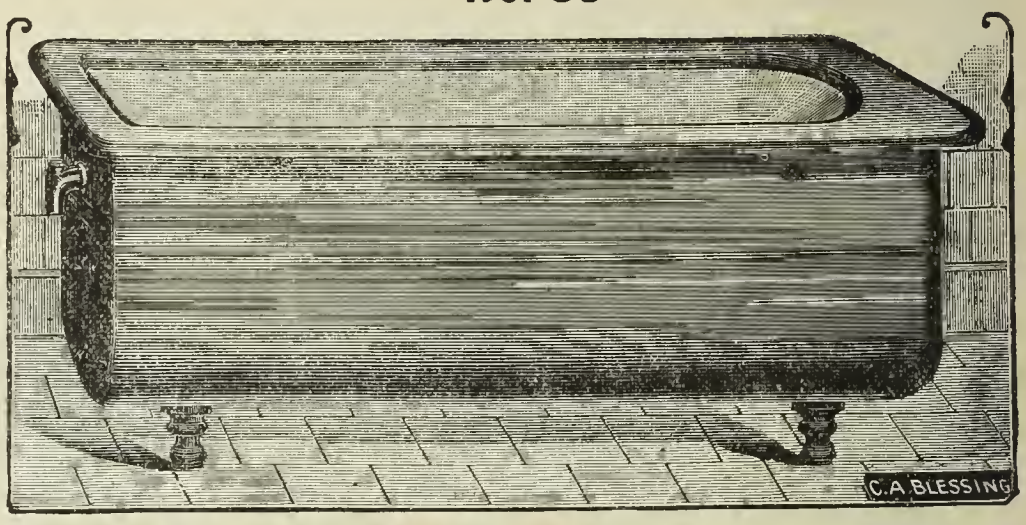
BLESSING'S HARDWOOD TUB, Round Bottom.

No. 53.

A handsome open fixture at reasonable price. Suitable for the finest Bathrooms.

Made in any finish desired, and of twelve different styles.

Write for Catalogue and prices.

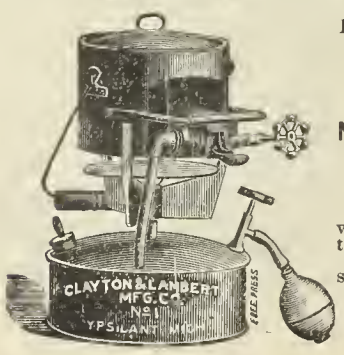


C. A. BLESSING, MANUFACTURER OF

Fine Plumbing Goods and Sanitary Specialties,

Montgomery Ave., 6th to Randolph Sts., PHILADELPHIA, PA.

Look Here, Tinners, Roofers and Cornice Makers!



Be up with the Times. The Master Mechanic of to-day is he who uses the Latest Improved Method and Tools.

No. 1 FIRE POT IS THE BEST FIRE POT ON EARTH.

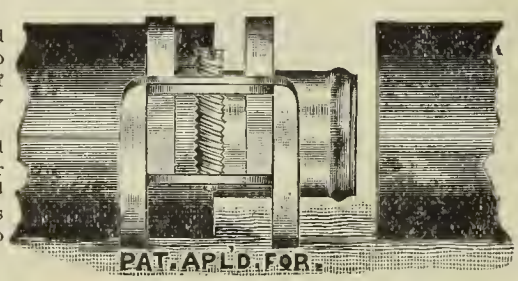
They will not blow out in the heaviest wind, and will heat the heaviest irons faster than any man can use them.

Sold by Johhers everywhere or will be shipped direct on receipt of $6.00.

CATALOGUE FREE.

Double Cinch Hose Band and Mender.

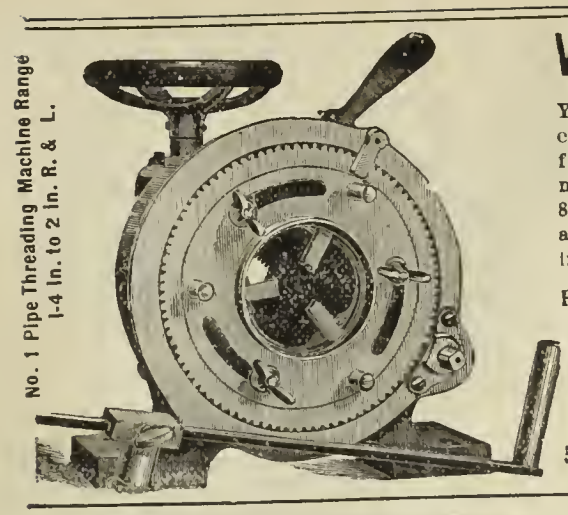
One Band and Tube do the work of two of any other make a knife and screwdriver being all the tools needed to apply it.



Mender tubes are seamless brass, give full water way, are easily inserted and will not rust Sold by Johhers everywhere Write for circular and *free sample*

Clayton & Lambert Mfg. Co.,

30 Washington St., - Ypsilanti, Mich.



No. 1 Pipe Threading Machine Range 1-4 in. to 2 in. R. & L.

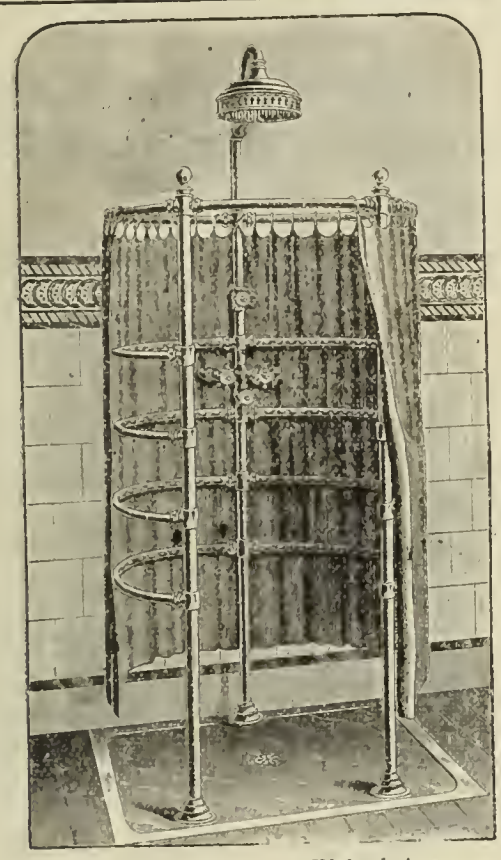
When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.



Peck Bros. & Co.,

MAKERS OF

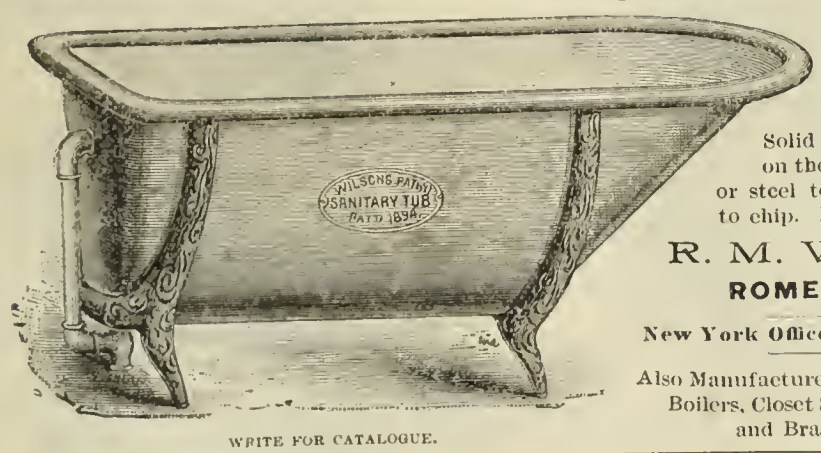
Fine Sanitary Brass Work and Sanitary Fixtures of only Highest Grade.

HAVE YOU OUR CATALOGUE.

This reduced cut, Fig. 218, is only one of hundreds of others

47 Cliff St., NEWYORK. 259 Wabash Ave. CHICAGO. 127 Chestnut St., NEW HAVEN CT. 65 Oliver St., BOSTON.

R. M. Wilson's Solid Copper Bath Tub.



WRITE FOR CATALOGUE.

Success assured to all who handle the Wilson Patent Sanitary Bath Tub. The only Solid Copper Bath Tub on the market. No iron or steel to rust. No enamel to chip. Manufactured by

R. M. WILSON,
ROME N. Y.

New York Office, 92 Walker St.

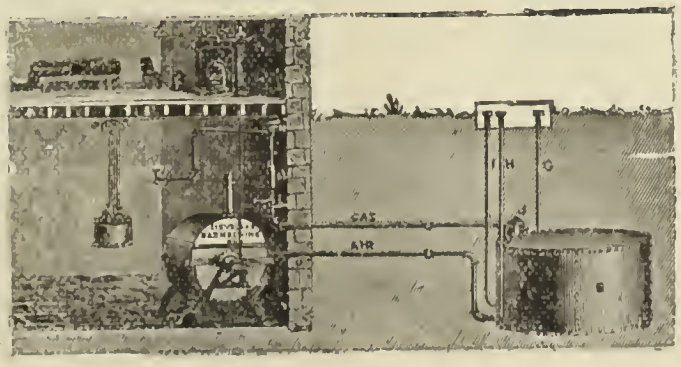
Also Manufacturer of Copper Range Boilers, Closet Seats and Tanks and Brass Work.

CLEVELAND GAS MACHINE CO.

62 Champlain St., Cleveland, Ohio.

Please send for **Reduced Price** List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engives.



BROUGHTON SELF-CLOSING

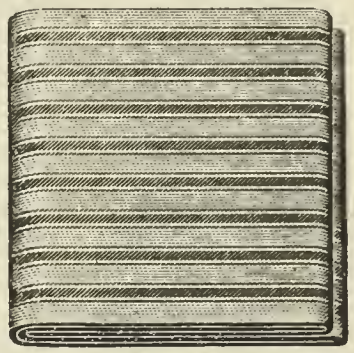
COCKS.

EVERY ONE WARRANTED.



Send for Circular.

E. STEBBINS MF'G CO. Sole Manufacturers
BRIGHTWOOD. MASS.



"Columbia" Wiping Cloths

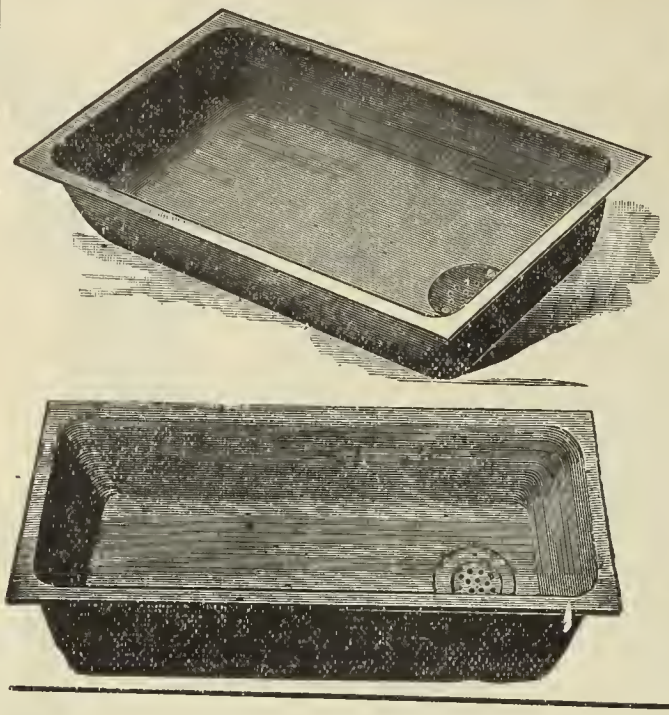
FREE!

Not free exactly from a financial standpoint (altho' very near it), but free from all defects due to **a Poor Quality of Ticking, Carelessness in Making and a Bungling Manner of Fastening the Ends.** A cloth free from the above defects is well worth the price we ask, 12 cents each, or six for 70 cents. Remember we make any kind—send us the size you want, giving the wiping edge first.

THE J. W. CHAMBERLAIN CO.,
Plumbing & Steam Fitting Specialties,
BANGOR, MAINE.

— "I WONDER why Maxim's flying machine is so long about getting out?" queried the scientific boarder.

"As near as I can figure it out," said the Cheerful Idiot, "the trouble seems to be a defective flew."—*Cincinnati Tribune.*



EVERY PLUMBER

Knows a good thing when he sees it. That's why they all use The Columbus and New Era Wrought Steel Sinks. No absorption, no smell, no breakage. Cheap and light. Write for prices.

THE

Kilbourne and Jacobs Man'fg Co.

Columbus, Ohio, U. S. A.

THE BOWER

SEWER GAS TRAP.



A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

SIMPLE, CHEAP.

EFFECTIVE and DURABLE

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 48-page pamphlet sent free on application.

B. P. BOWER & CO.
Manufacturers,
Cleveland, Ohio

INDESTRUCTIBLE.

THE STEEL CLAD BATH.

INEXPENSIVE.

It is so lined that it will not crack, nor split; neither can it rust.

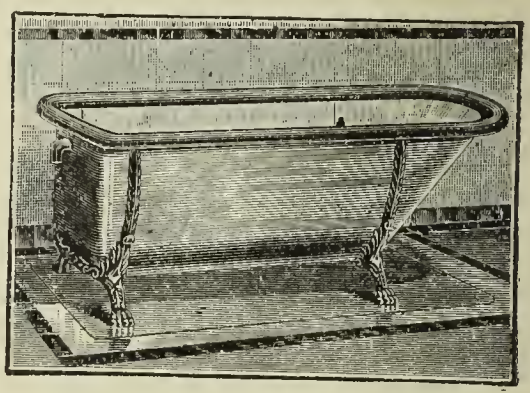
No trouble at all to keep it clean, for it cannot harbor dirt nor vermin. It is an open sanitary fixture, no wood but the rim; unbreakable, light, artistic, low priced.

Don't buy an imitation—get the **Steel Clad.** All plumbers and jobbers have it, or the

STEEL CLAD BATH CO. OF NEW YORK,
447 to 453 W. 26th St., New York City.
W. C. TRAGESER, President.

STEEL BATH MFG. CO.,
Detroit, Mich.
GEORGE BOOTH, President.

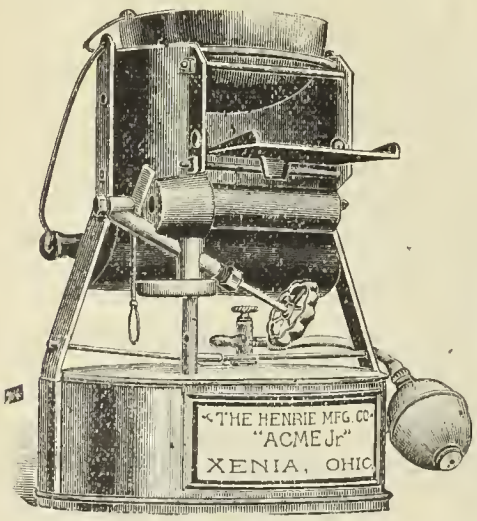
It cannot draw verdigris as an all copper tub must.



ACME, JR.,

For TINNERS and PLUMBERS.

The newest, simplest and best of them all; will burn anywhere and positively won't leak. Can be used equally well for Melting Solder Joints, Heating Irons, Burning Paint, etc. Write for complete description and price Weighs but six pounds complete.



THE

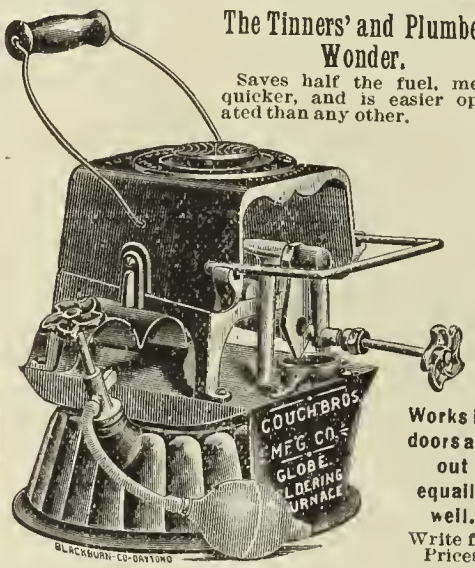
HENRIE MAN'F'G CO.,

XENIA, O.

GLOBE SOLDERING FURNACE.

The Tinners' and Plumbers' Wonder.

Saves half the fuel, melts quicker, and is easier operated than any other.



Works indoors and out equally well.

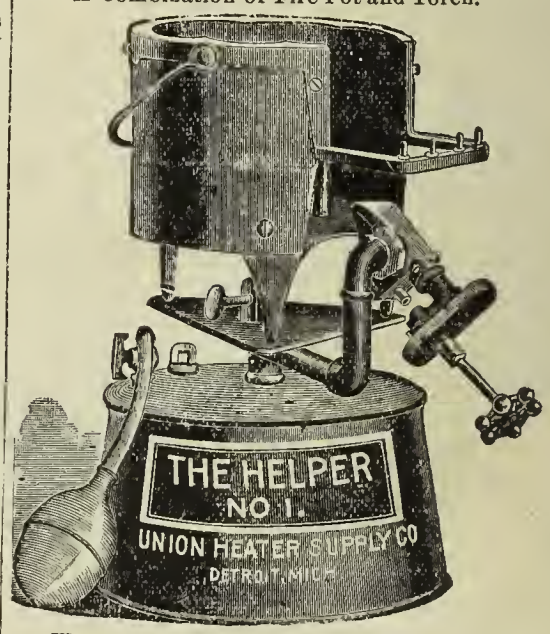
Write for Prices.

COUCH BROS. MFG. CO., DAYTON, O

Helper Fire Pot

FOR PLUMBERS' AND TINNERS' USE.

A Combination of Fire Pot and Torch.

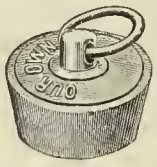


The only pot where the burner is on a swivel and patented.

The only fire pot with 16 gauge brass tank. All our goods guaranteed.

SEND FOR CATALOGUE.

UNION HEATER SUPPLY CO.,
88 Congress St., East, Detroit, Mich.



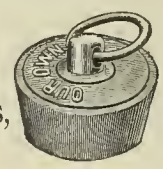
USE "OUR OWN" BASIN PLUGS.

NO OTHER LETTERING ON THEM.

SAMPLE DOZEN ASSORTED $1.

Best Quality. Handsomely Nickeled.

H. O. CANFIELD,
MANUFACTURER OF
Moulded Rubber Goods,
BRIDGEPORT, CONN.



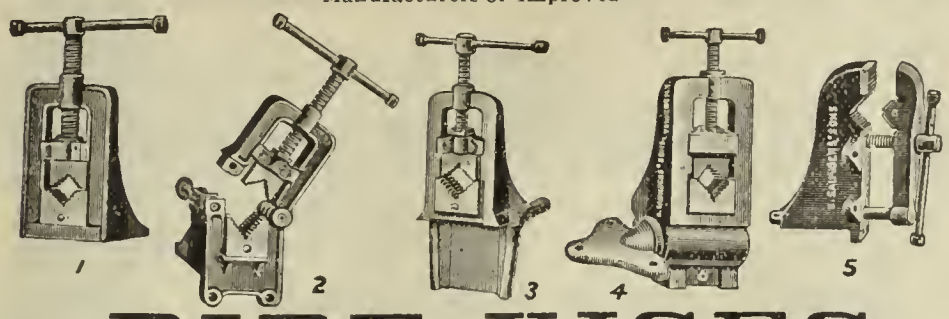
— INDIGESTION.—The little girl was nursing her dolly very carefully.

"Is dolly sick?" asked the child's mother.

"Yes, mamma. The poor little sing can't digest all 'at sawdust what she's eated."

D. SAUNDERS' SONS,

Manufacturers of Improved



PIPE VISES

of all styles and sizes holding ⅛ in. to 8 in. pipe, made of MALLEABLE IRON, CAST IRON and STEEL Also PIPE THREADING MACHINES ¼ in. to 16 in., Hand Pipe Cutters, Stocks and Dies, Tapping Machines, etc. Send for catalogue to

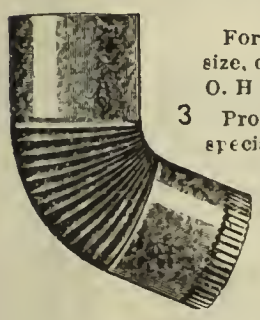
27 Atherton Street, Yonkers, N. Y.

The "O.H." One Piece

PLAIN ROUND and CORRUGATED

CONDUCTOR AND STOVE PIPE ELBOWS.

(PATENTED OCT. 25, 1892.)

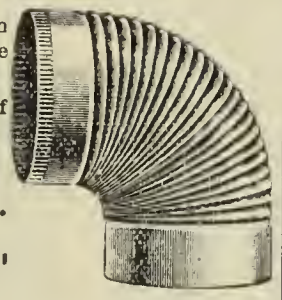


For extreme durability and strength, precision in size, quality of material and handsome design, the O. H is unequaled.

3 Prompt attention given to the manufacturing of special elbows of any size, angle or material.

WRITE FOR PRICES.

For Sale by all First-class Jobbers.

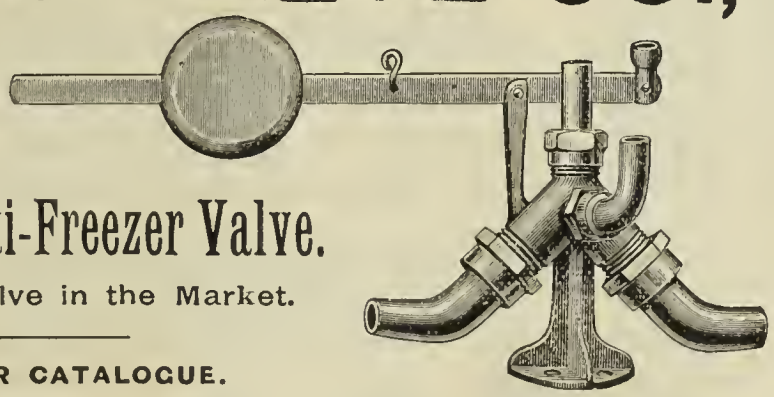


THE LAWRENCE-LETTS ELBOW CO., Ltd.,

WAVERLY, N. Y.

ZERO VALVE CO.,

304 Seneca St.,
BUFFALO,
N. Y.



Vollmer Anti-Freezer Valve.

Cheapest Valve in the Market.

SEND FOR CATALOGUE.



BURGESS GEM No. 6.

Electricians', Plumbers' and Tinners' Furnace.

GUARANTEED to melt 12 pounds of lead in eight minutes.

GUARANTEED to heat coppers and melt lead at the same time.

GUARANTEED that if it cannot be worked out of doors or on roofs in all kinds of weather your money will be refunded.

MANUFACTURED BY Burgess Soldering Furnace Co.,

COLUMBUS, OHIO.

Leather and Rubber

WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

Ruggles St., Boston, Mass.

COLWELL LEAD COMPANY,

Centre Street, and 681 Sixth Avenue, Cor. 30th Street, NEW YORK.

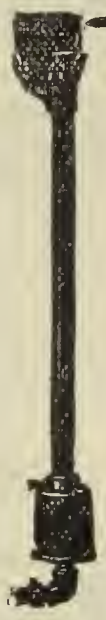
LEAD PIPE, SHEET LEAD, SHOT,

Plumbers' Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order.

W. & B. DOUGLAS,



Middletown, Conn.

Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON,

166 N. Fifth St., Philadelphia.

Manufacturers of

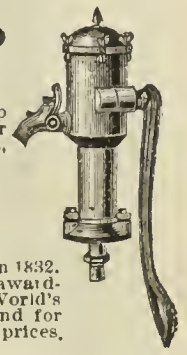
PUMPS,

Hydraulic Rams,

Garden Engines, Pump Chain and Fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.

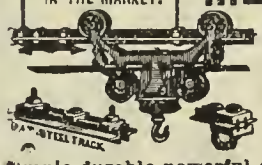


Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS

REVERSIBLE STEEL and WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS



Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue

F. E. MYERS & BRO. ASHLAND, O.

—RAPID—
Pipe Tapping Machine.



Latest and Best

Lightest and Strongest.

A simple, effective and strongly built machine. By means of which any workman of ordinary intelligence can rapidly make service connection to any water or gas main without turning off the pressure or interfering with the consumer's supply of water or gas.

Price complete for ½, ¾, ¾ and 1 in. connections, $100.00.

Liberal Discount to the Trade.

BAILEY-FARRELL MFG. CO.,

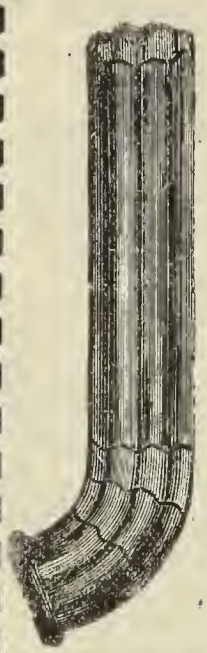
PITTSBURG, PA.



CHUCKS

The National. All sizes and styles. Patented **Reversible Jaws.** Illus. catalogue. The standard Chuck since 1882. Address W. WHITLOCK, 39 Cortlandt Street, New York.

POPULAR BECAUSE RELIABLE.



The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.



The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**





W. AUSTIN OBDYKE & CO.,

Manufacturers

Office and Works, 237, 239 and 241 Bread St., PHILADELPHIA, PA.

For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.

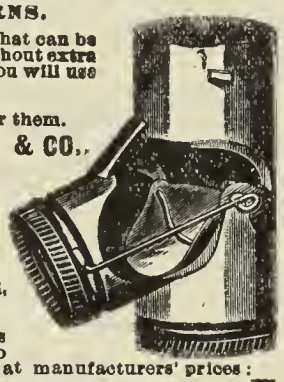
THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.

It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.



COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

6-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St. Joseph Mo.



The Climax Ratchet Stock

Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, $10.00

No. 2 threads 1 to 2 in. pipe, takes 2½, 3 and 4 in. die, $17.00

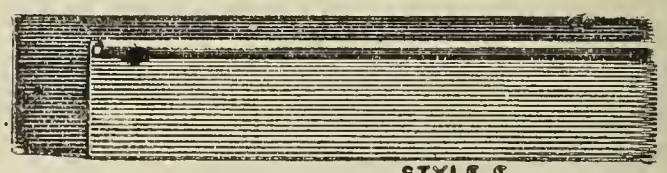
For sale by leading jobbers.

Manufactured Solely By

C. M. KEMP MFG. CO.,

Baltimore.





STYLE B.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

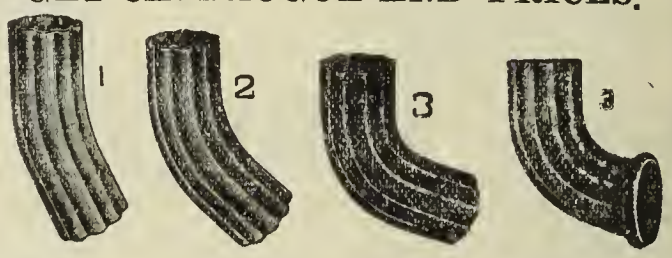
—MANUFACTURE—

PLECKER'S

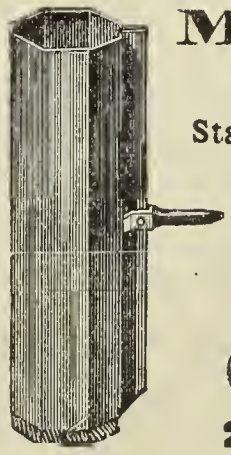
Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

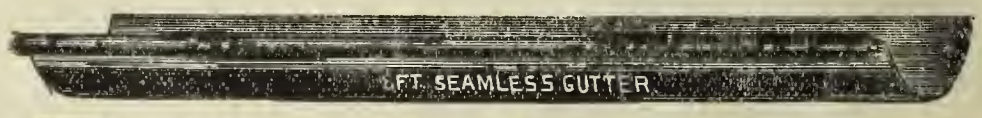
We make the best goods in the world and our prices are reasonable.

GET CATALOGUE AND PRICES.









MARLIN & CO.,



(INCORPORATED.)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

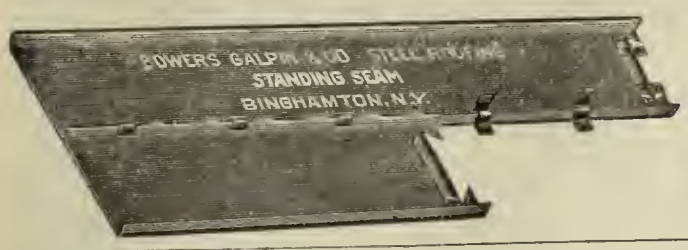
METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.

BOWERS ROOFING AND METAL WORKS.



Standing Seam and Roll Roofing.

Painted Steel, Terne and Galvanized.

—MANUFACTURED BY—

L. M BOWERS & CO., Binghamton, N. Y.

EAVE TROUGH

THE KANNEBERG ROOFING CO.,

CANTON, OHIO, U. S. A.

MANUFACTURERS OF

Patent Eave Trough and Hangers, Conductor Pipe, O. G. and Box Gutters, Ridge Roll and Capping, Ventilators, Finials, Cresting.

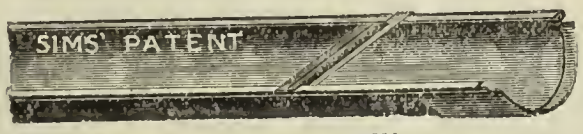
Patent Steel Roofing,* Metallic Shingles, Crimped, Beaded and Corrugated Steel, Steel Weather-Boarding, Sheet Steel Pressed Brick, Mixed Roof Paint, Building Paper, etc.†

* Write for sample.

† Get Illustrated Catalog.

CONDUCTOR Pipe.

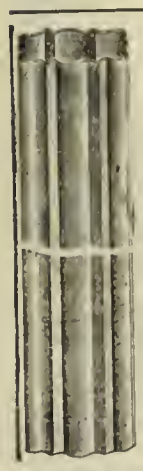
SIMS'S ADJUSTABLE EAVE TROUGH.



Pat. Jan. 14th, 1890.

Various Designs of Galvanized Sheet Steel Eave Troughs, Mitres, and Ridge Rolls, Roof Gutters, Expanding Conductors, Elbows, etc., etc.

THE SIMS MFG. CO. Sole Manufacturers, **NEWARK, OHIO**



Corrugated Expanding Conductor

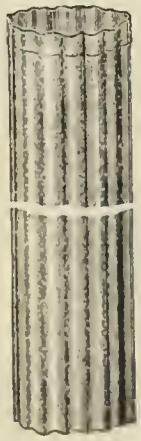
OF GALVANIZED IRON AND COLD ROLLED COPPER.



JAMES A. MILLER & BRO.,

129 and 131 South Clinton St.,

CHICAGO.



SLATE

FOR ROOFING AND BLACKBOARDS.

SLATERS MACHINES, TOOLS AND BOOK OF INSTRUCTIONS.

AULD & CONGER,

100 EUCLID AVE., CLEVELAND, OHIO.

THE IRWIN & REBER PATENT EXPANDING WATER CONDUCTOR

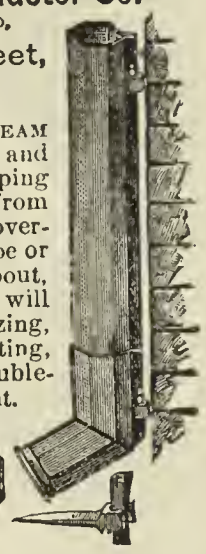
MANUFACTURED BY THE

S. S. S. Conductor Co.

LIMITED,

163 Lacock Street,

ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

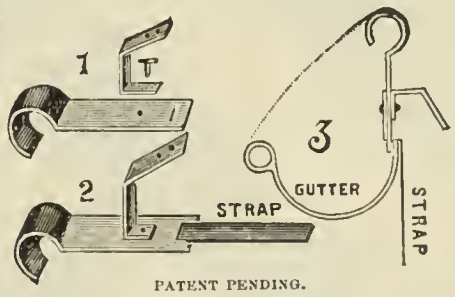


Made in 6-foot lengths of a single sheet of SOFT STEEL.

GALVANIZED, KALAMEINED or LEADED.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.

STRAP E. T. HANGER.



PATENT PENDING.

TINNER, ATTENTION!

Save the narrow strips of Galvanized Iron and Tin that you have been taking to the Dump, for the **Strap Hanger.** Any wide awake TINNER can see at a glance the saving. Cut No. 1 shows Hanger as they are packed—Gross in a Box. **$2.50 per Gross,** freight allowed.

Discount to the Trade.

MANUFACTURED BY

JOHN SEVERDING, - Richmond, Ind.

PIPE THREADING AND CUTTING OFF MACHINES, WATER, GAS and STEAM FITTERS' TOOLS, Improved Hinged Vises, Pipe Wrenches, Stocks and Dies. *Acknowledged to be the Best.*



ARMSTRONG MFG. CO.,

N. Y. OFFICE: 139 Centre St.

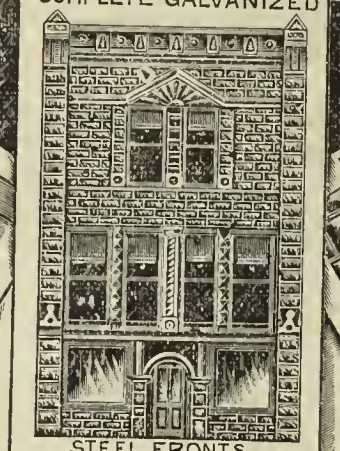
Bridgeport, Conn.

PATENTED

LONGEST EAVE TROUGH IN THE WORLD 10 FT WITHOUT A SEAM

PRESSED STEEL BRICK

COMPLETE GALVANIZED



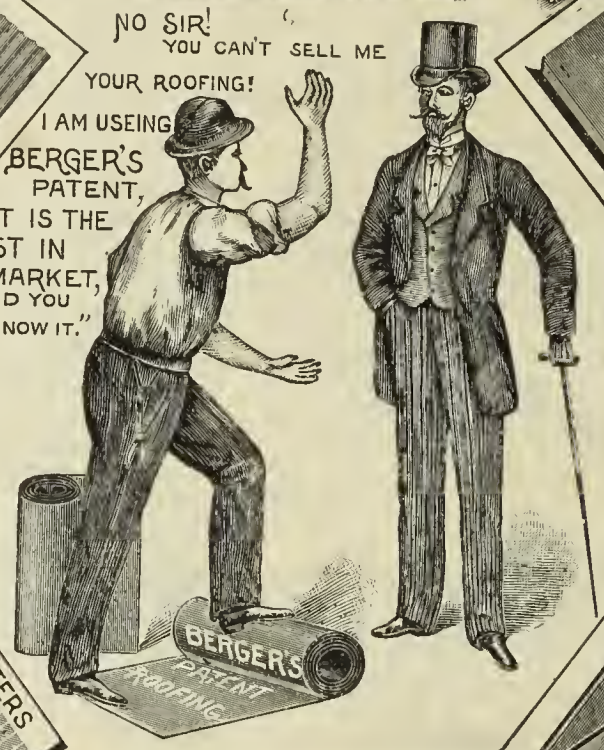
STEEL FRONTS

ROCK FACE BRICK AND STONE

CONDUCTOR

CORRUGATED IRON

NO SIR! YOU CAN'T SELL ME YOUR ROOFING! I AM USEING BERGER'S PATENT, IT IS THE BEST IN THE MARKET, AND YOU KNOW IT."



CRIMPED IRON

PLAIN ROUND

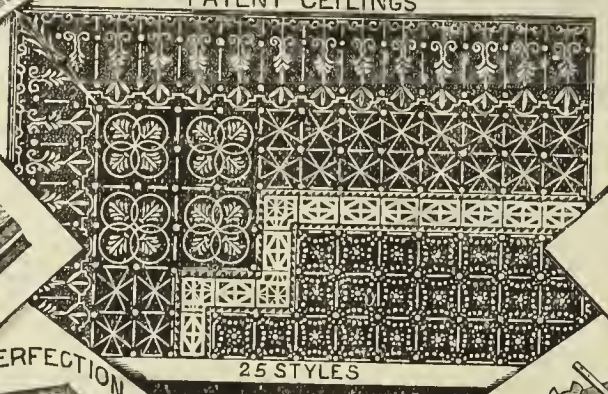
FIRE PROOF DOORS & SHUTTERS

METALLIC SHINGLES

EXPANDING

CONDUCTOR

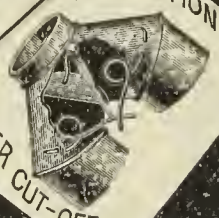
PATENT CEILINGS



25 STYLES

CORNICES AND FINIALS

PERFECTION WATER CUT-OFF



PERFECTION WIRE HANGER



IMPERIAL STEEL HANGER



SKYLIGHTS

ALL STYLES

132 PAGE Catalogue ON APPLICATION.

WRITE FOR PRICES IT WILL PAY YOU.

THE BERGER MFG. CO. CANTON, O.

IRON AWNINGS, ROOF PAINTS, WEATHER VANES, VENTILATORS, MALLEABLE IRON CRESTINGS, etc.

WESTERN AGENTS: ILLINOIS ROOFING & SUPPLY CO. CHICAGO, ILL.

READY!

After months of labor, accompanied by great expense, we have just received from the press

OUR **1895 CATALOGUE,**

which we are proud to say is the *largest catalogue* in our legitimate line *ever published.** It contains many novelties never before shown, and is a complete and up-to-date directory of supplies in our field. We are not sending it out in a "helter-skelter" fashion—it does not pay—but every **Tinner, Tinware Manufacturer, Roofer, Plumber** and **Architect** who will take the trouble to send us a postal request will receive a copy.

* Contains 128 pages, full of illustrations and designs.

BERGER BROS., Manuf'rs of Tinners' Hardware and Roofers' Supplies. 231 & 237 Arch St., **PHILADELPHIA.**

BEST IN THE WORLD.

SATISFACTION GUARANTEED EVERY TIME.

ABSOLTUELY FREE FROM WASTERS.

10 lbs. COATING.

I issue no circulars—have no samples—all I need to know is the number of boxes wanted and, most important of all,

A Check with the Order.

I deliver F. O. B. Cars Phila.

TERNE PLATE.

WARRANTED.

I want orders accompanied by a check in full payment, *not otherwise.* I am special sales agent for the

"AIMEE" BRAND Palm Oil Process.

An American Plate throughout—made of the very BEST materials I guarantee it to be a better plate than that which sells for $9.50 on credit.

MY PRICE IS:

100 Boxes.....	$8.23	per box.
50 "	8.30	"
25 "	8.37	"
10 "	8.43	"
1 "	8.50	"

Positively NO WASTERS.

Average NET weight per box, 210 LBS.
112 sheets, 20 x 28.

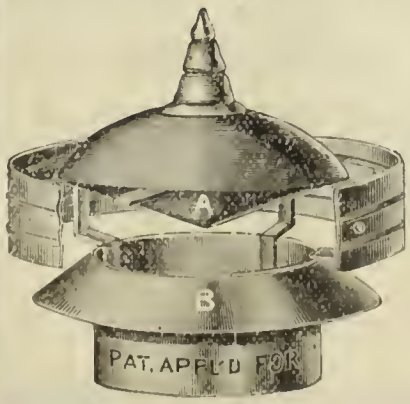
Satisfaction is Guaranteed EVERY TIME.

ADDRESS

WM. F. HARVEY, 701 GIRARD BLDG., PHILADELPHIA, PA.



IMPROVED DOME VENTILATOR AND CHIMNEY CAP.



For Smoky Chimneys and Imperfect Flues. It is made of refined Iron, and galvanized after it is made up. It will work at any angle. For Ventilation of Cars, Churches, Factories, Schools, Stables, Breweries, Ice Houses, Steamboats, or wherever circulation of air is necessary. This is the only ventilator of this class which has a conical shaped deflecting cone A on inside, and deflecting cape B on outside, making it much superior to other styles.

Mfrs of Plain, Painted or Galvanized Corrugated Sheets, SIDING, ROOFING, CEILING, &c., &c.

Galvanized and Plain Steel and Iron Sheets, Bars, Hoop and Band Iron, Nails, Spelter, Lead, Tin, &c.

Galvanized Riveted and Corrugated Leader, cheapest and best in the market. Sheet Iron Piping, Stove Pipe and Fittings of every description.

GENERAL GALVANIZING TO ORDER.

THE JERSEY CITY GALVANIZING CO,

Galvanized Material of Every Description.

Works, Jersey City. Store, 112 John St., New York.

SEND FOR CATALOGUE OF OUR SPECIALTIES.

Phelps, Dodge & Co.,

11 Cliff St., New York.

Dealers in { AMERICAN AND IMPORTED. } TIN PLATES.

Sole Agents for { NEW CASTLE American Tin Plates.

Also Importers and Dealers in { PIG TIN, COPPER, SHEET IRON, LEAD, ZINC, ANTIMONY.

Also the Celebrated Phelps' Treble Coated Roofing Plate.

FOLLANSBEE BROTHERS COMPANY,

Successors to

James B. Scott & Co.,

TIN PLATE,
SOLDER,
ZINC,
All Descriptions of

SHEET IRON ROOFING IRON

TOOLS & MACHINES FOR TINNERS

Sole Factors of the Blairsville Rolling Mill and Tin Plate Company.

122 and 124 Second Ave., Pittsburgh, Pa.

CHAMPION of the WORLD.

(No reference to Mr. Corbett.)

In our "PENNSYL" OLD METHOD Terne Plate we have the Champion of all Champions *Roofing Plate*, a fact which is fully borne out by **Architects, Roofers and Builders.**

When we first introduced the "Pennsyl" it was with the intention that it should *always* be the Best and Leading Brand of Roofing Tin made, and it certainly is.

Just to think, every box contains *45 lbs.* of Pure coating. Other brands that are put in competition only have 30 to 36 lbs.

Every sheet guaranteed perfect in every way.

Every sheet stamped and squared.

We put it on the market in 1879 and we have been selling it continually since.

GUMMEY, SPERING & CO.,

Manufacturers and Importers Tin Plate, Metals, &c.

PHILADELPHIA, U. S. A.

Beware of a Brand on the market *simply called* "Old Method," it is a poor imitation, and intended only *to deceive.*

ÆTNA-STANDARD IRON & STEEL CO.,

MANUFACTURERS OF

Black Sheets, Galvanized, Corrugated, Tin and Terne Plates,

Sheets Suitable for All Purposes, Cold Rolled or Common, Patent Leveled and Other Specialties, Roofing and Building Supplies.

Bars, Light Structural Shapes and Rails.

Bars, All Sizes and Qualities, Angles, Tees, Channels, Steel Tire and Toe Calk. Special Sizes and Shapes Made to Order.

LARGE STOCKS CARRIED TO FACILITATE PROMPT SHIPMENT.

Write for Catalogue and Prices. **BRIDGEPORT, OHIO.**

REMEMBER—**At the same address, with larger stock than ever.**

MERRY'S OLD METHOD

Roofing Plate.

STAMPED, SQUARED AND GUARANTEED.

GEORGE E. MERRY, Successor to John Merry & Co.,

535 to 547 West 15th Street, New York.

P. B. CALVERT & CO.,

IMPORTERS OF

TIN PLATES AND METALS

Philadelphia, Pa.

MANUFACTURERS OF

American Tin Plates,

MEURER BROS. CO.,

Send for Prices. **Brooklyn, N. Y.**

JOSEPH C. KENT, President. **GEORGE DANBY, Sec'y and Treas.**

AMERICAN SHEET IRON COMPANY,

—MANUFACTURERS OF—

SHEET IRON AND SHEET STEEL,

Including Light Black Plates for Tinning, Stamping, &c.

ROLLING MILLS AND MAIN OFFICE: PHILLIPSBURG, N. J. **SALES OFFICE: HAVEMEYER BUILDING, 26 Cortlandt St., New York.**

THE PHILLIPS TIN PLATE CO., Philadelphia, Pa.

"**F. R. P. EXTRA.**" Treble coated. Oil Finish. Guaranteed to carry 45 lb. coating.

"**PHILLIPS ROOFING.**" Extra heavy. Bright finish. " " 35 lb. "

"**BOSTON.**" Heavy Spangled Terne. Guaranteed to carry 20 lb. coating.

"**NATIONAL.**" (Worcester grade.) " " 10 lb. "

TIN PLATE

FIVE GRADES OF **BRIGHT.**

TWO GRADES OF **BOILER SIZES.**

FURNACE PIPE SIZES. COKES IN MANY ODD SIZES.

GOLDEN STAR REDIPPED TISSUE PACKED.

J. M. & L. A. OSBORN, - CLEVELAND, O.

"REMOVAL."

We will remove about April 1st from 247 Pearl St to the five story building

245 & 247 Water Street.

Increased floor space, larger stocks and better facilities will enable us to make

PROMPT DELIVERIES.

MERCHANT & CO., Inc., = = New York City.

"MORTON" CHARCOAL "GUERNSEY" COKE "LEATHERWOOD" TERNE

When these brands are once used they will sell themselves. They are manufactured under improved methods of an old reliable palm oil process

GOOD HONEST PLATES

NO DESTRUCTIVE MATTER IS USED IN THIS PROCESS

THESE PLATES WILL LAST

TIN PLATES

MANUFACTURED BY

THE MORTON TIN PLATE CO.

CAMBRIDGE, OHIO.

NEW CASTLE

New Castle Steel and Tin Plate Co., New Castle, Pa.

AMERICAN

BRIGHT TIN AND TERNE PLATES

Made at our Extensive Works direct from

LAKE SUPERIOR ORES.

Equal to the "Best in the World," If you don't believe it send for samples.

REPUBLIC IRON WORKS.

PITTSBURGH.

MANUFACTURER OF

Kalameined & Galvanized Sheet Iron.

Also,

JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

PALM OIL

BRANDS:

"Cecelia" Clarified Palm,
"Lagos" Palm,
"Choice Red" Palm,
"Brown" Palm.

☞ "Cecelia" Clarified Palm Oil is prepared by us especially for Tin Plate Manufacturers, and is clarified in order to remove moisture, grit, and free acid to the minimum, thus making it the safest and surest oil to use.

LAMBERT, STOUGHTON & COOPER,

IMPORTERS AND PRESSERS OF OIL,

117 Walnut St, PHILADELPHIA, PA.

To Hang Up In The Shop.

Metal Worker

Shop Card No. 3,

GIVING A TABLE OF

Diameters, Areas and Circumferences of Circles, with directions for use; also a table for the conversion of vulgar fractions into decimals, and one for the conversion of inches and eighths into decimals of a foot.

Size, 10½ x 14 inches. Price 30 cts.

Sent, postpaid, on receipt of price by

DAVID WILLIAMS, Publisher,

96 102 Reade St., New York.

Galvanized Gutter.

Galvanized Down Spout

CORRUGATED,

V-Crimped and Roll-Cap Steel Roofing, Weatherboard and Steel Brick Siding.

E. E. SOUTHER IRON CO.,

ST. LOUIS, MO.

Bell's Galvanized Wire Eave Trough Hanger.

Sold by Jobbers. Sample of any size and descriptive circular free.

Made in 9 sizes. It is neat, strong, durable, easily put on and cheap.



Deservedly popular. Constantly growing in favor. Special price for sample order. Write us.

JOHN W. BELL & CO., Sole Mfrs., Mercer, Pa.

CHAS. A. CONKLIN MANUFACTURING CO., General Southern Agents, Atlanta, Ga.

ROOFING PLATES, all Grades

BRIGHT PLATES, Charcoal and Coke.

American and Foreign.

A Large Assortment of Qualities, Weights and Sizes.

SHEET IRON.

B B GALVANIZED,
CHARCOAL CLEANED,
COLD ROLLED,
COMMON.

Galvanized and Terne Eave Trough and Gutter.

Corrugated Leader, Elbows and Shoes.

SOLDER—A Specialty, our own make.

Tin, Pig and Bar, **Sheet Zinc,**
Lead, Pig and Bar, **Sheet Copper,**
Ingot Copper, **Iron Lathing,**
Antimony, **Wire.**
Hard Metal, **Rivets.**

Also a large assortment of TINNERS' TOOLS and MACHINES, and a full line of other goods for Spring trade.

BRUCE & COOK,

186, 188, 190 Water St., 248, 250 Pearl St., } New York.

Orders and inquiries solicited.

McDaniel & Harvey Co.,

SHEET IRON MANUFACTURERS,

SIXTEENTH STREET AND WASHINGTON AVENUE, PHILADELPHIA.

Best Charcoal Bloom Galvanized Sheet Iron, "McCullough Iron Co." Eagle Brand.

Galvanized Corrugated, straight or curved. **Harvey's Patent Cleaned Black Iron.**

Painted Corrugated Roofing and Siding.

ALAN WOOD COMPANY,

MANUFACTURERS OF

Patent Planished, Galvanized, Common, Best Refined, Cleaned and

CHARCOAL BLOOM SHEET IRON.

No. 519 ARCH STREET, PHILADELPHIA, PA.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smokestack, Last Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

WE GUARANTEE FULL SIZE AND WEIGHT.

SEND IN FOR YOURSELF
And if you don't find it as we say you may send it back at our expense.

Rhodes, Dickelman & Co.,
FOREST, OHIO.



Write for Prices and Discounts.

WHY
Use a Single Bead when you can buy a Double Bead for the same price?

DON'T BELIEVE IT WHEN THEY TELL YOU DIFFERENT.

ILLINOIS ZINC COMPANY,
MANUFACTURERS OF
SPELTER AND SHEET ZINC
PERU, ILLINOIS.

ROOFING
Steel, Iron, Felt, Ready Rock Asphalt, etc.
Steel and Iron Siding, Building Paper, etc., etc.
THE KANSAS CITY METAL ROOFING & CORRUGATING CO.,
416 DELAWARE STREET, KANSAS CITY, MO.

THORN'S PATENT METALLIC ROOFING
TILES AND SPRING-LOCK SHINGLES.



THE BEST, MOST HANDSOME, DURABLE AND SECURE ROOFING PLATES YET OFFERED TO THE BUILDING TRADE.

Indorsed by All the Leading Architects.

Our system differs from all others in existence. We keep a complete stock of *eight designs of tile and two sizes of shingles.* Our tiles are a marvel of beauty and have the most secure and most practical side-lock ever invented.

Send for illustrated catalogue and circular.

THORN SHINGLE & ORNAMENT CO.,
1221 Callowhill St., Philadelphia, Pa.

THE PHILADELPHIA STEEL ROOFING CO.
MANUFACTURERS OF
STEEL ROOFING AND CORRUGATED IRON,
514, 516 & 518, BEACH ST.
PHILADELPHIA PA.
SEND FOR CATALOGUE AND PRICES.

At this time of the Year

metal workers are busy fixing furnaces, steam pipes, etc. Dixon's Graphite Pipe Joint Grease will make a better joint than red or white lead and parts can be separated easily even years after. When used on valves it does not harden or cause the valves to stick. Send for circular and sample.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Pontymister Old Style Ternes.
Best and Heaviest Coated Roofing Plate made. Guaranteed Coating of **40 LBS.** per box 28 x 20.

To Be Had of All Dealers.

DATED 1892
CORRUGATED CONDUCTOR HOOKS AND TINNERS' SUPPLIES
SEND FOR CATALOGUE
59 NTH 2ND ST
L.D.BERGER. PHILADA PA

Hicks' Guide
FOR
Builders,
Comprising an easy, practical system of Estimating Materials and Labor for Carpenters, Contractors and Builders.

A comprehensive guide to those engaged in the various branches of the building trades.

By I. P. HICKS.

160 Pages. - 114 Illustrations.

Bound in Cloth, Price, - $1.00

This book presents to the trade, first, an easy, practical system of estimating materials, in concise form for reference. In the next place is given the average day's work of all kinds, and the average rates on which to figure in almost every detail of building construction.

Material and Labor, including Lumber, Carpentry Work Masonry, Plastering, Hardware, Painting, etc., are among the principal divisions. These in turn are illustrated and ably treated under numerous sub-divisions, showing step by step the entire work of estimating, contracting and building, together with the best and most practical methods of doing the work.

This is followed by a section given to the Geometrical Measurements of Roof Surfaces, with numerous illustrations and examples. It embraces a new and simple system of framing curved roofs, also the simplest methods of roof framing of every description, with practical examples thoroughly illustrating nearly every conceivable form of roof and showing many points never before presented.

The volume also contains a chapter on Mitering Planceers, Moldings, etc., illustrating and describing how to make, in an easy, practical manner, many joints which are the source of no little trouble and annoyance on the part of the workman.

SENT POST-PAID BY

DAVID WILLIAMS, Publisher and Bookseller,
93-102 Reade St., N. Y.

AMERICAN BRAND

Corrugated Iron.
Standing Seam Steel Roofing.
Down Spouts.
Paints and Cements.
Roll and Cap Steel Roofing.
"V" Crimp Steel Roofing.
American Metallic Lathing.
Sheet Steel Clapboards.
Sheet Steel Pressed Brick.
Sheet Iron Shutters.
Galvanized Gutters.

AMERICAN ROOFING CO.,
ST. LOUIS and CINCINNATI.

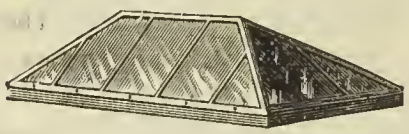
Mention this paper.



JAMES A. MILLER & BRO.,
129 and 131 S. Clinton St., Chicago,
MANUFACTURERS
Galvanized Iron Cornices and Window Caps.



SHEET METAL SKYLIGHTS



Owing to increased facilities (secured to enable us to fill our World's Fair contracts), we can make specially low prices on Skylights.

CORRUGATED { *Iron Roofing.* / *Conductor Pipes.*

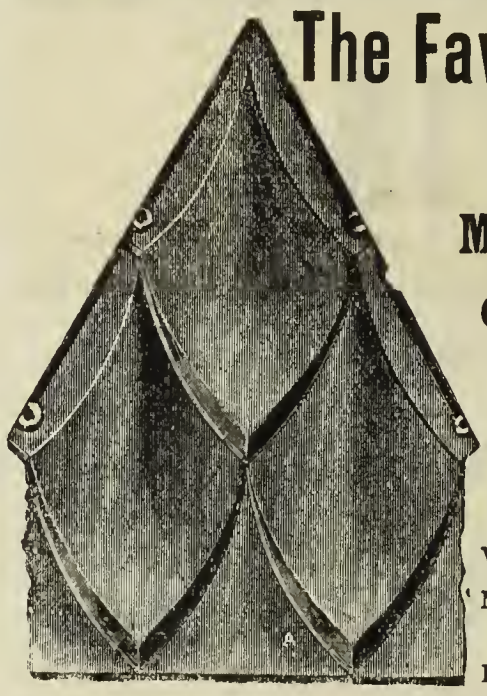
See other Advertisement in this Paper.

RASNER & DINGER



Manufacturers of HAYES' PATENT
Metallic Sky-Lights,
Galvanized Iron Cornices and all kinds of Architectural Sheet Metal Work, Tin and Iron Roofers.
Second Ave. & Ferry St., Pittsburgh, Pa.

JOHN SANBORN,
Dealer in Metals,
and manufacturer of Refined Metal Solder, Wire Solder, Plano Key Leads, Babbitt Metal, Pig and Bar Lead,
217 WATER STREET,
Near Beekman Street, NEW YORK.



The Favorite Metal Shingle
EASTLAKE.
MONTROSS PATENT.
GOTHIC and DIAMOND TILE.
Unequaled for Beauty and Excellence.

SEND FOR CIRCULAR.

W. J. BURTON & CO., Detroit, Mich.
MONTROSS METAL SHINGLE CO., Camden, N. J.
E. VAN NOORDEN & CO., Boston, Mass.



GAIUS PADDOCK, Pres't. GUSTAV MILLER, Secretary. GEO. A. BANANTINE, Vice Pres't.
ST. LOUIS CORRUGATING CO.,
—MANUFACTURERS OF—
SHEET METAL ROOFING, SIDING AND CEILING
—OF ALL DESCRIPTIONS FROM—
SHEET IRON OR STEEL, EITHER BLACK, PAINTED OR GALVANIZED.
Up-Town Office, Paddock-Hawley Iron Co., 515 North Main Street.
Factory 113 to 133 Soulard Street, ST. LOUIS, MO.

No. 8, Large Hole.



Full Size. CONCAVE.

LEAD WASHERS
FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

No. 12, Small Hole.



Full Size. CONCAVE.

They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices.
LITTLEFORD BROS., SOLE MFRS., 139 to 141 E. Pearl St., Cincinnati O

Globe IRON ROOFING AND Cor'g Co.,

STEEL ROOFING AND SIDING.

Operating Rolling Mills and producers of all styles and gauges of Corrugated, Standing Seam and Crimped Steel Roofing. Special discounts to the trade. Write for estimates or prices

Cincinnati, O.



CARRY IRON AND STEEL ROOFING CO.,

CLEVELAND, OHIO.

MANUFACTURERS OF THE

CELEBRATED CONTINENTAL METALLIC SHINGLE ROOFING!

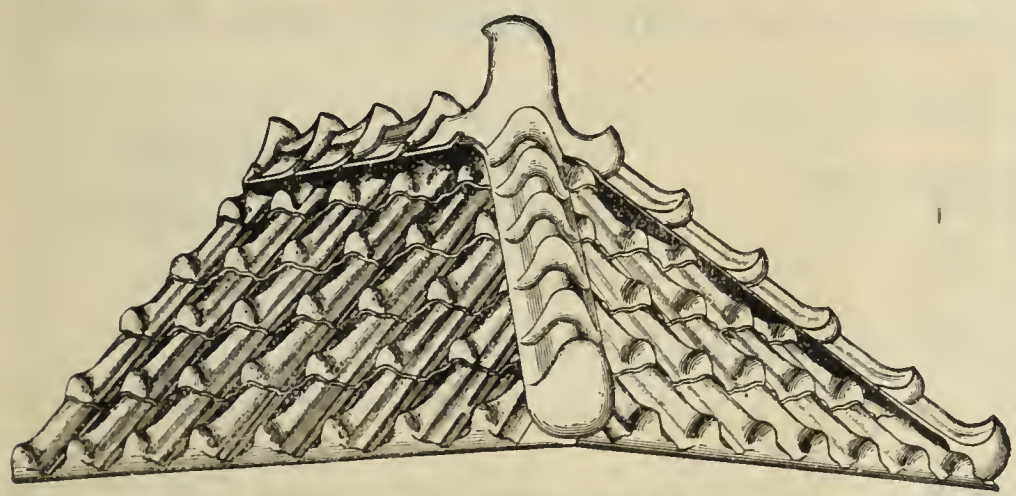
Designed for the better class of buildings, such as Residences, Churches, Public Buildings, etc. Also Swiss Cottage and Diamond Shingle, designed more especially for Fancy Siding, Gables, Towers, etc.

These Shingles are made of painted Bessemer Steel, bright and painted Tin and galvanized Steel.

Send for Catalogue and Price-List for 1895.

Mention THE METAL WORKER.





TILE ROOFING.

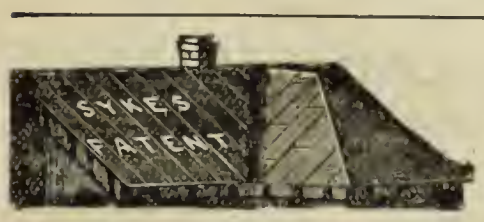
Made of COPPER, GALVANIZED IRON and BLACK STEEL.

The most artistic and durable roof on the market; guaranteed storm proof; made in large sheets, very easily and quickly applied. The accompanying cut shows the "American." Catalogue showing many designs on application. Write for prices.

W. H. MULLINS,

106 DEPOT STREET, - - SALEM, OHIO.

Eastern Office, 108 Chambers St., New York City.



WORLD'S FAIR AWARD.

We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price-List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - - Chicago and Niles, O.

James A. Miller & Bro.,

129 and 131 South Clinton St.,

CHICAGO,

MANUFACTURERS

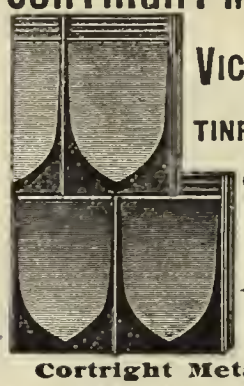


FOR

ROOFING AND SIDING.

Send for Circular and Prices.

CORTRIGHT METAL SLATES and VICTORIA SHINGLES



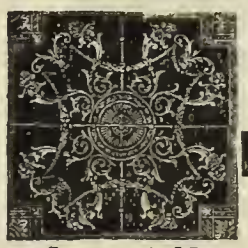
Made of TINPLATE, (Full Weight Only)

Galvanized Steel and COPPER

Prices and Samples Free on Request.

Cortright Metal Roofing Co.

Main Office and Factory, Broad & Hamilton Sts., Phila.
Western Office, 134 Van Buren Street, Chicago.



STEEL CEILINGS, ROOFINGS, SIDINGS,

Corrugated Iron, Tin and Terne Plates, Eaves Troughs, Conductor Pipes, Rain Water Cutoffs, Galvanized and Black Sheets.

Ceiling catalogue No. 170. Roofing catalogue No. D 169.

WHEELING CORRUGATING CO.,

Office and Works, Wheeling, W. Va.
Office and Warehouse, No. 474 Latlin Street, Chicago.
Office and Warehouse, No. 81 Fulton Street, New York.
Office and Warehouse cor. 12th & Poplar Sts. St. Louis.

Special Discounts To The Trade.

Paint Free.

We want every tinner and user of Metallic Paint to test our No. 40 Bright Oxide, and on request will send one free of charge. It does not contain any petroleum, fish or other inferior oil, but is ground in strictly pure Linseed Oil and nothing else. Is entirely free from grit; does not cut brushes, or settle in cans when mixed ready for use; has brilliant color and great covering power. For tinners' use it is undoubtedly the best and most satisfactory paint made; is really no higher in price than the ordinary paints, as its superior spreading qualities and no loss from sediment or grit make up the difference.

Eagle Paint and Varnish Works,

P. O. Box 156, PITTSBURG, PA.

The Tinplate Decorating Co.

Decorating for Canners, Packers and to the trade.

TIN AND IRON SHOW CARDS.

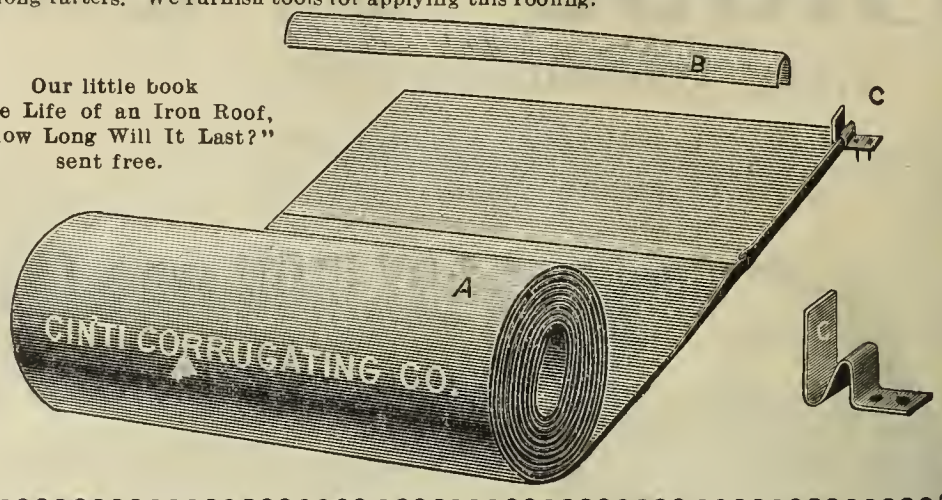
110 John St., - New York.

ROLL AND CAP STEEL ROOFING.

The Cincinnati Corrugating Co.
Box 314, Piqua, O.

IS made from the best soft steel formed into plain rolls 24 in. wide by 50 feet long. It is especially adapted for roofs having a pitch or fall of one or two inches per foot and very long rafters. We furnish tools for applying this roofing.

Our little book "The Life of an Iron Roof, or How Long Will It Last?" sent free.



The New York Iron Roofing and Corrugating Co.

Finest and Largest Variety of Sheet Metals. Products manufactured in the U.S. FIRST & WASHINGTON STS. JERSEY CITY, N.J.



Fine Metal Ceilings.

J. H. ELLER & CO.,

MANUFACTURERS OF

STEEL ROOFING,

Corrugated Iron Roofing and Siding,

Pressed Steel Brick and Rock Face Siding.

GALVANIZED CORNICE, WINDOW CAPS, CRESTINGS, FINIALS, ETC.

GALVANIZED STEEL EAVE TROUGH, CORRUGATED EXPANDING CONDUCTOR, EAVE TROUGH HANGERS, ETC.

Estimates Furnished for Special Designs on Short Notice.

WRITE FOR CATALOGUE AND PRICES.

Office 194 E. Fifth Street, - - - - - Canton, Ohio.

ROANOKE ROOFING AND METAL CORNICE CO,

124 Franklin Road,

ROANOKE, - - - - VA.

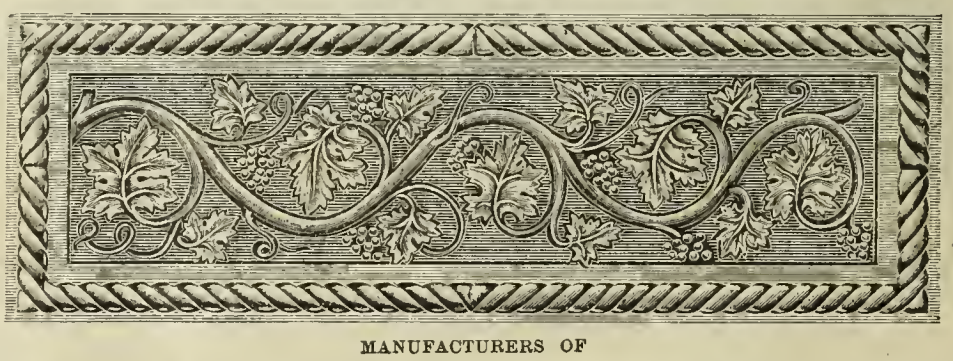
MANUFACTURERS OF

Copper and Galvanized Iron Cornices and METAL TRIMMINGS FOR BUILDINGS.

Send for Catalogue.

Friedley & Voshardt,

194 and 196 Mather St., Chicago, Ill.,



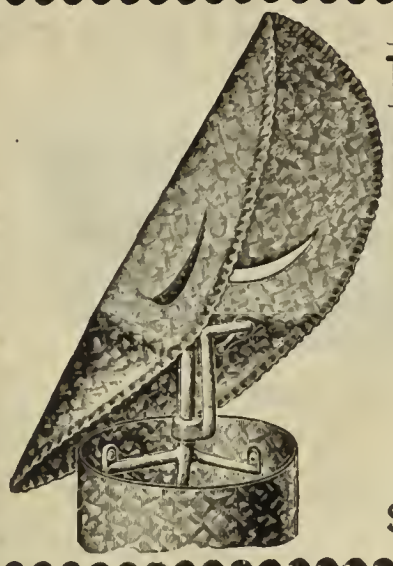
MANUFACTURERS OF

Sheet Metal, Zinc and Copper Ornaments

For Interior and Exterior Work, Steel Ceilings, Statuary, &c.

Send for Catalogue and Prices.

Estimates furnished on Special Work. Send us your Drawings. Orders promptly filled.



THE LUDWICK PATENT CHIMNEY TOP.

Does not choke with soot.

Adjusts with slightest pressure of air.

THE LATEST AND BEST CHIMNEY TOP MADE.

Write for prices and full information.

The Canton Steel Roofing Co.,

Sole Manufacturers, CANTON, OHIO.

PAINT. **PAINT.**

American Seal Ready Mixed Paint

IS THE BEST

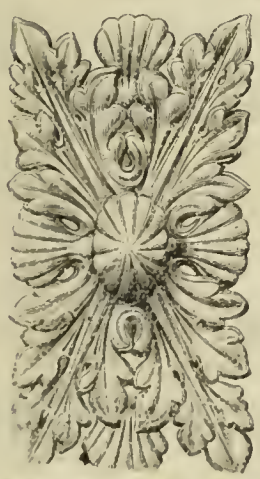
For Painting Wood, Iron, Tin, Stone, Brick, Plaster, or any Surface, Outside or Inside.

It will neither chalk, crack, peel nor blister. Made from pure linseed oil. Every package guaranteed. Write for color cards, prices, etc.

WILLIAM CONNORS, 677 & 679 River Street, Troy, N. Y.

Established in 1852.

Our Appliances for Manufacture,





Our Designs in themselves and our Metal Ornaments as produced, are superior to any others now before the public.

To convince you that we have the finest line of Sheet Metal Ornaments for Cornice Makers' use ever issued, we tender a copy of our catalogue if you will write for it, mentioning this advertisement.

JAMES WHITE,

446 to 456 Adelphi Street, Brooklyn, N. Y.

BUCKLEY, PERKINS & CO.

"PEERLESS" SINGLE LOCK STANDING SEAM } STEEL
"PRESSED" SELF-LOCKING " " } ROOFING.

"PEERLESS" STEEL BRICK SIDING.

"EASTLAKE" METALLIC SHINGLES, CORRUGATED IRON, CONDUCTOR PIPE, EAVES TROUGH ETC.

243 LAKE STREET, CHICAGO.

DUGAN'S PATENT

SNOW GUARDS FOR SLATE AND OTHER SLANTING **ROOFS**

SEND FOR ILLUSTRATED CIRCULAR & PRICE LIST.

M. HALLIDAY,

SOLE PROPRIETOR AND MANUFACTURER.

218 EAST NINTH STREET, NEW YORK.



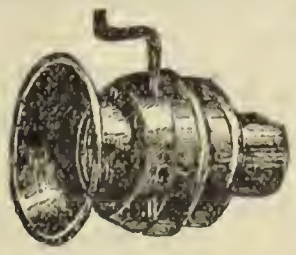
W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.

Manufacturers of

Speaking Tubes, Whistles, Elbows, Oral Annunciators, Bell and Electric Wire Tubing.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.





BERGERS STAR BUCKET EARS

SEND FOR SAMPLE AND FULL ILLUST. CATALOGUE

L.D BERGER

MANUF'R OF

TINNERS HARDWARE AND SUPPLIES.

59 N. 2d STREET, - PHILADELPHIA, PA.

ELBOW CHART

—FOR—

TIN and SHEET IRON WORKERS,

Giving the Rise of the Miter Line of Elbows of any Diameter and Number of Pieces and for any Angle.

This is an easy and practical system of producing elbow patterns for the use of all light or heavy sheet metal workers. It is simple, accurate and most valuable, being the only *thumb* rule ever produced from which accurate results may be expected. Every good workman has some rule by which he may develop a satisfactory pattern for Elbows at right angles, but when something different is wanted, it is a little trouble. By the use of this chart he can safely depend on getting a correct pattern for any elbow, no matter of what diameter, number of pieces or angle, and mark it out direct on his strip of iron or tin, almost as quick as if he had a pattern. This chart has more combinations and measurements than may be counted, and will be a great help to young or old at the business.

PRICE, 50c. BY MAIL.

DAVID WILLIAMS,

PUBLISHER and BOOKSELLER,

96-102 Reade Street, - New York.

THE ROOT & BARRON

ELASTIC ROOF CEMENT.

A roof cement which will not shrink, harden or crack open with age. It is perfectly elastic. It is unequaled for flashing and mending all leaks on tin or sheet iron roofs, troughs, or around chimneys. For sale by the leading wholesale hardware dealers in three, six, twenty five and fifty pound tin cans. Ask them for sample can free or write us.

ADDISON L. ROOT, Manufacturer
PALMYRA, NEW YORK.

SALEM NAIL CO.

O. Nelson, 292 Pearl St., New York

Manufacture every size and kind of Black, Tinned, Galvanized, Copper, Composition, Zinc and Lead

SLATE and TIN ROOFING NAILS

At lower prices than any other house.

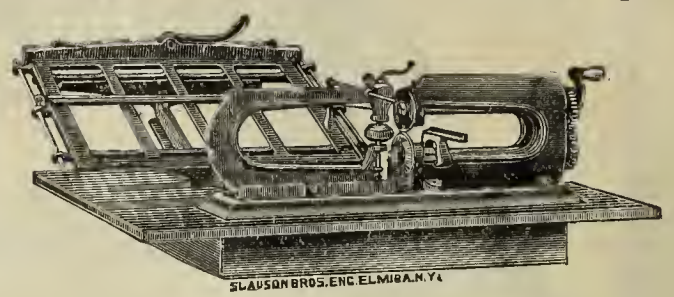
Slaters' Tools, all Kinds

— FACTS.—A teacher having requested each of her class of small boys to bring in three items of information about the Hudson River that they could prove to be facts, received from a bright seven-year-old tho following :

"I have lived neer it. I have saled over it. I have fallun into it. Facks."—*Judge.*

Shears! Shears! Shears!

Clough's Circular Shears will cut XXXX Tin. The Cutters are always set ready for use and kept sharp by their own friction. Made with eccentric lever to set down the clamp plate, and can be rigged with special pasteboard cutters.



ROTARY SLITTING SHEARS.

We sell it separate and at any time can furnish bed plate and arm to complete the Shear. Can be used on the frame of Clough's Cutters.

No. 1 RING AND CIRCULAR SHEAR.

For No. 22 Gauge Sheets and Lighter. Serviceable for cutting internal circles without cutting edge, and a variety of purposes. Will cut circles 3 to 15 inches and rings 3 to 14 inches in diameter.

FLANDER'S CIRCLE SHEARS

will cut blanks at one turn and edge them if supplied with **Edge Turner. Our Latest Improvement** on these shears is the Connection of Cutter Stocks so that the cutters are always set ready for use. **Can be furnished on iron legs.**

We have the above and others in stock. Write for prices and Catalogue to

C. A. CROSBY & CO., 176 & 178 S. CLINTON STREET, CHICAGO, ILL., U. S. A.

DESIGNERS AND BUILDERS OF

Power, Screw, Drop, Hand and Foot Presses, Squaring and Trimming Shears and Special Machinery for Can, Soap Makers', and other lines of goods, including **Lanterns, Oil and Vapor Stoves, Locks, Hinges, Brass Goods and all Hardware Novelties.**

Special Attention to Dies of Every Description.

WORK GUARANTEED THE BEST.

☞ Agents for the Clark Perfection Kerosene Oil System for Heating Soldering Apparatus.

E. J. JOHNSON & Co.,

MINERS AND SHIPPERS OF

ROOFING SLATE.

OFFICE, 38 PARK ROW,

SLATE SLABS OF EVERY DESCRIPTION, BLACKBOARDS, NAILS, TOOLS, FELT, CEMENT, ETC. QUARRIES, BANGOR, PA. NEW YORK.

JOHN GALT. C. H. GALT. WM. R. GALT

JOHN GALT & SONS.

MINERS AND WHOLESALE DEALERS IN

All KINDS of ROOFING SLATE.

253 BROADWAY, ROOMS 805 and 806, NEW YORK.

Prices given delivered at any R. R. Station in the United States.

SLATE

Kitchen Sinks,
Laundry Tubs,
Washstand Tops,
Marbleized Shelves,
Materials of all kinds,

Fairhaven Marble & Marbleized Slate Co.,

In all Forms, also **Mantels.**

FAIRHAVEN, VERMONT.

SEND FOR CATALOGUE.

BANGOR EXCELSIOR SLATE COMPANY,

R. S. BROWN, Proprietor.

Miners and Manufacturers of

GENUINE BANGOR SLATE

Quarries at Bangor, Pa.

MAIN OFFICE, ROOMS 8 AND 9, DRAKE'S BUILDING, - - EASTON, PA.

RISING & NELSON,

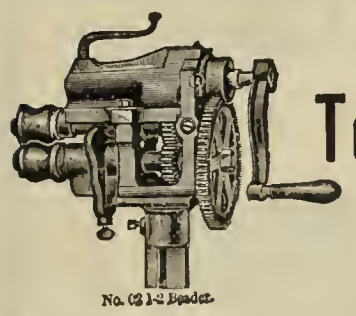
WEST PAWLET, VT.

MANUFACTURERS OF

RED and GREEN ROOFING SLATE.

Wholesale Dealers in all kinds of Roofing Slate.

CORRESPONDENCE SOLICITED.


No. (2 1-2 Beader.

NIAGARA

Tools and Machines for Sheet Metal Workers.

Tinsmiths' Tools,

A FULL LINE.

THE BEST AND MOST IMPROVED

ROOFERS' TOOLS,

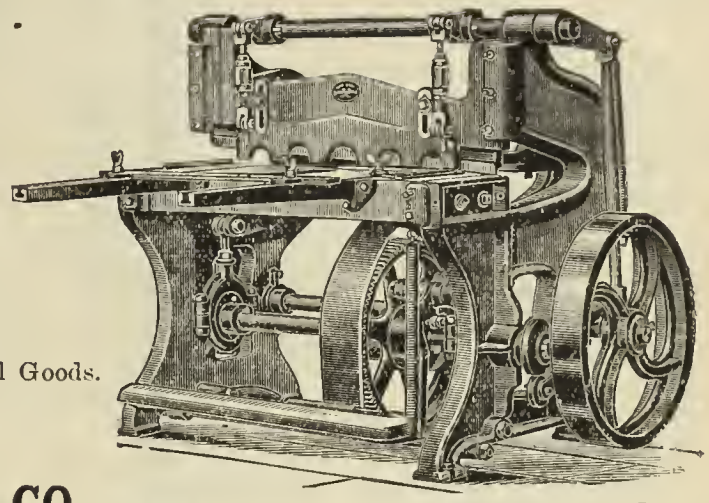
CAN MAKERS' TOOLS,

CORNICE MAKERS' TOOLS.

PRESSES AND DIES.

Squaring, Slitting and Circle Shears.

Complete Outfits for making Tinware, Cans and Other Sheet Metal Goods.


Geared Power Squaring Shear with Gap.

MANUFACTURED BY

THE NIAGARA STAMPING & TOOL CO.,

Correspondence solicited. **BUFFALO, N. Y.**

A FEW SPECIALTIES.

—MADE BY—

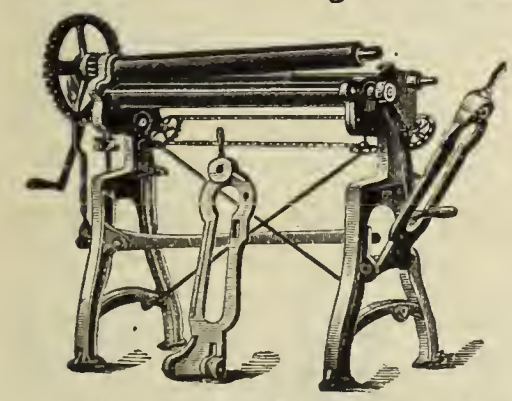
BERTSCH & CO.,

CAMBRIDGE CITY, IND.,

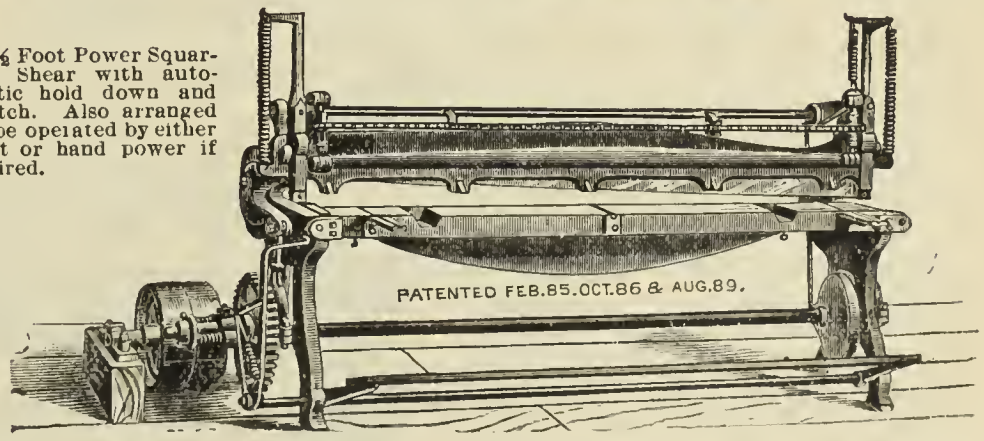
Who would be glad to have you write for Estimates, etc.


Punch and Stock Shear.

Improved Patent Combined General Purpose Punch and Stock Shears. (7) different sizes for light or heavy work for trimming and slitting sheets as desired; also round or flat bars, &c., Provided with two levers, also lever stock shears and lever punches separate, and power punches.


New Patent Self Opening and Closing Quick Adjustable Slip Roll Formers. A revolution in quickness and ease of adjustments, and opening the roll in one operation in elevated position as shown to remove the metal. All sizes, from 2 in. to 12 in. rolls for large plates. Also similar Crimping or Corrugating Rolls, Improved Plate Straightening Rolls, and Tools for working Sheet Metal. Notice this space next week.

8½ Foot Power Squaring Shear with automatic hold down and clutch. Also arranged to be operated by either foot or hand power if desired.





Kenney's Patent Double Seamer

FOR STANDING LOCK

TIN ROOFING.

Improved machine, from new patterns, now ready. Send for prices and flattering testimonials from users.

MANUFACTURED BY

Dwight Slate Machine Co.,

Hartford, Conn.

— "YOUNG MAN, don't you know you ought to lay something by for a rainy day?"

"I do; my rubbers."—*New York Recorder.*

— AN ACCOMMODATING GUIDE.—Guide in the Alps: "Yonder is where the celebrated Marquis d'Uri lost his life by falling into the chasm."

English Tourist (who is accompanied by his daughter): "Why, no; the scene of that accident is two hours' journey from here."

Guide: "Right you are, sir; but I thought it was too far for your daughter to travel."—*Le Petit Journal.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting, and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply

PRICE, POST OR EXPRESS PAID, $5.

ADDRESS ALL ORDERS TO

DAVID WILLIAMS,

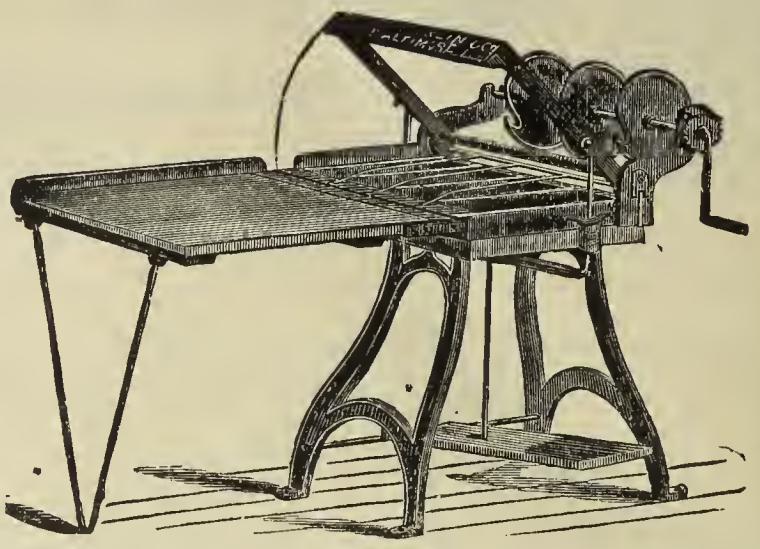
Publisher and Bookseller,

96-102 Reade Street, New York.

Patent Roofing Seamer,

FOR PUTTING TIN TOGETHER.

A BOY CAN WORK IT.



OVER 4,000 IN USE.

CUT OF MACHINE, SHOWING THE DROP TABLE RAISED IN POSITION TO OPERATE.

WE GUARANTEE THIS MACHINE SUPERIOR TO ALL OTHERS MADE FOR THE PURPOSE:

First, for Rapidity of Work.

Second, for Quality of Work.

Third, for Simplicity of Construction and Ease in Operating it.

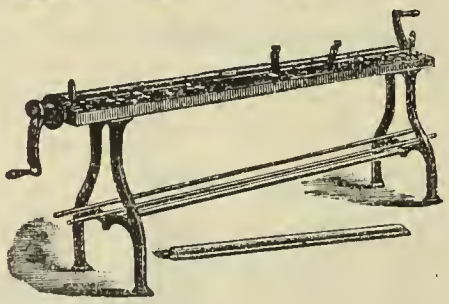
To those undertaking large contracts at close prices, in fact, *to any Roofer who appreciates saving of time and labor,* this machine is indispensable. Send for testimonials, &c., to

LYON, CONKLIN & CO.,

Importers Tin Plates and Metals,

ESTABLISHED 1860. BALTIMORE.

ECLIPSE GUTTER BEADING and FORMING MACHINE.



For Making Galvanized Iron or Tin Gutters. 8 and 10 ft. Long.

Three Mandrels or Rods and Three Formers with each Machine.

The Only Complete Adjustable Machine for this purpose on the market.

Send for our Circular of Testimonials.

ECLIPSE MACHINE CO., TROY, N. Y.

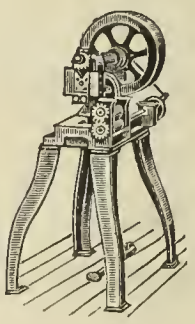
POUCOCK'S ECCENTRIC

FORMING MACHINE.



We invite your attention to this new Former for Tinners' and Sheet-Metal Workers' Rolls, on which we claim rapidity of operation, superior construction and durability. The back roll is moved by eccentrics instead of screws, and can be changed instantly from the small est circle to the passing of a straight sheet. It will flare metal easier and better than any other machine in use. You can get closer to front roll, therefore bend a smaller circle. For sale by all leading jobbers. Send for circular to O. POUCOCK, Mfr. 363, 365, 367 Clark St. CINCINNATI, OHIO. 3-inch Rolls with Slip Rolls a specialty

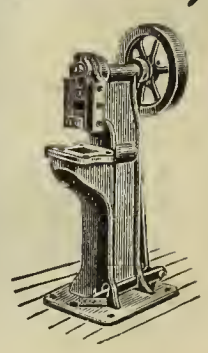
The Toledo Machine & Tool Co.,



MANUFACTURERS OF

Power Punching Presses, Drop Presses, Trimming Presses, Stamping Presses, Riveting Presses, Embossing Presses, Presses with Automatic Feeds, Chain Presses and Machines for working Bar and Sheet Metals. Complete outfits for Can Making.

Send for Catalogue now being Printed.



THE TOLEDO MACHINE & TOOL CO.,

Superior and Oak Sts., Toledo, O.

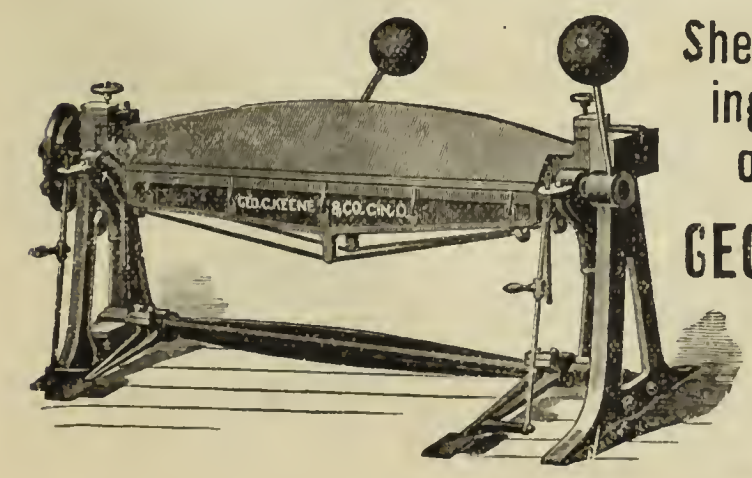
ALPHABETICAL LIST OF ADVERTISERS.

Acme Roofing & Supply Co.. 84
Ætna Standard Iron & Steel Co..... 79
American Boiler Co..... 15
American Radiator Co..... 1
American Roofing Co..... 84
American Sheet Iron Co..... 80
Apollo Iron & Steel Co..... 1
Armstrong Mfg. Co..... 75
Auld & Conger..... 75
Bailey-Farrell Mfg. Co..... 73
Bangor Excelsior Slate Co.. 88
Barstow Stove Co..... 96
Bascom, H. Clay.. 68
Belden, F. E. Mica Mining Co..... 29
Bellaire Stamping Co..... 63
Bell, J. W. & Co..... 82
Berger Bros..... 77
Berger, L. D.....83&87
Berger Mfg. Co..... 76
Bertsch & Co..... 89
Bihh, B. C. Stove Co..... 24
Blessing, C. A..... 70
Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 21
Bowen Mfg. Co..... 27
Bower, B. P. & Co..... 72
Bowers Roofing & Metal Wks 75
Braner, A. G..... 68
Bridgeport Crucible Co..... 60
Bromhacher's Sons, Jacob.. 95
Bruce & Cook..... 82&96
Buckley, Perkins & Co 87
Buffalo Register Works..... 29
Burgess Soldering Furnace Co..... 73
Burton, W. J. & Co..... 84
Calvert, P. B. & Co..... 80
Canfield, H. O..... 72
Canton Steel Roofing Co..... 87
Carton Furnace Co ... 3
Central Oilgas Stove Co..... 9
Central Stamping Co..... 65
Challenge Corn Planter Co.. 26
Chamberlain, J. W. Co..... 71
Cheney, S. & Son..... 27
Chicago & Erie Stove Co..13&16
Cincinnati Corrugating Co. 86
Clark, G. M. & Co..... 7
Clark Novelty Co..... 63
Clark, Quien & Morse 74
Clayton & Lambert Mfg. Co. 70
Cleveland Gas Machine Co.. 71
Clifton Springs Mfg. Co..... 64
Clough, R. M 91
Columbia Refrigerator Co.. 26
Colwell Lead Co..... 78
Connecticut Plating Co..... 69
Connors, Wm..... 87
Cooney, Seiner & Co..... 74
Cope, Geo. W .. 68
Corning Mfg. Co. 24
Correspondence School of Mechanics..... 61
Cortright Metal Roofing Co. 85
Cory, U. & Co... 23
Couch Bros. Mfg. Co.....72
Covert Mfg. Co..... 63
Craig-Reynolds Fdy. Co..... 16
Crosby, G. A. & Co..... 88
Curtis & Curtis..... 71
Dalton-Ingersoll Co... 70
Dangler Stove & Mfg. Co.... 8
Dixon, Jos., Crucible Co..... 83
Douglas, W. & B..... 73
Dover Machine Works..... 91
Dwight Slate Machine Co.... 89
Eagle Paint & Varnish Works 85
Eclipse Machine Co..... 90
Electric Boiler Co..... 24
Eller, J. H. & Co..... 86
Engelhart, Geo. H..... 62
Exeter Machine Works. 1
Fairhaven Marble & Marbleized Slate Co..... 88
Ferrosteel Co..... 14
Follanshee Bros. Co..... 78
Foskett & Bishop Co.. 61
Fostoria Steel Roofing Co... 85
Frink, I. P..... 96
Friedenwald Bros..... 69
Friedley & Voshardt..... 86
Froelich, A., Estate of..... 69
Front Rank Steel Furnace Co 1
Fuller & Warren Co..... 1
Galt, John & Sons..... 88
Garry Iron & Steel Roofing Co 85
Gender & Paeschke Mfg. Co. 67
Giblin & Co 17
Glenmoro Foundry & Machine Co..... 18
Globe Iron Roofing & Corrugating Co 85
Globe Ventilator Co..... 68
Gobeille Pattern Co..... 68
Gobeille, Wm. M..... 68
Gordon, W. J. 94
Gorton & Lidgerwood Co..... 1
Graff & Co..... 16
Greene, W. F 27
Griswold Mfg. Co 65
Gummey, Sperlug & Co .. 79
Gurney Heater Mfg. Co..... 17
Halliday M 87
Hamilton, John..... 96
Hart & Crouse .. . 19
Hartford Hollow Ware Co 63
Harvey, Wm. F..... 77
Haslet, Flanagen & Co... .. 63
Henrie Mfg. Co..... 72
Hess, Snyder & Co..... 25
Highland Foundry Co..... 1
Highton, Wm. & Sons..... 29
Holton Iron Roofing Co..... 84
Howard Furnace Co..... 30
Howard Thermostat Co..... 23
Howson & Howson 62
Illinois Refrigeralor Co..... 26
Illinois Zinc Co 83
Indiana Ladder Co..... 64
Iwan Bros..... 66
Jackson's Sons, W..... 23
Jenkins Bros..... 1
Jersey City Galvanizing Co. 77
Johnson, E. J. & Co 88
Kanneberg Roofing Co..... 76
Kansas City Metal Roofing & Corrugating Co..... 83
Keene, Geo. C. & Co..... 91
Kelly, Thos & Bro..... 70
Kelsey Furnace Co.... 19
Kemp. C M Mfg. Co.... .. 74
Kendrick Valve & Washer Co..... 63
Kernan Furnace Co..... 21
Keuffel & Esser Co..... 63
Kewanee Boiler Co..... 23
Kieckhefer Bros. & Co. 65
Kieley, T ... 1
Kilhourne & Jacobs Mfg. Co. 72
Lambert, Stoughton & Cooper 81
Lawrence-Letts Elbow Co... 73
Lindemann, A. J. & Hoverson Co..... 10
Littleford Bros..... 84
Lufkin Rule Co 94
Lyon, Conklin & Co.... 90
McClure & Co..... 98
McDaniel & Harvey Co. 82
McLaughlin, J. K. 68
Mahony M..... 22
March, Brownhack Stove Co. 28
Marcy Stove Repair Co..... 69
Marlin & Co.. . .. 74
Marston, I. G & Co..... 73
Mason Regulator Co . 1
May & Flebeger 25
Merchant & Co., Inc.... 81
Merry, Geo. E..... 79
Menrer Bros. Co..... 80
Mica Mfg. Co..... 27
Millar, Chas. & Son... ... 96
Miller, Jas. A. & Bro....75,84&85
Miller, Wm. Range & Furnace Co..... 14
Miner & Peck Mfg. Co. 94
Montross Metal Shingle Co.. 84
Mowry, W. C..... 22
Mullins, W. H..... 85
Munsell, E. & Co.. 29
Myers, F. E. & Bro..... 73
National Wringer Co..... 67
Newark Regulator Co..... 69
New Castle Steel & Tin Plate Co..... 81
New York Central Iron Wks. 24
New York Elbow Co..... 63
New York Iron Roofing & Corrugating Co..... 86
New York Nickel Plating & Mfg. Co..... 66
Niagara Stamping & Tool Co. 89
Noble, Chas. & Co..... 12
Obdyke, W. A. & Co..... 74
Obermayer, S. Co..... 69
Ohl, Geo. A. & Co 94
Osborn, J. M. & L. A..... 80
Ostrander, W. R. & Co..... 87
Palermo Mica Co. 29
Pancoast, Henry B. & Co.... 77
Paxson, J. W. & Co 69
Pease, J. F. Furnace Co..... 4
Peck Bros. & Co 71
Peninsular Stove Co.....11
Phelps, Dodge & Co 78
Philadelphia Steel Roofing Co..... 83
Phillips Tin Plate Co... 80
Pocock, O..... 90
Pontyminster Old Style Ternes..... 83
Poorman Mfg. Co..... 95
Portsmouth Stove & Range Co..... 13
Preshrey Stove Lining Co... 68
Putnam Foundry & Machine Co..... 18
Rasner & Dinger 84
Republic Iron Works, ... 81
Rhodes, Dickelman & Co.... 83
Ringen Stove Co..... 2
Risiug & Nelson..... 88
Roanoke Roofing & Metal Cornice Co..... 86
Robinson, J. M & Co 95
Rochester Stamping Wks.... 64
Rome Mfg. Co..... 66
Root, A. L..... 88
Rutland Fire Clay Co. 68
St. Louis Corrugating Co.... 84
St. Louis Stamping Co..... 66
S S. S. Conductor Co..... 75
Salem Nail Co 88
Sanborn, John..... 84
Saunders' D. Sons..... .. 73
Sayre Stamping Co..... 27
Schaffer, J. P..... 23
Schill Bros..... 23
Schneider & Trenkamp Co.. 5
Severding, John..... 75
Shepard, Sidney & Co... ... 62
Sheppard, Isaac A & Co..... 1
Shirk Refrigerator Co..... 26
Silver & Co 66
Sims Mfg. Co. 75
Smith & Winchester Co..... 18
Smith Co., H. B..... 22
Smith, J. D. Foundry Supply Co..... 68
Souther, E. E. Iron Co..... 82
Special Notices.. 61
Sperry, D. R. & Co 66
Standard Lighting Co..... 6
Star Coupler Co..... 15
Star Mfg. Co..... 66
Stebbins, E. Mfg. Co 71
Steel Clad Bath Co. 72
Stellwagen & Kynoch..... 29
Stiles & Parker Press Co 94
Stocking, B. B .. 62
Superior Steel Range Co.... 23
Sykes Iron & Steel Co 85
Syracuse Stove Works..... 20
Taplin, Rice & Co 13
Tarbox Mfg. Co 69
Tatum, S. C. Co..... 62
Taylor Co., N. & G 96
Thatcher Furnace Co. 15
Thorn Shingle & Ornament Co..... 83
Tinplate Decorating Co ... 85
Toledo Machine & Tool Co 90
Troy Nickel Works 19
Troy Oil Stove Co..... 22
Tuttle & Bailey Mfg Co 29
Union Heater & Supply Co.. 72
United States Heater Co.... 22
Valentine, M. D. & Bro. Co. 68
Van Namee, G. L. Mfg. Co.... 27
Van Noorden, E. & Co. 84
Van Range Co., John..... 10
Vedder Pattern Works .. 68
Vogel, William & Bros. 87
Washburne, E. G. & Co..... 68
Wayne, Jos. W..... 27
Weathered's, Thos. W. Sons 17
West, Jas. R..... 64
Wheeling Corrugating Co... 85
White, J..... 87
Whitlock, W..... 73
Wilson, R. M..... 71
Wise, John & Son..... 64
Wister, L. & R. & Co..... 96
WohlerAluminum Co 82
Wood, Alan Co..... 82
Wood Co., W. Dewees..... 96
Yates & Co..... 61
Zero Valve Co..... 73

THE KEENE FOOT POWER

CORNICE BRAKE.

EASIEST TO OPERATE, STRONGEST AND BEST.



Sheet Metal Working Machinery of all Kinds.

GEO. C. KEENE & CO.,

Cincinnati, Ohio.

PRESSES, DIES AND TOOLS

For Can and Tinware Manufacturers.

Dies for Cutting, Drawing & Stamping Tinware

Estimates given at sight of samples of drawing work.

Send Sample for Prices before ordering elsewhere.

DOVER MACHINE WKS, Dover, Del.

HAND LEVER PUNCH.

Operated by Toggle Joint.



Powerful, easy-working, low price. The best yet made. Send for descriptive circulars and price to

R. M. CLOUGH,

TOLLAND, CONN.

CLASSIFIED LIST OF ADVERTISERS.

Aluminum.
Shepard, Sidney & Co., Buffalo, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
White, James, Brooklyn, N. Y.

Basin Plugs.
Canfield, H. O., Bridgeport, Conn.

Bathtubs.
Blessing, C. A., Phila., Pa.
Dalton-Ingersoll Co., Boston, Mass.
Peck Bros. & Co., New Haven, Conn.
Steel Clad Bath Co. of N. Y., 447 West 28th St., N. Y.
Wilson, R. M., Rome, N. Y.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.

Ceilings, Metallic.
Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Roanoke Roofing & Metal Cornice Co., Roanoke, Va.
Wheeling Corrugating Co., Wheeling, W. Va.

Cellar Drainers.
Friedenwald Bros., Baltimore, Md.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Chucks.
National Chucks, 39 Cortlandt St., N. Y.

Coal Hods and Vases.
Central Stamping Co., 23 and 25 Cliff St., N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Silver & Co., Brooklyn, N. Y.

Conductor Pipe and Elbows.
Acme Roofing & Supply Co., Canton, O.
Berger Bros., Philadelphia, Pa.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Cincinnati Corrugating Co., Piqua, Ohio.
Clark, Quien & Morse, Peoria, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Allegheny City, Pa.
Miller, J. A. & Bro., Chicago, Ill.
Obdyke, W. A. & Co., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford, Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Eclipse Machine Co., Troy, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Burton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro., Chicago, Ill.
Roanoke Roofing & Metal Cornice Co., Roanoke, Va.

Couplers.
Star Coupler Co., St. Louis, Mo.

Cream Can Fittings.
Geuder & Paeschke Mfg. Co. Milwaukee, Wis.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.

Dampers.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Sayre Stamping Co., Sayre, Pa.

Damper Regulators.
Poorman Mfg. Co., Canton, Ohio.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.

Drawing Materials.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Drop Hammers.
Miner & Peck Mfg. Co., New Haven, Ct.

Dust Pans.
West, Jas. R., Gas City, Ind.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Canton Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Allegheny City, Pa.
Rhodes, Dickelman & Co., Forest, O.
Sims Mfg. Co., Newark, O.

Eave Trough Hangers.
Acme Roofing & Supply Co., Canton, O.
Bell, J. W. & Co., Mercer, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill.
Rhodes, Dickelman & Co., Forest, O.
Severding, Jno., Richmond, Ind.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Foundry Facings Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Craig-Reynolds Foundry Co., Dayton Ohio.
Foskett & Bisbop Co., 114 Liberty St., N. Y.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Gibiln & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massliion, Obio.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
May & Flebeger, Akron, Ohio.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Peninsular Stove Co., Detroit, Micb.
Portsmouth Stove & Range Co., Portsmoutb, O.
Schili Bros., Crestline, Oblo.
Sheppard, Isaac A. & Co., Phila., Pa.
Tbatcher Furnace Co., 240 Water St., N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Micb.
Couch Bros. Mfg. Co., Dayton, Ohio.
Henrie Mfg. Co., Xenia, Ohlo.
Union Heater Supply Co., Detroit, Mich.

Gas Heaters—*See Stoves and Ranges, Gas.*

Gas Machines.
Cleveland Gas Machine Co., Cleveland Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Fuller & Warren Co., Troy, N. Y.
Jackson, W., Sons, 246 Front St., N. Y.
March-Brownback Stove Co., Pottstown, Pa.

Handles and Knobs.
Haslet, Flanagan & Co., Phila., Pa.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Syracuse, N.Y.
Poorman Mfg. Co., Canton, Obio.

Heaters, Steam and Hot Water.
American Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Exeter Mcb. Works, Boston, Mass.
Foskett & Bisbop Co., 114 Liberty St., N. Y.
Fuller & Warren Co., Troy, N. Y.
Glenmore Foundry & Mch. Co., Phila., Pa.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kewanee Boiler Co., Kewanee, Ill.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Smith Co., H. B., 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass.
Thatcher Furnace Co., 240 Water St, N. Y.
United States Heater Co., Detroit, Mich.
Weathered's, Thos. W. Sons, 139-143 Centre Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Shepard, Sidney & Co., Buffalo, N. Y.
Silver & Co., Brooklyn, N. Y.
Wohler Aluminum Co., Chicago, Ill.

Hose Menders.
Clayton & Lambert Mfg. Co., Ypsilanti, Micb.

Ice Cream Freezers.
Tatum, S. C. Co., Cincinnati, Ohio.

Iron, Galvanized Sheet.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelpbia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
American Sheet Iron Co., Phillipsburg, N. J.
Apollo Iron & Steel Co., Pittsburgb, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cincinnati Corrugating Co., Piqua Ohio.
Follansbee Bros. Co., Pittsburgb, Pa.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelpbia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Ladders.
Indiana Ladder Co., Indiana, Pa.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic*).

Metals.
Sanborn, J., 217 Water St., N. Y.

Mica.
Beiden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.

Mica Canopies.
Mica Mfg. Co., 88 Fulton St., N. Y.

Molding Sand.
Obermayer, S. & Co., Cincinnati, Obio.
Smitb, J. D. Foundry Supply Co., Cincinnati, Ohio.

Nickel Plating, &c.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.

Oilers.
Vogel, William & Bros., 37 to 47 South 9th St., Brookiyn, N. Y.

Oil Heaters (*See Stoves and Ranges, Oil, Vapor and Gasoline*).

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Palm Oil.
Lambert, Stougbton & Cooper, Phila., Pa.

Pants Stretcher.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay, Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobelile Pattern Co., Cleveland, Obio.
McLaughlin, John K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelpbia, Pa.

Pig Tin.
Pbelps, Dodge & Co., 11 Cliff St. N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Plating.
Connecticut Plating Co., Phila., Pa.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Plumbers' Slate.
Fairhaven Marble & Marbleized Slate Co., Fairhaven, Vt.

Plumbers' Tools and Supplies.
Bailey-Farrell Mfg. Co., Pittsburgh, Pa.
Blessing, C. A., Phila., Pa.
Bower, B. P. & Co., Cleveland, O.
Canfield, H. O., Bridgeport, Conn.
Chamberlain, J. W. & Co., Bangor, Me.
Clayton & Lambert Mfg. Co., Ypsilanti, Micb.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Newark Regulator Co., Newark, Ohio.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Peck Bros. & Co., New Haven, Conn.
Star Coupler Co., St. Louis, Mo.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Union Heater Supply Co., Detroit, Mich.
Wilson, R. M. Rome, N. Y.
Zero Valve Co., Buffalo, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Post Hole Diggers.
Iwau Bros., Streator, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brookiyn, N. Y.

Presses and Dies.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Pumps, House and Farm.
Douglas, W. & B., Middletown, Conn.
Hess, Snyder & Co., Massillon, O.
Myers, F. E. & Bro., Asbland, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Clough, R. M., Toliand, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam & Hot Water.
American Radiator Co., Chicago, Ill.
Exeter Machine Works, Boston, Mass.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., N. Y.

Refrigerators.
Bower Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co. Grand Haven, Mich.
Columbia Refrigerator Co., Northville, Mich.
Illinois Refrigerator Co., Chicago, Ill.
Shirk Refrigerator Co., Chicago, Ill.
Wayne, Jas. W., Cincinnati, Ohio.

Registers.
Buffalo Register Works, Buffalo, N. Y.
Ferrosteel, Cleveland, O.
Higbton, Wm. & Sons, Boston, Mass.
Tuttle & Bailey Mfg. Co., 83 Beekman Street, New York.

Report Blanks.
Salesmen's Report Book Co., Pottstown, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N. Y.
Silver & Co., Brookiyn, N. Y.
Wise, J. & Son., Butler, O.

Roof Gutters.
Sims Mfg. Co., Newark, O.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Eagle Paint & Varnish Works, Pittsburgh, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel, Corrugated and Plain.
Acme Roofing & Supply Co., Canton O.
American Roofing Co., Cincinnati, O.
Berger Mfg. Co., Canton, O.
Bowers Roofing & Metal Works, Binghamton, N. Y.
Buckley, Perkins & Co., Chicago, Ill.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, O.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kanneberg Roofing Co., Canton, O.
Kansas City Metal Roofing & Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugating Co., St. Louis, Mo.
Soutber, E. E. Iron Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGE 9[illegible].

Sykes Iron & Steel Roofing Co., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Machines.
Dwight Slate Machine Co., Hartford Conn.
Lyon, Conklin & Co., Baltimore, Md.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.
Rising & Nelson, West Pawlet, Vt.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

School of Instruction.
Correspondence School of Mechanics, Scrantou, Pa.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Eclipse Machine Co., Troy, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Buckley, Perkins & Co., Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Sinks.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.

Skylights.
Miller, J. A., & Bro., Chicago, Ill.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.
Clayton & Lambert Mfg. Co., Ypsilanti, Mich.
Couch Bros., Mfg. Co., Dayton, Ohio.
Henrie Mfg. Co., Xenia, Ohio.
Union Heater Supply Co., Detroit, Mich.

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, O.

Steam & Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Mason Regulator Co., Boston, Mass.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Coun.
Yates & Co., Rockford, Ill.

Stove Linings.
Bridgeport Crucible Co., Bridgeport, Conn.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Pattern.
Bascom, H. Clay, Troy, N. Y.
Cope, G. W., Detroit, Mich.
Gobeille, Wm., Cleveland, Ohio.
Gobeille Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Patteru Works, Troy, N. Y.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Froelich, A., Estate of, 289 Pearl St., N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Stellwagen & Kynoch, St. Ignace, Mich.
Van Namee, G. L. Mfg. Co., Gouverneur, N. Y.

Stoves and Ranges.
Bibb, B. C. Stove Co., Baltimore, Md.
Chicago & Erie Stove Co., Erie, Pa.
Ferrosteel Co., Clevelaud, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Highland Foundry Co., Boston, Mass.
Miller, Wm. Range & Fee. Co., Cincinnati, Ohio.
Noble, Chas. & Co., Philadelphia, Pa.
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, Ohio.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Superior Steel Range Co, Cleveland, Ohio.
Syracuse Stove Works, Syracuse, N. Y.
Tapiin, Rice & Co., Akron O.
Thatcher Furnace Co., 240 Water St., N. Y.
Van, John, Range Co., Cincinnati, O.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill.
Lindemann, A. J. & Hoverson Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Central Oilgas Stove Co., Boston, Mass.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, O
Lindemann, A. J. & Hoversou Co., Milwaukee, Wis.
Ringen Stove Co., St. Louis, Mo.
Schneider & Treukamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
Troy Oil Stove Co., Troy, N. Y.

Surveying Instruments.
Keuffel & Esser Co., 127 Fulton St., N.Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., N. Y.
Rochester Stamping Wks, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Pattern Rules.
Lufkiu Rule Co., Saginaw, Mich.

Tin Plate Decorating.
Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Bruce & Cook, 186 to 190 Water St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Hamilton, John, Pittsburgh, Pa.
Harvey, Wm. F., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry, Geo. E., 535 W. 15th St., N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osboru, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Phila. Pa.
Pontymister Old Style Ternes.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Kleckhefer Bros. & Co., Milwaukee, Wis.

Tinware, Anti-Rusting
Clifton Springs Mfg. Co., Clifton Springs, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.

Tools, Machines and Supplies Tinners'.
Acme Roofing & Supply Co., Canton, O.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N.Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, Geo. A. & Co., Newark, N. J.
Stiles & Parker Press Co., Brooklyn, N. Y.

Torches, Plumbers' and Tinners.
Kendrick Valve & Washer Co, Syracuse, N. Y.

Traps and Vents.
Bower, B. P. & Co., Cleveland, O.

Valves.
Jenkins Bros., 71 John St., N. Y.
Mason Regulator Co., Boston, Mass.
Zero Valve Co., Buffalo, N. Y.

Ventilators and Chimney Caps.
Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Jersey City Galvanizing Co., 112 John St., N. Y.
Merchant & Co., Inc., Philadelphia, Pa.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Watering Pots.
Engelhart, Geo. H., Glenville, Ohio.

Wiping Cloth.
Chamberlain, J. W. & Co., Bangor, Me.

Wringers.
National Wringer Co., Canton, Ohio.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 91.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

Published Weekly at the Following Subscription Price:

TO ALL PARTS UNITED STATES, BRITISH AMERICA, AND MEXICO. - - - - - - $1.00 A YEAR.
TO POINTS IN ALL OTHER COUNTRIES, - - - - - - - - - - - 3.00 A YEAR.

RATES OF ADVERTISING:

ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION, - - - - - - -	$1.00	SIX MONTHS, - - - - - - -	$22.10
ONE MONTH (5 Times), - - - - -	5.00	ONE YEAR, - - - - - - - -	40.30
THREE MONTHS, - - - - - - -	12.35		

Rates for larger spaces quoted on application.

DAVID WILLIAMS, Publisher.

96, 98, 100 and 102 Reade Street, NEW YORK. — **59 Dearborn Street, CHICAGO.**

New York (Main Office), - -	96-102 Reade Street, - - - - - - -	JOHN S. KING, General Manager.
Philadelphia, - - - - - -	220 South Fourth Street, - - - - - - -	THOMAS HOBSON, Manager.
Pittsburgh, - - - - - -	Room 509 Hamilton Building, - - - - -	ROBERT A. WALKER, Manager.
Chicago, - - - - - - -	59 Dearborn Street, cor. Randolph, - - - -	J. K. HANES, Business Manager.
Cincinnati, - - - - - -	Rooms 22-24 Pickering Building, - - - -	HENRY SMITH, Manager.
St. Louis, - - - - - -	Bank of Commerce Building, - - - - -	H. H. ROBERTS, Manager.
Boston, - - - - - - -	146 Franklin Street, - - - - - - -	WALTER C. ENGLISH, Manager.
Cleveland, - - - - - - -	312 The Cuyahoga, - - - - - - - -	EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.
AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth Street; Sydney, 3 Wynyard Street.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Metal Worker* through The American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

E. W. BLISS CO.,

16 ADAMS STREET, BROOKLYN, N. Y.

100-104 W. Washington Street, - CHICAGO, ILL.

DUPLEX FOLDING AND SEAMING MACHINE.

THIS machine is designed to facilitate the manufacture of lock-seamed tinware. It obviates the necessity of using a bar-folder for forming the hooks on the body blank before rolling same on the forming machine. Its operation is exceedingly simple and reliable. The blank is first formed in the rolls, then placed in the machine, which forms the two hooks at one stroke and closes them at a second operation. The advantages obtained are:

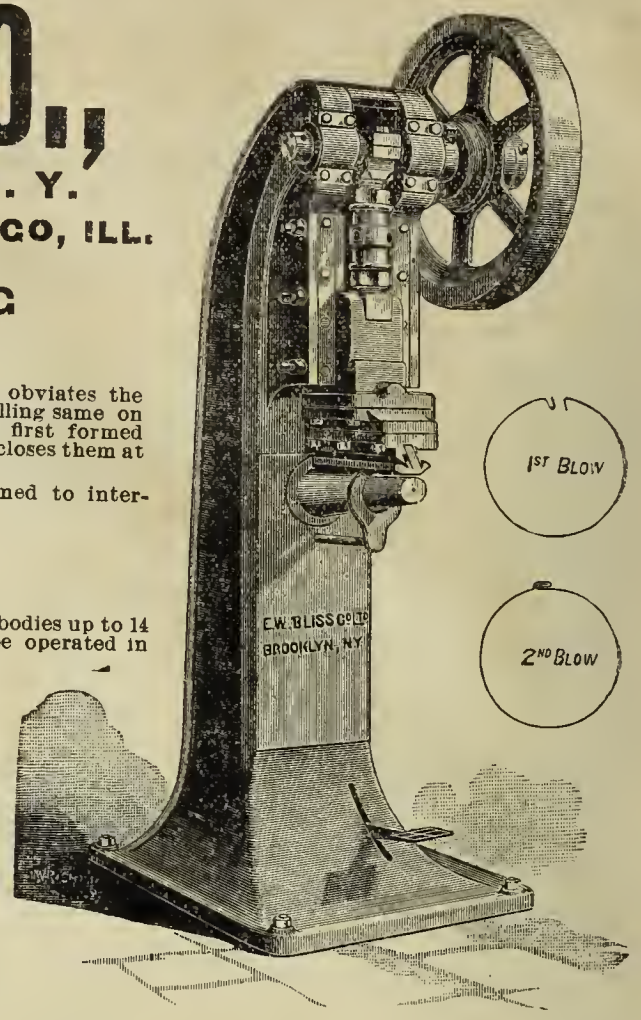
First—That the blank is rolled in the flat, not having any hooks previously formed to interfere with the operation.

Second—That both edges are hooked at one blow.

Third—That the hook forming and closing are done in one handling.

Fourth—That the seam is more uniform than if started in the bar-folder.

The horn can be arranged to throw the seam inside or outside. All sizes of bodies up to 14 inches long can be done on the one horn. These horns and forces are not adapted to be operated in presses having more than ½ inch throw.

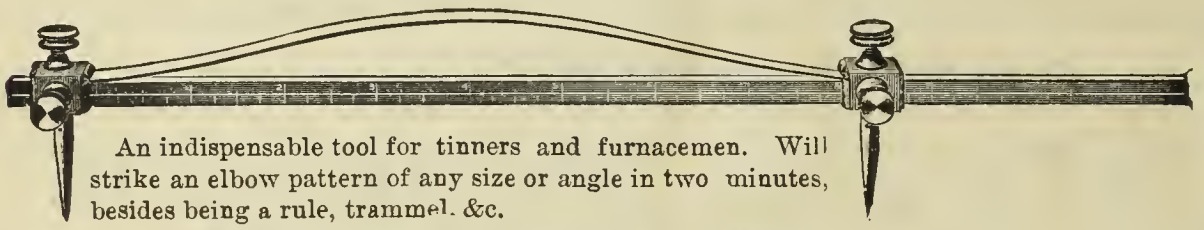


PRESSES, PUNCHES, SHEARS,

DROP HAMMERS,

DIES, SPECIAL MACHINERY &c.

THE STILES & PARKER PRESS CO.



An indispensable tool for tinners and furnacemen. Will strike an elbow pattern of any size or angle in two minutes, besides being a rule, trammel, &c.

"MAGIC" PATTERN RULE.

Price Reduced to $3.50 Net Cash.

Complete with Chart. Will pay for itself in a short time.

Send for Descriptive Circular.

LUFKIN RULE CO.

SAGINAW, MICH.

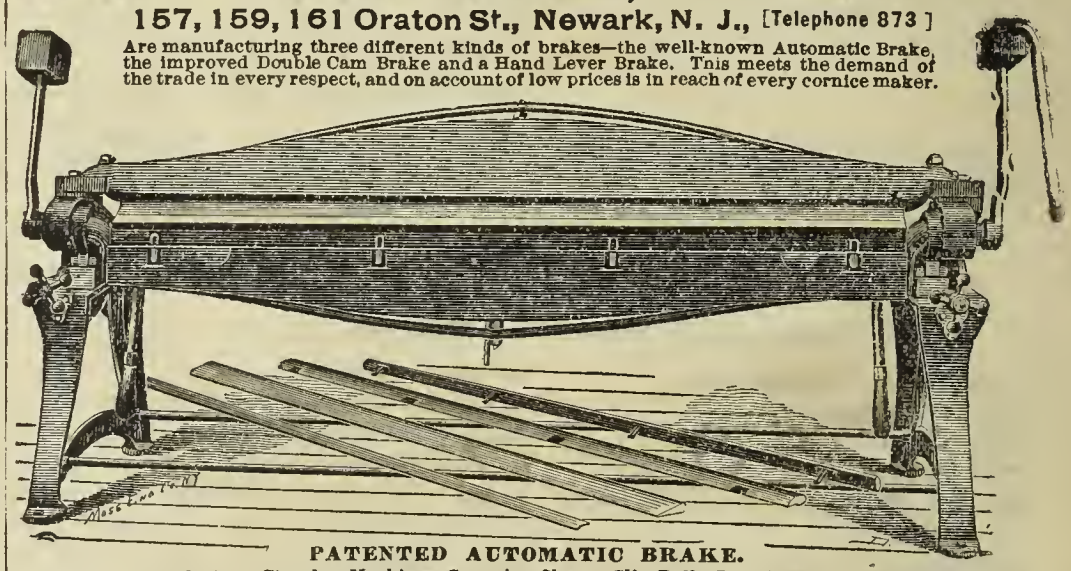
IF YOU WANT ANYTHING IN THE LINE OF
DROP PRESSES · DROP HAMMERS · STAMPS
OR AUTOMATIC DROP LIFTERS.
SEND FOR CATALOGUE
TO
Miner & Peck Mfg. Co.
NEW HAVEN, CONN.
LARGEST LINE IN THE MARKET

GEO. A. OHL & CO.,

Successors to the Calvin Carr Cornice Machine Co.,

157, 159, 161 Oraton St., Newark, N. J., [Telephone 873]

Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a Hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker.



PATENTED AUTOMATIC BRAKE.

We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines, patented December 27th, 1892 Send for our illustrated catalogue.

PATENT AUTOMATIC CAN BODY

SEAMERS.

COMBINATION

Presses and Dies,

SHEET METAL TOOLS, &c.,

218 New St.,

W. J. GORDON, PHILADELPHIA, PA

— A STREET CAR TRAGEDY.— They had mutual friends, and that fact emboldened him to speak without the ceremony of an introduction.

"Sloppy, isn't it?" he remarked persuasively.

"Rather," she replied.

A freezing silence followed, but he had no intention of letting the opportunity slip.

"You wear a vewy lorg hatpin, do you know?" he said. "Weally, the end reaches out quite far."

"Yes, it's quite a protection."

"But it's all rusty."

"That isn't rust."

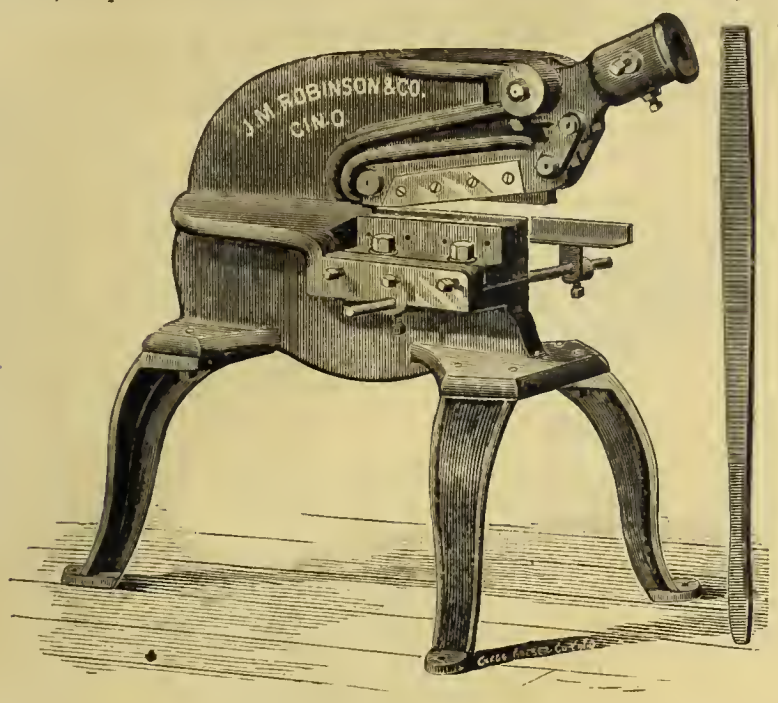
"No? How vewy queer!"

"It is the blood of chappies who have spoken to me in the street car without an introduction."

"That fellow must have forgotten something," said the conductor as the chappie bounced from the car without asking him to stop.

A Good Mechanic with Poor Tools

is very much like a poor mechanic with good tools—neither produce the best results. Every business, however, requires the best that can be obtained in the way of tools and machinery. For sheet metal working of any kind we are producing a line of machinery that for general excellence is unsurpassed. When in need of any machinery for the purpose, we would be glad to show you what we have. It won't cost you anything to investigate. Our place of business is at the S. E. cor. of Second St. and Central Avenue, Cincinnati, Ohio.



J. M. ROBINSON & CO.

THIS ADVT. IS CHANGED WEEKLY.

The "Globe" Cornice Brake.





All set up ready to use. Price, $30.00. Freight allowed to points as far West as Missouri River, and as far South as Galveston, Tex.

FOR SALE BY

Hall & Carpenier, Philadelphia, Pa.
Austin & Doten, Boston, Mass.,
Hackett Hdw. Co, St. Paul, Minn.
and jobbers generally.

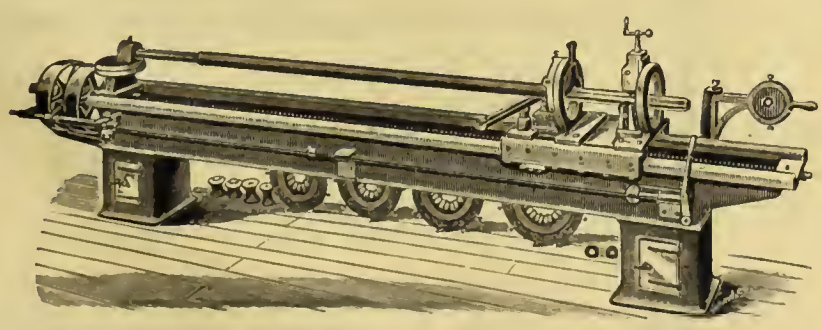
If your jobber can't supply you, order direct of the manufacturers.

SEND FOR CATALOGUE.

Above cut represents the best designed and easiest working 30 inch Shear on the market. Take no other. Warranted to cut No. 20 Iron.

JACOB BROMBACHER'S SONS - No. 30 Cliff St., N. Y. City.
Established 1833. Incorporated 1887.

Ten foot Corrugated and Plain Round Conductor Pipe, Square Corrugated Conductor Pipe, and Ridge Roll Machine.



Also New and Improved Machinery for Manufacturing Metal Roofing.

WRITE FOR CIRCULAR AND INFORMATION.

THE POORMAN M'F'G CO., - Canton, Ohio.

The Laws of Business

FOR ALL THE

States and Territories of the Union.

By THEOPHILUS PARSONS, LL.D.

864 pages, 6 x 9 inches; full leather, **$4.50.**

Contains information of the highest value to business men, treating fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers, hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

Sent, post-paid, on receipt of price, by

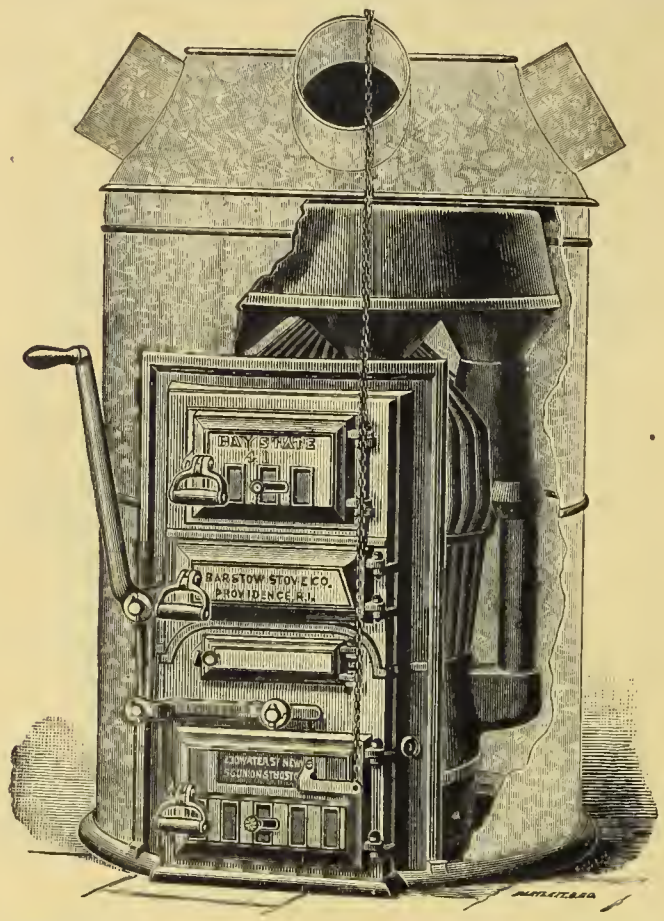
DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade Street, New York.

THE CELEBRATED

"Bay State" Furnace.

All Cast Iron, with Self-Cleaning Flues.
Adapted for Hard or Soft Coal.



Why not get our prices and send for descriptive circular?

BARSTOW STOVE COMPANY,

INCORPORATED,

BOSTON. PROVIDENCE, R. I. NEW YORK.

Look Out For Acid Flux

IN THE SEAMS OF CONTINUOUS ROOFING TIN.

★

We have found it in all that we have tested of **makes other than our own.**

Acid is the **greatest enemy** of Roofing Tin, because it eats through the iron.

There is a very simple but reliable plan for detecting the presence of acid which we will furnish upon application.

The seams in *Our* CONTINUOUS ROOFING TIN are absolutely free from acid, **because there is none used.**

★

N. & G. TAYLOR CO.,

PHILADELPHIA,

Originated and Introduced

Continuous Roofing Tin 26 years ago.

ESTABLISHED 1810.
86th YEAR.

ESTAB. 1857.



The Great CHURCH LIGHT.
Friuk's Patent Reflectors for Gas, Oil or Electric, give the most **powerful, softest, cheapest** and **best** light known for Churches, Stores, Banks, Theatres, Depots, &c. New and elegant designs. Send size of room. Get circular and estimate. A liberal discount to churches and the trade. *Don't be deceived by cheap imitations.* **I. P. FRINK,**
551 Pearl St., N. Y.

L. & R. WISTER & CO.,

257 So. 4th St., Philadelphia.

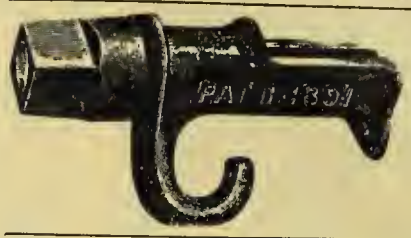
Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Tuscarawas (Black Band).
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK,

TINNERS' TOOLS and MACHINES, TINNERS' SUPPLIES.

186, 188 & 190 Water Street, and 248 & 250 Pearl Street,
NEW YORK.



WILLIS SAP SPOUT.

MADE IN ONE PIECE WITH HOOK.

By far the best Spout made. Greatly improved this season. More used every year than all others combined. Sold by leading jobbers everywhere, and to them by

CHARLES MILLAR & SON, Utica, N. Y.

Dealers! Write for Circular of Maple Sugar Supplies.

W. DEWEES WOOD COMPANY.

TRADE  MARK.

MANUFACTURERS OF

PATENT PLANISHED SHEET IRON,

PATENTED:

December 10th, 1878.	March 4th, 1884.	August 31st, 1886.
January 10th, 1882.	April 15th, 1884.	January 1st, 1889.
January 1st, 1884.	June 10th, 1884.	January 17th, 1893.
February 12th, 1884.	January 6th, 1885.	

Guaranteed fully equal, in all respects, to the IMPORTED RUSSIA IRON. Also WOOD'S SMOOTH FINISHED SHEET IRONS and SHEET STEEL of different qualities CLEANED AND FREE FROM DUST.

General Offices and Works, McKEESPORT, PA.
Branch Office, 111 Water St., Pittsburgh, Pa.

HAMILTON'S
BEST REDIPPED AMERICAN ROOFING TIN

IS DIPPED AND REDIPPED by HAND, and is NOT coated by machines through ROLLS like some plates that are lauded so highly by the makers, and the coating on Hamilton's Best Redipped is as heavy on the TOP half of the sheet as it is on the BOTTOM half. You have scales, test it. We can furnish machine coated plates with 20 lbs. of coating to the box of I. C. 20 x 28 at $11.50 per box, fully equal to any of the so-called extra coated plates.

JOHN HAMILTON,

PITTSBURGH, PA.

McCLURE'S REDIPPED
ROOFING TIN.

AMERICAN MADE.

The **durability** of a Roofing Plate is in the amount and quality of Coating and not in the iron.

McCLURE'S REDIPPED

Is the finest and heaviest coated Roofing Plate made; guaranteed to contain **35 lbs. Coating** per 112 sheets.

To reduce the price of a Roofing Plate is simply to reduce the quality and amount of coating, thereby making a much inferior plate.

The high quality of **McClure's Redipped** will always be maintained as it is our desire to make the **finest and heaviest coated** Roofing Plate in the market regardless of any cost.

The best is always the cheapest.

McCLURE & CO., Pittsburgh, Pa.

UNIVERSITY OF ILLINOIS-URBANA

3 0112 072419960